ANNUAL REPORT OF THE TECHNICAL ADVISORY COMMITTEE FOR 2019

Established by Act 133 of the 2001 Adjourned Session

REGARDING OVERSIGHT AND IMPLEMENTATION OF THE

WASTEWATER SYSTEM AND POTABLE WATER SUPPLY RULES

March 10, 2020

Members of the Act 133 Technical Advisory Committee:

Mark Bannon, P.E., Professional Engineer
John Beauchamp, **MWS, CI**, Master Water Specialist
Peter Boemig, P.E., Professional Engineer
Grahame Bradley, PhD., Hydrogeologist/Soil Geologist, Drinking Water and Groundwater Protection Division
Claude Chevalier, Licensed Well Driller
Ernie Christianson, Regional Office Manager, Drinking Water and Groundwater Protection Division
Mary Clark, Indirect Discharge and UIC Program Manager
Craig Heindel, Hydrogeologist
Craig Jewett, P.E., Professional Engineer
Sille Larsen, Senior Water Resources Engineer, Vermont Department of Health
Gunner McCain, Licensed Designer
Rodney Pingree, Section Chief, Drinking Water and Groundwater Protection Division
Stephen Revell, Licensed Designer, Hydrogeologist
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Denise Johnson-Terk, Licensed Designer, Town Official
Roger Thompson, Licensed Designer
Ken White, Licensed Well Driller
Justin Willis, Licensed Designer
Sheri Young, Licensed Designer and Certified Professional Soil Scientist

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January 15, 2020

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Annual Report of the Technical Advisory Committee

Purpose:

The Technical Advisory Committee was created by Act 133 of the 2001 Adjourned Session of the Legislature and incorporated into the Vermont Statutes as Chapter 64, Section 1978(e)(2) which appears as:

The secretary shall seek advice from a technical advisory committee in carrying out the mandate of this subdivision. The governor shall appoint the members of the committee and ensure that there is at least one representative of the following entities on the committee: professional engineers, site technicians, well drillers, hydrogeologists, town officials with jurisdiction over potable water supplies and wastewater systems, water quality specialists, technical staff of the agency of natural resources, and technical staff of the department of health. Administrative support for the advisory committee shall be provided by the secretary of the agency of natural resources.

Section 1978(e)(3) required the preparation and submission to the legislature of an annual report on several topics: the implementation of this Chapter and the rules adopted under this Chapter; the number and type of alternative or innovative systems approved for general use, approved for use as a pilot project, and approved for experimental use; the functional status of alternative or innovative systems approved for use as a pilot project or approved for experimental use; the number of permit applications received during the preceding calendar year; and the number of permit applications denied in the preceding calendar year, together with a summary of the denial. This report is a summary of the work by the Technical Advisory Committee and the recommendations made by the Committee during 2019.

Technical Advisory Committee Members:

Members of the Technical Advisory Committee are recommended by the Secretary of the Agency of Natural Resources and appointed by the Governor. The full list of Technical Advisory Committee Members, and their contact information, is attached as Appendix A.

Executive Committee and Subcommittees:

The TAC has an Executive Committee with three members and three alternates that are available to answer questions or provide testimony to the Agency or the Legislature. There was 1 standing subcommittee during 2019. The list of Subcommittee members is included in Appendix A

Meetings:

Two meetings were held by the TAC in 2019 on July 30 and October 9 at the Annex Building in Berlin. Fifteen members attended each meeting.

The full minutes of each meeting are attached as Appendix C and are available on-line at http://wastewater.vt.gov/wastewaterdisposaltac.htm under the heading "Technical Advisory Committee."

Activities of the Technical Advisory Committee (TAC):

1. **General Comments:** The Technical Advisory Committee was less active in 2019. The changes to the Wastewater System and Potable Water Supply Rules (Rules) were approved by the Legislative Committee on Administrative Rules on March 21, 2019 and became effective on April 12, 2019. After the Rules were effective, the Department of Environmental Conservation (DEC) conducted training sessions at several locations around the State. The DEC collected comments about the Rules and learned that some sections were considered difficult to understand and that there might be some unintended impacts on applicants and designers. The DEC discussed these issues with the TAC and TAC members added more comments based on their own experience with the new Rules. The TAC made several recommendations to the DEC which are documented in the attached minutes of the meetings and the comments below.

2. **Discussion and Recommendations**

   A. **Well Interference** – The language related to determining possible well interference between a proposed new or replacement well and existing wells was revised in the new Rules. The Rules require an analysis of the potential for interference between proposed and existing wells when they are separated by less than distances specified in the Rules. There are proven interference issues between wells located further apart than the distances specified in the Rules. The TAC was concerned that it is unclear if the DEC has authority to require an interference analysis at a greater distance than specified in the Rules even when there is site specific evidence of potential interference. The DEC determined that the existing language in the Rules authorizes a request for an interference analysis when the proposed separation exceeds the distances specified in the Rules if there is site specific information indicating the potential for interference.

   B. **Indirect Discharge Program** – Bryan Harrington made a presentation to the TAC on the status of the Indirect Discharge Program outlining some of the recent changes made to the Indirect Discharge Rules (IDR) and the pre-rule making work he is doing. The IDR were updated with changes effective on April 12, 2019 which coincides with the update to the Rules.

   The definition of an Indirect Discharge is "any discharge to groundwater, whether subsurface, land based or otherwise." A permit is required for any indirect discharge system except for sewage or non-sewage disposal systems with less than 6,500 gpd capacity that are subject to the Wastewater System and Potable

Water Supply Rules, that are exempt from those rules, or are existing indirect discharge systems of non-sewage waste.

There are about 90 systems that were in existence on or before May 17, 1986 with design flows of less than 15,000 GPD. These are subject to a general permit. There are about 45 systems in existence on or before May 17, 1986 with design flows of 15,000 GPD or more and these are subject to individual permits which require some ongoing monitoring. There are also about 50 newer systems that discharge sewage waste and about 25 newer systems that discharge non-sewage waste.

The IDR were updated effective April 12, 2019 which is the same day the new Rules became effective. The revisions clarified that the Wastewater System and Potable Water Supply Rules regulate non-sewage wastewater systems with design flows of less than 6,500 GPD. The revisions also updated some of the general permit requirements. The DEC intends to proceed with a more complete update of the IDR and as the pre-rulemaking process begins the TAC will be informed.

C. Percolation Testing and Soil Description -

The new Rules require the use of descriptions of soil texture and soil structure to determine the application rate of wastewater to the soil. A percolation test may also be performed, but the maximum application rate is controlled by the soil description. When Licensed Designers started working with the new Rules, they encountered sites where the soil description method reduced the maximum application rate in comparison to the previous percolation test method. In some cases, the resulting increase in size of the leachfield made construction difficult or impossible. It was also noted that systems are not permitted in clay soils, regardless of the percolation rate.

The DEC said that the prohibition on clay soils was because the application rates would be so low that systems would not be practical and that clay soils usually have a seasonal high water table at less than 6" which is the minimum for any soil based disposal system, other than a store and dose system (section 1-926 of the Rules). The DEC also reviewed the results of permit application information for projects submitted in the previous year. These applications included a soil description and percolation test results. The DEC noted that the application rate determined by the two methods is usually the same.

The TAC considered the following issues:

1. whether the soil texture and structure categories should be further subdivided;

2. whether percolation tests that allow for an increased loading rate should be allowed as the basis of design;

3. whether the loading rates assigned for either percolation tests or soil descriptions are in some cases too high or too low; and

4. if the apparent difference in results from the percolation test and the soil description methods is caused by inaccurate application of one or both methods.

The consensus of the TAC is not to rely on percolation testing but to maintain the soil analysis approach. The TAC supports use of a sieve analysis to demonstrate that the soil, which is in a category with multiple soil textures, is at the coarser end of the range and therefore should have a higher loading rate.

The DEC does support Vermont based research to determine if the new Rules understate the soil absorption capacity of some Vermont based soils or if there are methods for wastewater treatment/disposal not currently allowed that should be approved. The University of Vermont is a resource that might be able to perform this research.

D. Plan Details and As-Built Plans (Record Drawings) -

The new Rules have more specific details on the information that must be included in the application including construction details such as materials and specific elevation of components. These changes to the Rules were discussed by the TAC during the rule writing process and were intended to result in a set of plans that included all the information a competent installer needs to install the water and wastewater systems. Some TAC members are concerned that the effort to have more detailed plans will require many permittees to file as-built plans as part of the final inspection process. If, for instance, a plan must include an invert elevation for the sewer pipe as it exits the building and the elevation changes, an as-built plan might be required. Because many permits are issued to sellers of property and the buyer wants to make a change in the building location, the sewer pipe elevation often changes. There are many other small changes that can occur during development that do not affect compliance with the environmental and health requirements in the Rules. Preparation of as-built plans adds cost to the project and should be avoided when possible. The DEC will accept designs which demonstrate the project will comply with the Rules using a description of the construction rather than a specific number. The sewer line could be designed with a requirement that it maintain a minimum required slope from the building to the septic tank rather than specifying the invert elevation of the pipe at the building. Some design requirements, such as the bottom elevation of the

leachfield must be specified in order to ensure separation to bedrock and the seasonal high-water table. The DEC will work to minimize the need to file as-built plans.

3. Innovative/Alternative Systems

During 2019, the DEC approved on new Innovative/Alternative System called ClearPod, an aeration and fixed film technology for treating wastewater to filtrate standards, by Island Water Technologies.

APPENDIX A

Technical Advisory Committee Members as of December 1, 2019

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Executive Committee

Steve Revell, Ernest Christianson, Roger Thompson

Alternates – Claude Chevalier, Craig Heindel

Subcommittees:

Hydrogeology

Craig Heindel, Bill Zabiloski, Mark Bannon, Scott Stewart, Steve Revell, Mary Clark, Roger Thompson, Peter Boemig, Ernie Christianson,

Appendix B

Compliance with Performance Standards for Regional Office Permits

Issued During Calendar Years from 2007-2019

	# of Permits Issued	# of Permits Meeting PEP Standards	% of Permits Meeting PEP Standards	Average DEC Days
2007	3746	3691	98.5%	16.8
2008	3435	3418	99.5%	12.3
2009	2691	2672	99.3%	11.8
2010	2621	2600	99.2%	11.9
2011	2289	2279	99.6%	13.2
2012	2472	2444	98.9%	12.7
2013	2449	2400	98.0%	14.0
2014	2503	2417	98.4%	12.6
2015	2367	2299	97.1%	11.8
2016	2647	2491	94.1%	16.2
2017	2253	2128	94.4%	16.7
2018	2527	2318	91.7%	15
2019*	2292	2110	84.0%	22.2

Note: The performance standard for DEC days is 30 days for one-lot subdivisions and projects with a design flow of 500 GPD or less. The performance standard for other projects is 45 days.

* The Program had 2 technical people retire in two offices at the end of 2018 which affected the ability to meet PEP and increased the Average DEC days particularly for the first 6 months of 2019.

Innovative/Alternative Systems

Renewals were issued in 2019 for the following Innovative/Alternative systems.

Company	Technology	Expiration Date
Bio-Mcrobics, Inc.	**Microfast®, RetroFAST®, HighStrength®**	**01/20/2020**
Hydro-Action Manufacturing	**Hydro-Action® Class 1 Wastewater Treatment System AP Series**	**2/22/2021**
FujiClean USA	**FujiClean CE Series**	**03/29/2021**
Hydro-Action	**Hydro-Action AP Series**	**02/22/2021**
Jet Inc.	**Jet BAT Media Series**	**06/30/2020**
Norweco	**Singulair Series** **Hydro-Kinetic**	**01/25/2020**
Presby Environmental	**Simple Septic** **Enviro-Septic** **Advanced Enviro-Septic**	**02/23/2021**

Innovative/Alternative (I/A) Wastewater System Summary 2007 to 2019

Year	Overall Number of I/A Systems Permitted
2007	137
2008	796
2009	538
2010	457
2011	424
2012	513
2013	521
2014	612
2015	594
2016	526
2017	545
2018	561
2019	536
Total	**6199**

Innovative/Alternative Permits in 2019

I/A Manufacturer	Number of General Use I/A Products Permitted (excluding dispersal products)	Number of General Use I/A Dispersal Products	I/A Pilot use Systems Permitted	I/A Experimental Use systems Permitted
Advanced Aeration Group	0			
Advanced OnSite Solutions	5			
American Manufacturing		8		
Anua	0			
Aqua Test Nibbler - Pilot	1		0	
Aquapoint 3	0			
Bio-Microbics	9			
Cromaglass (not in business)	0			
Delta Environmental Products	0			
Ecological Tanks	0			
Eljen Corp		1		
FujiClean	0			
Hydro-Action	5			
Infiltrator Systems		91		
Jet	24			
Norweco	22			
Orenco	26			
Premier Tech	28			
Presby Environmental		313		
SeptiTech	3			
Pilot Use Systems	0	0		
Experimental Use Systems	0	0		
Total	123	413	0	0

Innovative/Alternative (I/A) System Inspection Reports Received
An Approved System Requires an Inspection Each Year

Year	I/A Reports Received
2012	52
2013	693
2014	891
2015	914
2016	960
2017	1040
2018	1037
2019	1013

Licensed Designer Program Education Opportunities

	DEC Sponsored Training		DEC Endorsed Soil Classes	DEC Endorsed Non-Soil Classes
	Classes	Attendees		
2010	5	120		
2011	4	110		
2012	7	215*		
2013	12	273*		
2014	12	173*		
2015	13	222		
2016	5	200*	20	36
2017	4	159*	16	20
2018	5	110	12	17
2019	12	186	12	23

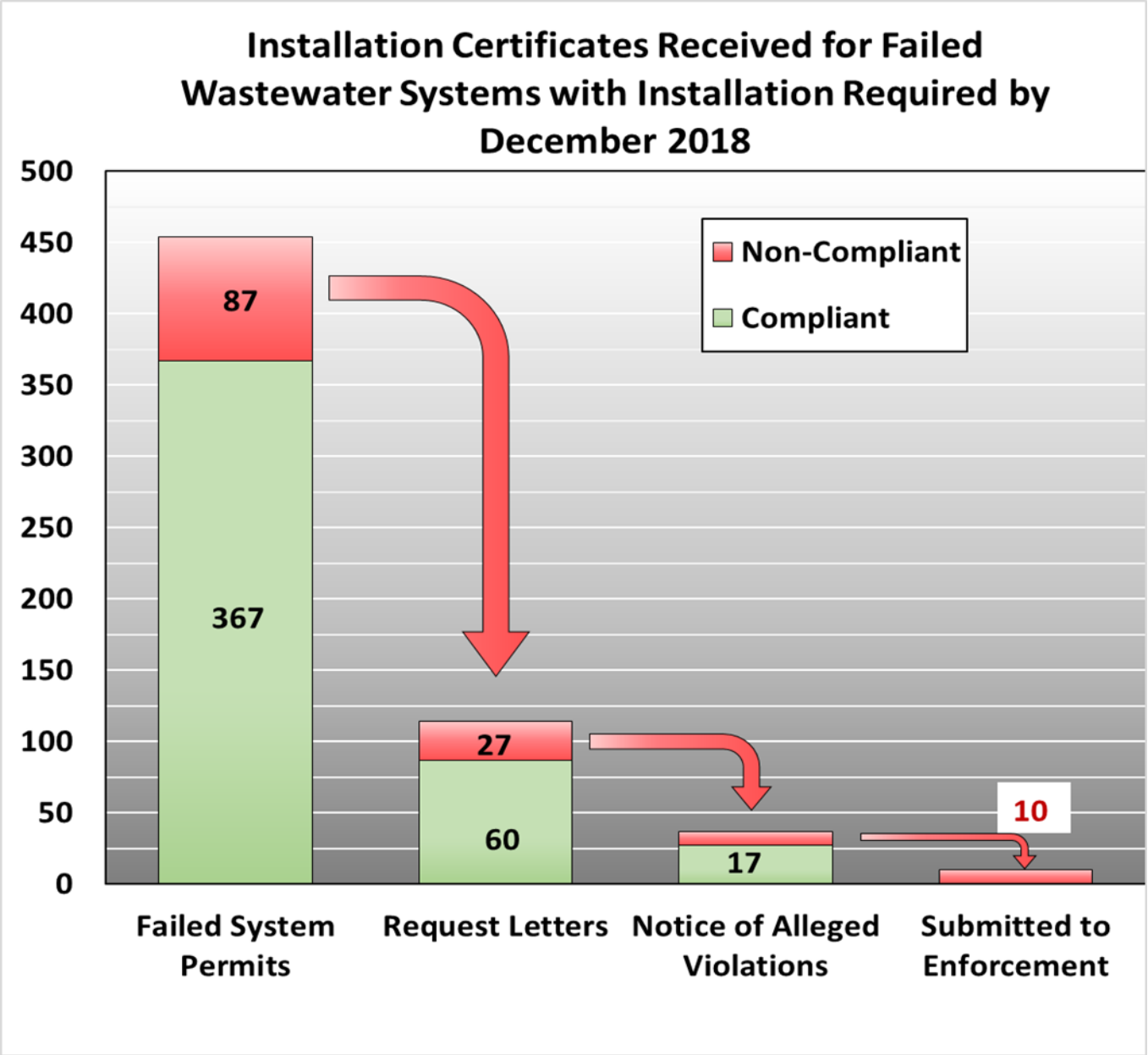
* estimated

Permit Information for 2019

Permits Issued to Repair Failed Wastewater Systems	Applications Denied
515	2

* Reasons for denials: Denials are issued for applications that are incomplete or fail to demonstrate compliance with the Wastewater System and Potable Water Supply Rules when submitted.

Failed Wastewater Systems Compliance Initiative



Low Income Loan Program

During calendar year 2019, the On-Site Loan Program made six loan awards for a total of $151,716.64 in new loan commitments. Two of the loans were for replacement of failed water supplies; the other four loans were for replacement of failed wastewater systems.

The program partners with the Opportunities Credit Union to underwrite and service the loans made under this program.

Appendix C

Approved Minutes of the Technical Advisory Committee Meeting
July 30, 2019

Attendees:	Roger Thompson	Carl Fuller
	Rodney Pingree	Denise Johnson-Terk
	Gunner McCain	Justin Willis
	Steve Revell	Graham Bradley
	Cristin Ashmankas	Rich Wilson
	Craig Jewett	Bryan Harrington
	Mark Bannon	Sheri Young
	Ernest Christianson	

Scheduled meetings:

October 3, 2019	1-4 PM	The Annex Building

Department of Environmental Conservation Staff Changes:

Mary Clark is retiring from the Indirect Discharge Program

Cristin Ashmankas will join Ernie at the central office in the Regional Office Program.

Allison Lowry is the new Assistant Regional Engineer in Essex.

Technical Advisory Committee Member Changes:

Peter Boemig asked to not be reappointed now that he is moving into full retirement.

Craig Jewett, Professional Engineer, and Sheri Young, Licensed Designer and Certified Professional Soil Scientist will join the TAC.

Indirect Discharge Program Pre-Rule Making:

Bryan outlined some information about the Indirect Discharge Program. There are about 90 older systems (existing on or before May 17, 1986) with design flows of less than 15,000 GPD which are subject to a general permit. There are also about 45 older systems with design flows of 15,000

GPD or more that are subject to individual permits with some monitoring conditions. There are about 50 newer systems that discharge sewage waste and about 25 newer systems that discharge non-sewage waste. The Indirect Discharge Rules (IDR) were recently updated and were effective on April 12, 2019. This update was done in association with the update to the Wastewater System and Potable Water Supply Rules (WW Rules) that were also effective on April 12, 2019. The IDR update clarified that the WW Rules regulate non-sewage wastewater systems with a design flow of less than 6,500 GPD and made some updates to the general permit requirements. Bryan said they are in the very early stages of doing a more general update of the IDR rules and have yet to begin public outreach work. He will keep the TAC posted when the process moves forward.

Innovative/Alternative Systems:

Graham said that the Geomatrix GeoMat Flat™ and GST™ systems are under review. As the review proceeds the TAC will have a chance to comment.

Discussion of WW RULES:

Several TAC members asked questions about the difference in leachfield sizing when using the soil description method or the percolation test method. The WW Rules allow for percolation testing but also require use of the soil description method. If the soil description method results in a more conservative loading rate, it must be used for the design. There are some soil categories that have a large range of reported percolation rates. The group discussed the variability in percolation testing including how well the saturation portion of the test is done and the time of year when the testing is done. There are concerns that the new WW Rules may restrict development when larger systems are required because the percolation test is superseded by the soil description requirement.

The questions discussed included:

1. whether the soil texture and structure categories should be further subdivided

2. whether percolation tests that allow for an increased loading rate should be allowed as the basis of design

3. whether the loading rates assigned for either percolation tests or soil descriptions are in some cases too high or too low

4. if the apparent difference in results from the percolation test and the soil description methods is caused by inaccurate application of one or both methods

The general consensus of the TAC is not to rely on percolation testing but to maintain the scientific approach by allowing a designer to conduct sieve analysis to demonstrate that the soil, which is in a particular category with multiple soil textures, is at the coarser end of the range and therefor should have a higher loading rate.

Ernie and Grahame will do further research into how other states deal with the loading rate issues. The TAC will continue this discussion at the next meeting.

Steve asked about the requirement that invert elevations be shown for the wastewater piping and distribution system. He noted that in many cases the application is filed to get approval for a lot long before a specific building is proposed for the lot. There are also concerns about how much variation from the approved plan is allowed before an as-built plan and certification is needed. Ernie explained that the TAC had discussed this issue during the process of updating the WW Rules and supported the existing language. Mark noted that the goal is to have a set of approved plans with all the details needed for a competent installer to complete the installation. Ernie thinks that a compromise would be to not require an as-built plan when the system as installed in accord with the design relative to basic requirements such as location, slope, or depth to SHWT even if the invert elevations differed from the approved plan. Sites where some or all the elevations need to be exact in order to comply with the design standards would have invert elevations for the critical areas such as the bottom of the infiltrative area relative to SHWT and bedrock. This topic should be discussed further at the next meeting.

Approved Minutes of the Technical Advisory Committee Meeting
October 9, 2019

Attendees:

Roger Thompson
Graham Bradley
Nathan Kie
Sheri B. Young
Gunner McCain
Ernest Christianson
Rich Wilson
John Beauchamp
Scott Stewart
Bryan Harrington
Denise Johnson-Terk
Justin Willis
Steve Revell
Sille Larsen
Cristin Ashmankas

Scheduled meetings:

November 12, 2019 1-4 PM The Annex Building

Minutes: There were no comments about the draft minutes of the July 30, 2019 meeting.

Comments about the new Wastewater System and Potable Water Supply Rules (Rules)

Ernie said that he has received some comments that the new Rules are hard to understand and excessively wordy. Ernie explained that in trying to ensure that each section of the Rules is legally enforceable some sections are hard to follow even though in most cases the technical standards have not changed. Ernie and the TAC agreed that the difficult to understand sections should be reviewed and revised to eliminate confusion. Sections 1-903 and 1-802(e)(2)(A) were flagged for review. Gunner asked why a 4" limitation was added to section 1-802(e)(2)(A). This section allows for a variance when doing a replacement wastewater system for a pre-existing use when the cost of greater compliance is large compared to the increased health and environmental protection. Ernie said he wanted to define the maximum variance so that designers will not ask for unreasonable variances.

Interference Testing of Wells: Ernie said that Scott had flagged an issue about testing for well interference based on an existing situation. The question is whether the Rules should allow for a request for information about interference with existing wells that are located at distances greater than those specified in Table 11-4 of the Rules. Ernie thinks that §1-1108(b) of the Rules does allow for request for this information when there is evidence of potential interference. The TAC consensus is that when there is site specific evidence that unacceptable well interference may occur at a distance greater, the Rules should allow for a request for information for wells located at distances greater than specified in Table 11-4. Ernie will ask for legal advice on whether the existing Rules allow for such a request or if a Rule revision is needed.

Soil Description Versus Percolation Testing: The TAC continued this discussion from the previous meeting. Sherri again noted that there are large areas in Addison County that are clay soils which under the soil description method are not acceptable while in some cases they might pass the percolation test method with a percolation rate of 120 minutes per inch or less. The Rules require use of the more restrictive results of the percolation test or soil description method. Graham commented that treatment and flow can be separate issues and, if the flow is mostly related to the soil structure, less treatment may occur than expected. Cristin said that the numbers in the Rules match work done in North Carolina used to determine the long-term acceptance rate of wastewater on clay soils. Sheri suggested that some work should be done in Vermont because the clay in Vermont is somewhat different than in North Carolina. The University of Vermont has a

soil science program and perhaps they could do some investigation of the topic in consideration of the widespread clay soil limitations in Addison County and other locations in Vermont. Cristin agreed with Sherri and suggested that the DEC should look for money to do some studies.

Innovative/Alternative Systems: Graham is reviewing an application from Geomatrix Systems, L.L.C. for use of their GeoMat™ Flat system in Vermont. The application covers many permutations, each of which would need a detailed presentation for use in Vermont. Graham will discuss this with the applicant and determine if a more focused application for use in Vermont may be appropriate. When the information is complete Graham will ask for TAC comments.

Meeting Date: The next TAC meeting will be from 1-4 PM on November 12, 2019. The meeting will be at the Annex.