

**ANNUAL REPORT OF THE
TECHNICAL ADVISORY COMMITTEE
FOR 2017**

Established by Act 133 of the 2001 Adjourned Session

REGARDING OVERSIGHT AND IMPLEMENTATION OF THE

**WASTEWATER SYSTEM AND POTABLE WATER SUPPLY
RULES**

January 15, 2018

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Mary Clark, Drinking Water and Groundwater Protection Division

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Roger Thompson, Licensed Designer

Ken White, Licensed Well Driller

Justin Willis, Licensed Designer

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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 2017.

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 were also 4 standing subcommittees during 2017. The list of Subcommittees and members is included in Appendix A. In addition, special subcommittees were appointed to address a specific topic such as review of a particular advanced treatment system. The members of these subcommittees are included in the monthly minutes of the Technical Advisory Committee which are available online at <http://wastewater.vt.gov/wastewaterdisposalac.htm> under the heading "Technical Advisory Committee."

Meetings:

Six meetings were held by the TAC in 2017 on January 10, March 21, April 4, April 18, April 25, and May 9.

The meetings were held in conference rooms at the National Life Building and at the DEC Annex Building in Montpelier. Meeting attendance ranged from 10 to 17 with an average attendance of 14 people.

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 and the Department of Environmental Conservation (DEC) continued to be active during 2017. The primary focus was on reviewing the proposed updates to the Wastewater System and Potable Water Supply Rules.
2. **Proposed Wastewater System and Potable Water Supply Rule (WW Rules) Revisions:** The Department of Environmental Conservation (DEC) continued its drafting process while undergoing an extensive legal review process to bring the formatting into compliance with DEC standards that have been updated since the last rule update in 2007. While waiting on the conclusion of this work the TAC discussed the following topics:
 - A. The design flows for wastewater and water in the existing WW Rules are different. The wastewater design flows have been reduced over the years and large reductions in wastewater flows are now allowed for projects with several single-family residences connected to a single wastewater disposal system. The differences in design flow are justified for two reasons. In many cases a significant amount of water is used for car washing, gardening, and other uses where the used water is not discharged to the wastewater disposal system. In addition, a wastewater system can tolerate occasional discharges that exceed its design flow without any failure whereas a demand on a water system that exceeds its design capacity may result in an immediate lack of water. After due consideration, the Water Supply Section proposed to reduce the design flow for water to 360 gallons per day per single family residence when five or more single family residences are connected to the same water supply system. This design flow would be used regardless of the number of bedrooms in the single-family residences. Census numbers in Vermont for average occupancy in a single-family residence indicate a small chance that five or more units would all be occupied at high levels, even if the individual residences have large numbers of bedrooms. The majority of the TAC members support the proposed design flows.

- B. The TAC asked if a process could be created that would allow use of some Innovative/Alternative (I/A) technologies without needing a site-specific approval for that use. There are some passive technologies with well proven performance that have design manuals which when used in conjunction with the design requirements in the WW Rules do not require a site-specific evaluation. When, in addition, the technology does not require any inspection or maintenance, the additional cost of a site-specific approval is not justified. The DEC agrees with this and will work to eliminate the need for the separate I/A approval.
- C. The TAC asked about adding advanced treatment systems to existing systems to extend their life without doing a full upgrade such as adding pressure distribution. One question is if such an addition should require a permit. Another is whether there are any minimum site conditions, such as separation to the seasonal high water table or to a water source, that should be met. The TAC supports the issuance of a permit with appropriate conditions. After reviewing an application for a specific technology, the DEC decided that a permit would be required and that the existing wastewater system would be required to meet the technical standards in the WW Rules.
- D. The accessibility of permitting information online was discussed. The Regional Office information, particularly with the new requirement for electronic applications, seems to be readily available for public viewing. The information from towns that have received delegation authority is not posted on the same web site and is sometimes hard to locate. The TAC suggested that town information be added to the DEC site.
- E. One member of the TAC noted that the Department of Public Safety had updated the Plumbing Rules. The update appeared to create a conflict with the WW Rules in that the updated plumbing rules required a design by a Professional Engineer for any sprinkler system. The existing WW Rules allow for a Class B Licensed Designer, with the water system design certification, to design a water system with up to two sprinkler heads. The DEC contacted the Department of Public Safety and the existing approach for Class B Licensed Designers is still acceptable under the updated Plumbing Rules.
- F. The DEC reviewed a portion of the WW Rules related to reuse of an existing wastewater disposal system for a new use. Connection of an existing system to a building on another lot that will serve a new use is only allowed when the system is compliant with the current WW Rules. The language in the draft WW Rules has been improved to make this clear.
- G. The TAC discussed possible rule changes that would require proposed water and wastewater systems to be located on a lot so that isolation distances do not extend onto neighboring property when possible. This topic has been discussed several

times since the Vermont Legislation passed a requirement that any neighboring landowner be notified if a project subject to the WW Rules will be approved with isolation distances that extend onto adjacent property. A simple Rule change requiring that isolation distances remain on a property whenever possible leads to a question of whether the cost of keeping the isolation distances on the lot is justified. For example, would it be reasonable to require construction of a \$50,000 road to move a well drilling machine to a location that would reduce the distance the isolation distance extends onto a neighboring lot. Several members of the TAC said that designers already work hard to avoid having isolation distances extend onto neighboring lots because it reduces conflicts between neighbors.

The potential for an adverse impact on a neighboring lot has existed since the State of Vermont first started regulating the installation of water and wastewater systems. In most cases, the neighboring properties suffer no adverse or only minimal adverse impacts. The question becomes whether a person with a current proposal for construction should be denied because an adjacent property owner wants to reserve a right for future construction that may never occur. Currently the Vermont Legislature requires a notification whenever an isolation distance extends onto neighboring property but does not provide any authority for the DEC to deny an application based on a neighboring landowner's objection.

- H. The DEC is working on eliminating the jurisdictional overlap between the WW Rules, the Indirect Discharge Rules, and the Underground Injection Control Program. Some small on-farm discharges, such as those from small cheese making operations, are currently proposed to be regulated by the Vermont Department of Agriculture and will not be subject to DEC WW Rules. Wastewater discharges subject to the Underground Injection Control Rules are proposed to not be exempt simply because they are discharged as compatible wastewater into systems regulated under the WW Rules. These changes if adopted will provide better tracking information on the types and location of wastewater discharges subject to the various rules.
- I. The permitting of more than one well per property was discussed. The current WW Rules assume that the isolation zone will be protected for only one well per use on the lot unless more than one well is required to provide the minimum amount of water needed for the project. The goal of limiting protected isolation zones to only one well is because the establishment of protective isolation zones around a well can impose restrictions on neighboring properties if the isolation distances extend onto neighboring lots. Groundwater is a shared resource, recently declared as being subject to the public trust laws, and permitting additional wells with isolation distances extending onto neighboring lots when the additional water is not required for the project is not good policy. This concept is included in the exemption in the current rules that allows for replacement of a water supply that serves only one single family residence on its own lot without obtaining a permit.

When a replacement water supply is constructed under this exemption the existing water supply must be abandoned. The isolation zone for the replacement well will be protected but the isolation zone for the previous well will no longer be protected.

- J. The issue of wastewater strength was discussed. The wastewater system failure rate for commercial operations appears to be related to the strength of the wastewater that is discharged. Restaurants, slaughter houses, stores with large deli and food preparation operations, convenience stores, bakeries, and other similar operations often have high strength wastewater with Biological Oxygen Demand, (BOD), fats, oils, and grease (FOG), and Total Suspended Solids (TSS) at rates much higher than residential use. The TAC discussed the balance between very prescriptive approaches and assigning the responsibility to the Licensed Designer and the applicant. The DEC will propose requirements in the draft rules making the Licensed Designer responsible for determining wastewater strength and for designing a disposal system that either uses advanced treatment prior to discharge or increases the size of the disposal system.
- K. The TAC briefly discussed septic tank sizing. Members noted that many states have increased the minimum size of tanks in relation to the design flow and that use of two compartment tanks is often recommended or required. The TAC agreed that the WW Rules should require that any septic tank receiving pumped wastewater should be increased in size with a recommendation for use of a two-compartment tank.
- L. The TAC noted that the WW Rules should be specific about where isolation distances are measured from when dealing with mound systems. The group said that the distance should be determined using the minimum required basal area under the mound. The isolation distance tables and associated diagram in the draft rules should clearly indicate the measurement locations.
- M. The TAC discussed the requirement that a minimum of 12” of mound sand be used under the crushed stone. In some cases, the required separation from the seasonal high water table would be met with less than 12” of sand. The group decided that because the sand is placed over an area that has been plowed and where the depth of the furrows can vary significantly, the 12” minimum should be retained.
- N. The question of whether a bottomless sand filter application should require that a replacement area also be shown was discussed. Bottomless sand filters share the mound concept of providing some treatment in the sand between the crushed stone and the naturally occurring soil beneath the system. Both then rely on the naturally occurring soil to transmit the wastewater away from the system. The WW Rules do not require a replacement area for a mound system. The DEC has proposed that bottomless sand filters be approved for new construction but is

concerned that there is much less safety margin in comparison to a mound system. A mound system has a large amount of sand in the toes along the edges of the system that can compensate for errors in the soil and site evaluation. One suggestion was that the replacement area be dropped if the bottomless sand filter was dosed with pretreated effluent. The second suggestion was to eliminate the replacement area if the calculated induced water table was 12” or more below the surface of the native soil. These approaches would decrease the chance that a bottomless sand filter would fail within the sand filter itself but would not decrease the hydraulic loading of the naturally occurring soil under the system which is the main DEC concern.

- O. Current approvals of I/A systems require that inspections of the system be made by Licensed Designers at least once per year. There is a question of whether the use of a Licensed Designer should be required or if a system maintenance specialist should be allowed to do the inspection. The DEC is concerned that a system maintenance specialist may be too focused on the technology used in the I/A system and not familiar with the site evaluation process that should be part of a determination that the whole wastewater disposal system is functioning properly. If both a Licensed Designer and a system maintenance specialist inspects the system, the cost to the landowner may be excessive.
- P. The Drinking Water Section of the DEC discussed their proposal to change the requirements for a pump test to determine the long-term yield of a well that will serve a public water supply. The proposal is to reduce the threshold from 5 GPM to 2 GPM. The TAC asked if the current threshold resulted in many water systems that fail to meet the design requirements. The Drinking Water Section responded that there have been problem systems, particularly when existing systems try to expand their capacity. The TAC recommends that the existing 5 GPM threshold be retained for Potable Water Systems.
- Q. The TAC discussed if testing for radium should be a requirement if gross alpha is tested. The usual response if a significant level of gross alpha is found is to install a water softener which removes radium as part of its treatment process. One concern is that starting with gross alpha levels and then subtracting a subcomponent such as uranium, is a mathematical approach that requires assumptions when converting from pico-curries of gross alpha to micrograms of uranium. The Vermont Health Department said that even when gross alpha is less than the drinking water standard the level of other radioactive contaminants can be of concern and therefore testing for radium is recommended.
- R. The establishment of a primary drinking water standard for manganese was also discussed. The DEC Drinking Water Section said that testing for manganese is important for public water systems when certain water treatment methods are used that could result in harmful by products. Otherwise, manganese is more of an aesthetic issue when it stains clothes and plumbing fixtures. Currently there is

a secondary standard to deal with this issue. Adding a primary standard for Potable Water Supplies is not required.

- S. The specifications for well drilling casing materials were discussed. The WW Rules will propose reference industry standards for well casing and will propose a specification for 7” casing that is not currently included in the industry standards.
- T. The requirements for conversion of single family residences from seasonal use to year-round use were discussed. The current WW Rules review a full site evaluation by a Licensed Designer and the design of a replacement wastewater system if the current system is not fully complying. The design of the replacement system may include variances under section 1-806 of the WW Rules except that a holding tank system cannot be used. The question was whether the replacement system must be installed immediately, or can the construction be postponed until the system fails or the landowner decides to make the upgrade. The TAC suggested that these conversions often occur at the time of sale or as part of a significant upgrade to the property. These changes usually significantly increase the value of the property. Requiring the installation of the replacement wastewater system insures that the cost of the system is included in the process and not deferred to a later date when the landowner may not have funds available to install the replacement system.
- U. On July 21, 2017, the TAC received Subchapters 1 through 8 which had received a final legal review. Rather than meeting, members provided comments and edits to be incorporated into the next draft.

3. Innovative/Alternative Systems: During 2017, the DEC received re-approval requests, and reviewed and reapproved the following Innovative/Alternative systems.

| Company | Technology | Re-Approval Date | Expiration Date |
|-----------------------|--|------------------|-----------------|
| Orenco Systems Inc. | AdvanTex AX & AX-Max | 09/28/2017 | 09/28/2019 |
| Ecological Tanks Inc. | Aqua-Aire Aqua-Safe | 09/28/2017 | 09/28/2019 |
| Aquapoint. 3 LLC | Bioclere | 09/27/2017 | 09/27/2019 |
| Delta Environmental | ECOPOD-N | 03/30/2017 | 03/30/2019 |
| PremierTech Env. | Ecoflo Biofilter Ecoflo Coco Filter | 09/10/2017 | 09/10/2019 |
| FujiClean USA | FujiClean CE Series | 03/09/2017 | 03/09/2019 |
| Hydro-Action | Hydro-Action AP Series | 02/22/2017 | 02/22/2019 |
| Jet Inc. | Jet BAT Media Series | 06/30/2017 | 06/30/2019 |
| Norweco | Singulair Series Hydro-Kinetic | 01/25/2017 | 01/25/2019 |
| Eljen Corporation | Mantis M M5 LowPro Series | 11/29/2017 | 11/29/2019 |

| | | | |
|----------------------|--|------------|------------|
| Presby Environmental | Simple Septic Enviro-Septic Advanced Enviro-Septic | 01/23/2017 | 01/23/2019 |
| Aqua Test Inc. | The NIBBLER | 08/25/2017 | 08/25/2019 |

The DEC received one new approval application in 2017 from Island Water Technologies for the ClearPod™ drop-in, retro-fit, aeration and fixed film technology. Graham Bradley reviewed the application on behalf of the DEC and provided the TAC with a copy of this review for comments. The product has been tested at the Massachusetts Alternative Septic System Test Center (MASSTC), but not to the NSF/ANSI 40 Standard. Following communication from George Heufelder, MASSTC Director, the DEC concluded that this product does not reduce wastewater strength to 30 mg/l BOD and TSS under all the conditions required to receive full general approval with the association reductions. The TAC agreed and raised the question as to whether such retrofit technologies should be allowed to be used to extend the lifespan on non-complying “clean-slated” wastewater systems. The DEC agreed that the state could not condone the use of retrofit technologies in non-complying systems. Nevertheless, the State did not wish to prohibit the use of this technology in complying systems where they may be used to reduce BOD and TSS to extend the lifespan of a leachfield. Consequently, an approval was issued on January 7, 2018 which requires landowners to obtain a permit, or permit amendment, before installing the ClearPod system. The intention of this requirement is to ensure this technology is only used in complying systems.

APPENDIX A

Technical Advisory Committee Members as of December 1, 2017

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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,

Bottomless Sand Filters

Peter Boemig, Mark Bannon, Mary Clark, Denise Johnson-Terk, Craig Heindel, Ernie Christianson

Seasonal High Water Table Monitoring

Craig Heindel, Steve Revell, Roger Thompson, Ernie Christianson, Bill Zabiloski, Mary Clark

Well Driller's Reporting Form

Rodney Pingree, Craig Heindel, Claude Chevalier, Peter Boemig, Mary Clark, Ernie Christianson

Surface Water Sources

Tim Raymond, John Beauchamp, Ray Soloman, Peter Boemig, Mark Bannon, Claude Chevalier, Perry Thomas, Mark Clark, Scott Stewart, Rodney Pingree, Chris Russo, Ernie Christianson

Appendix B

Compliance with Performance Standards for Regional Office Permits

Issued During 2007-2017

| | # 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 |

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.

Permit Information for 2017

| Permits Issued to Repair Failed Wastewater Systems | Applications Denied |
|--|---------------------|
| 416 | 2* |

* Reasons for denials:

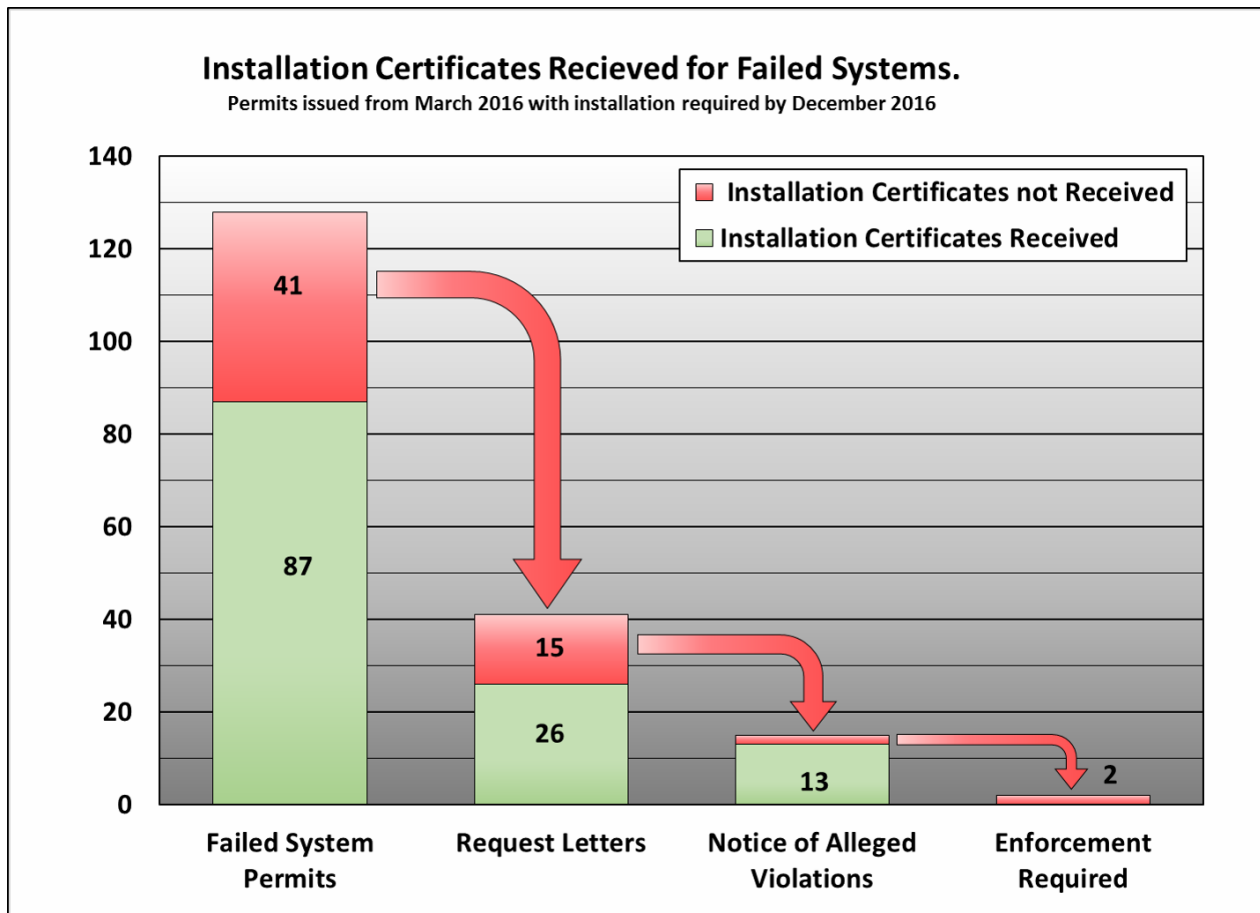
Denials are issued for applications that are incomplete or fail to demonstrate compliance with the Wastewater System and Potable Water Supply Rules when submitted.

Low Income Loan Program

During calendar year 2017 the On-Site Loan Program made twelve loan awards for a total of \$231,167 in new loan commitments. Two of the twelve loans were for replacement of failed water systems; the other ten loans were for replacement of failed wastewater systems. The program has partnered with the Opportunities Credit Union to underwrite and service the loans made under this program.

Failed Wastewater Systems Compliance Initiative:

Historically, it has been difficult for Regional Office staff to monitor compliance with a failed wastewater system permit condition requiring that a replacement system be installed by the permit specified date. The new Water and Waste Tracking System (WWTS) has a compliance module that allows the Department to create a compliance schedule and track the receipt of installation certifications. The permit specified project completion date is entered in a Compliance Schedule and landowners are contacted if an installation certification is not received.



In March of 2017 the first compliance outreach initiative to track compliance with project completion and submittal of an installation certification began. In March of each year compliance schedules for the previous calendar year's failed wastewater systems will be reviewed. If a system was to be installed the previous year and an installation certification date has not been entered in the compliance schedule, Regional Office staff will verify that the certification has not been received. If Certifications are not on file, letters are mailed to the landowners requesting the certification by a specified date. If there is no response to the letter, a certified Notice of Alleged Violation (NOAV) is mailed approximately 4 months after the original letter.

Between March and December 2016, 128 permits logged into the *new* tracking system had construction completion due dates in 2016. This number does not reflect all failed systems logged in 2016 since many were entered into the old tracking system. The Department received 87 installation certifications. Letters were mailed to 41 landowners requesting the missing certification. An additional 25 certifications and one permit amendment to extend the completion due date were received. The remaining 15 systems were sent a Notice of Alleged Violation (NOAV) with a response due date of 8-11-2017. A response was received from all but two system owners. Assistance from the Enforcement Division is requested at this point.

An unexpected response was that 4 of the original 141 systems were later determined to not be failed. The Department’s policy is to require a letter from a qualified designer identifying the minor repair that was made and certifying that the systems is not a failed system. Permits are null and void for constructing the replacement wastewater system if construction is not completed by the specified due date.

The number of failed systems compliance schedules tracked will increase significantly in future years since the 2016 data set included only the failed systems that were logged into the new tracking system. There are **322** systems that were required to be installed in 2017, compared to the 128 systems that were tracked in 2016. As of February 6, 2018; the Department has received 63% of the installation certifications that were required to be submitted in 2017.

Innovative/Alternative (I/A) Wastewater System Summary 2007 to 2017

| 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 |
| Total | 5663 |

Innovative/Alternative Permits in 2017

| I/A Manufacturer | Number of General Use I/A Products Permitted (excluding dispersal products) | Number of General Use I/A Dispersal Products |
|-------------------------------------|--|---|
| Advanced Aeration Group | 0 | |
| Advanced OnSite Solutions | 15 | |
| American Manufacturing | | 5 |
| Anua | 0 | |
| Aqua Test | 0 | |
| Aquapoint 3 | 1 | |
| Bio-Microbics | 2 | |
| Cromaglass | 0 | |
| Delta Environmental Products | 2 | |
| Ecological Tanks | 0 | |
| Eljen Corp | 0 | 1 |
| FujiClean | 4 | |
| Hydro-Action | 3 | |
| Infiltrator Systems | | 87 |
| Jet | 30 | |
| Norweco | 16 | |
| Orenco | 44 | |
| Premier Tech | 21 | |
| Presby Environmental | | 296 |
| SeptiTech | 1 | |
| Pilot Use Systems | 0 | |
| Experimental Use Systems | 0 | |
| Total | 156 | 389 |

**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 |

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 |

* estimated

Ernie circulated an updated draft of the Technical Advisory Committee (TAC) recommendations on groundwater testing by e-mail prior to the meeting. The TAC recommendations will be submitted to the Department of Environmental Conservation as required by previous action of the Vermont Legislature. The Vermont Legislature is considering whether or not to adopt a requirement that the water quality of all new groundwater sources be tested prior to use.

Ernie noted that his latest revisions included:

1. removing all references to the cost of testing because these may be changed periodically by the Vermont Department of Health;
2. moving all of section #4 of the draft to the appendix;
3. removing a section referring to the existing exemption in the Rules for single-family residences because that is already mentioned in the draft recommendations, and in fact, would be the only change if the Legislature imposes a testing requirement because all other sources are already being tested;
4. moving some language from the Opinion B section up into the discussion section; and
5. removing some language about the occurrence of cancer in Vermont because it included statistics about cancers not related to the consumption of groundwater.

Other discussion included:

1. existing information about areas in Vermont known to have naturally occurring groundwater contamination from radon, uranium, radium, and arsenic. Additional water quality testing may better define the areas that need extra attention;
2. removing comments about when to collect a water sample because there is no scientifically based single time that is ideal. The water quality may vary from when the source is first constructed because the water flow under pumping conditions may draw water of a different quality to the source.
3. adding comments about how a new requirement might affect title reviews. Will attorneys doing title reviews need to determine if a new source has been constructed and properly tested? Under the current Rules, replacement sources for a single family residence on its own lot is exempt from permitting requirements so checking State records for permits would not be sufficient;
4. adding a comment #9 to the Opinion A section stating support for the State Data Base of water testing results; and

| | |
|----------------|---------------------|
| Justin Willis | Gunner McCain |
| Steve Revell | Ernest Christianson |
| Peter Boemig | Chris Russo |
| Scott Stewart | Mary Clark |
| Ken White | Sille Larsen |
| Graham Bradley | Craig Heindel |
| Darlene Autery | |

Scheduled meetings:

| | | |
|----------------|--------|-------------------------------------|
| April 4, 2017 | 1-4 PM | at the Annex Building |
| April 18, 2017 | 1-4 PM | Catamount Rm. at National Life Bld. |
| April 25, 2017 | 1-4 PM | at the Annex |

Minutes:

The draft minutes of the January 10, 2017 meeting were approved.

Annual Report:

Roger will send the draft report to the TAC for review.

Rule Review:

Ernie led a page by page review of Chapter 3 of the draft rules. Many of the comments were related to the clarity of various sections with a goal of making everything as clear as possible for applicants, consultants, and reviewers.

There was discussion about the Department of Environmental Conservation (DEC) decision to use a different minimum design flow for water and wastewater systems serving at least five single family residences. The proposed design flow for water is 360 GPD per single family residence, regardless of the number of bedrooms. Scott noted that this approach allows for the connection of single family residences with large numbers of bedrooms to public water systems that may have limited capacity or for addition of bedrooms to existing homes on systems that are

under connection bans. Ernie will add language to the proposed rules that will cover situations where the public water system is under a connection ban.

The proposed language maintains the current wastewater design flows for more than 5 single family residences connected to the same system, regardless of the number of bedrooms. The current design flows are gradually reduced to 245 gallons per day (GPD) per unit for the wastewater when 20 or more units are connected to the same system.

Ernie suggests that the next meeting focus on Chapter 9 of the proposed rules because there is some new information to consider.

Legislative Actions:

Ernie said that the bill related to testing of all new water sources is still active. The TAC report outlining the issues has been considered by the House Fish, Wildlife, and Water Resources Committee that is working on the bill. It should be clear soon if the bill will be passed this year.

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

Bottomless Sand Filters

Peter Boemig, Mark Bannon, Mary Clark, Denise Johnson-Terk, Craig Heindel, Ernie Christianson

Seasonal High Water Table Monitoring

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category that would still approve a proprietary technology with conditions specific to that technology but that does not need a review under the I/A process for each installation.

Mark also asked about situations where the system owner would like to make modifications to improve performance or extend the life of the system. An example might be adding air to the system. Ernie said this should be considered but there are concerns about doing this with a system that is too close to the water table or a water supply. These systems should be reconstructed to improve compliance with the Rules rather than being modified in ways that could extend the life of the system to continue the flow of effluent into a shallow water table.

Craig asked why towns that have delegation under the rules are not required to submit information to the electronic tracking system so that the public can find this information online. Apparently, some of this information is online at the town level. Craig suggested having a link from the town system or passing the information along to the Agency of Natural Resources information system. Ernie noted that Morrisville is considering taking partial delegation so that they would issue the permits for the connections to the municipal water and wastewater systems.

Mark asked about the BW classification in Chapter 8. This classification allows non-engineers to be approved for some buildings that share water systems if the shared system is not regulated as a Public Water System. Mark noted that the existing language allows for Designers with the BW classification to design up to two sprinkler heads while recent changes to the plumbing regulations seem to require that any sprinkler system work be designed by a Licensed Professional Engineer. Ernie said he would contact the Public Safety Division and ask about the conflict. One possible outcome would be to allow the two sprinkler heads only for a single-family residence.

Ernie reviewed a few changes for Chapter 9. Language has been added to make it clear that variances are not allowed for a replacement system that will serve a new project. This question arises when a property with an existing building and an existing wastewater system proposes to discontinue the use of the existing building and use the wastewater system to support a new building, particularly on another lot.

After TAC comments, Ernie said he would add a separate employee category for factories based on comments that projects with factory workers have higher wastewater flows than office buildings and other places of employment.

Mark asked if language should be added to the Rules that all designs should be arranged to not have isolation distances extending onto neighboring properties if possible. The TAC has discussed this question in the past and concluded that this should not be added to the Rules. One major concern is where would you draw the line on greatly increasing the cost of development to implement a technically possible solution. One example might be building an extensive roadway

to move a well-drilling machine further onto a lot to eliminate or reduce the isolation distance intrusion onto the neighboring lot.

The TAC also asked about design flows for on-farm uses such as wedding barns, petting zoos, dining. One approach that is being used is to use flows that are assigned to places of assembly.

Ernie also discussed the DEC's work on clarifying when wastewater is regulated under the Wastewater System and Potable Water Supply Rules, the Indirect Discharge Rules, or the Underground Injection Control Rules. Some on farm wastewater such as small cheese making operations and apple processing operations may be regulated by the Department of Agriculture and therefore exempt under other rules.

Scott asked that language be moved in Chapter 10 with a recommendation that Zone 2 language be moved to the front of the section. Scott also asked that the Rules state that new wastewater systems in Class 1 and Class 2 groundwater zones are prohibited.

The TAC also discussed the issues related to having more than one well on a property. The Rules indicate that only one well will be approved for use unless more than one well is needed to support the normal project demands. One concern is that some landowners want to retain a second well, often a shallow well. A shallow well that maintains a protected isolation zone can have large negative effects on neighboring land owners so the Department works to minimize having two wells. If there are two pipes into a building and the only separation is a valve, then both systems are in service and the isolation zone is protected. If one line into the building is just capped off, that well is not protected even if the owner suggests it might be used in the future. It was also noted, that regardless of the owner's preference, if a new well is constructed using the well-driller's exemption, the existing well must be discontinued.

Justin said that the draft rules for drawing well shields and wastewater protection zones still have a conflict. This conflict means that locating a wastewater system outside of the well-shield does not assure compliance with the requirements for drawing the wastewater protection zone. Ernie said that he thought this problem had been resolved but will recheck the language and make any corrections needed.

Executive Committee: Steve Revell, Ernest Christianson, Roger Thompson
Alternates – Claude Chevalier, Craig Heindel

Subcommittees:

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Approved Minutes of the Technical Advisory Committee Meeting

April 18, 2017

| | | |
|-------------------|----------------|---------------------|
| Attendees: | Roger Thompson | Joe Rheaume |
| | Gunner McCain | Peter Boemig |
| | Rich Wilson | Steve Revell |
| | Sille Larsen | Graham Bradley |
| | Scott Stewart | Claude Chevalier |
| | Craig Heindel | Ken White |
| | Chris Russo | Ernest Christianson |

Scheduled meetings:

April 25, 2017 1-4 PM at the Annex

Minutes:

The draft minutes of the April 4, 2017 meeting were approved with Scott's correction that his concerns about Zones 1 and 2 are related to wastewater systems rather than wells.

S.103: Ernie reviewed the status of this bill, which among other issues, regulates the water quality testing of all new groundwater sources. Ernie testified at the Committee and explained that it would be difficult for the Department of Environmental Conservation (DEC) to implement a new program to test all wells. One concern is about the requirement to develop a data base that would be publicly available. Ernie suggested that this information be stored with the Vermont Department of Health. A second issue is what action would DEC take every time a water sample failed to meet drinking water standards. A process to immediately follow-up on each test would take a lot of resources. Ernie is considering making water sources that serve only one single family residence exempt from the definition of a failed water supply. This would result in the landowner being aware of any water quality issues and placing the responsibility to deal with the problem on the landowner. If there is a legislative requirement that the water source be tested, a title search at the time of sale should inform a future landowner of any problems with the water source.

Sille said that the Vermont Health Department is working a data base that would include all the water quality data. The results of all water quality testing done by Vermont Department of Health approved facilities is required to be submitted to the Vermont Department of Health and will be included in the data base.

Craig asked if surface water sources can now be approved under the Wastewater System and Potable Water Supply Rules. Ernie said that these sources can be approved under the Statutory requirements created in 2016.

Rule Review:

Ernie started with a review of Chapter 10. Craig asked if the draft rules would include drip dispersal. Ernie said that the existing section on drip dispersal, which gives a few general instructions that are applied to the recommended design standards by equipment manufacturers, would be continued.

Ernie discussed section 1004 that deals with wastewater strength. The draft rules include two design approaches that yield different sizing results. The TAC recommendation is to select whichever approach that seems most appropriate and delete the other. A subcommittee can consider this if needed.

Steve asked if the use of grinder pumps should require larger septic tanks. The TAC agreed that larger tanks should be used when pumps discharge into a septic tank. All pumps create a surge in the tank that may reduce the effectiveness of the settling process. Grinder pumps that create small particles may be a larger problem because the small particles may not settle out of the effluent as well. It was noted that there is a general trend nationwide to increase the size of the septic tank and towards the use of two compartment septic tanks.

Craig asked that the draft rules give specific guidance on measuring points when determining the isolation distance from a minimum effective basal area under a mound system.

Steve asked about reducing the current minimum of 12” of mound sand under the crushed stone when the vertical isolation distance could be met with as little as 6” of sand. The TAC said that this is a construction consideration. There are concerns about how it could be ensured that the sand depth would start at the top of the plowed ground rather than the bottom of the furrow. The group recommended keeping the 12” minimum.

Ernie noted that he has added a requirement that the percolation tests be located within a certain distance of the test pits. The TAC suggested that the requirement should be that percolation tests are done in a pattern that defines the soil under and downslope of the leachfield.

Craig asked if the replacement area requirement for bottomless sand filters could be removed. Ernie noted that the proposal for use of bottomless sand filters will for the first time allow for new development. The size requirements for bottomless sand filters result in very small areas and if any problems arise there may not be any room to fix a failed system. Craig suggested removing the replacement requirement if advanced treatment is required. Ernie asked for opinions on this approach and the group did not reach a consensus.

Chris asked about the annual inspection requirements required in permits for Innovative/Alternative Systems. She said that with the current requirements a landowner must pay for an inspection by a licensed designer and an inspection by a person certified by the system vendor. This often means two different people and double the cost for the annual inspections. This tends to lead to people ignoring the inspection requirements, particularly the requirement for the Licensed Designer’s inspection report. The group discussed this issue with Ernie noting that he believes having a licensed designer involved results in more information about the status of the dispersal system. The vendor required inspection may only look at the operation of the advanced treatment system which may be functioning as designed even if there is leakage at the toe of the dispersal system. Chris strongly recommended that a landowner be clearly notified of the cost of operation and inspection requirements for the specific system because the number one complaint is that they did not know how much it would cost.

Chapter 12 was briefly discussed. Ernie said that clarifying language has been added to exemption related to the section on instantaneous peak demand on the water system for single family residences. The exemption allows for a single-family residence, with an included one bedroom unit, that has a total design flow of 560 GPD or less, to be constructed without use of a holding tank to meet the instantaneous peak demand on the water system.

Claude asked about section 1203(a) that limits a project to only a single well unless a single well cannot provide the required amount of water. Under this requirement, the well driller's exemption that allows for a replacement water source for a single-family residence without a state permit would not apply if more than one well is required for the single-family residence.

Ernie said that the use of surface water as a potable water supply depends on a quality determination using the Lakes and Ponds Division mapping of water quality.

Meeting:

Ernie asked that the group meet again on April 25th. The meeting will be at the Annex Building.

Executive Committee: Steve Revell, Ernest Christianson, Roger Thompson
Alternates – Claude Chevalier, Craig Heindel

Subcommittees:

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Approved Minutes of the Technical Advisory Committee Meeting

April 25, 2017

Attendees: Roger Thompson Ernest Christianson
Graham Bradley Joe Rheaume
Justin Willis Gunner McCain
Claude Chevalier Rich Wilson
Scott Stewart Peter Boemig
Chris Russo Ken White
Rodney Pingree John Beauchamp

Scheduled meetings:

| | | |
|--------------|--------|--------------------------------|
| May 9, 2017 | 1-4 PM | Winooski Room at National Life |
| May 16, 2017 | 1-4 PM | at the Annex |

Minutes:

The draft minutes of the April 18, 2017 meeting were approved with the addition of Chris's comment that the designer's inspection report for I/A systems is often not submitted.

Rule Review:

Ernie opened the discussion of Chapter 12. Scott said that the Water Supply Section is proposing to reduce the threshold for a pump test from 5 GPM to 2 GPM. He said that this would provide additional information about the true capacity of a well that would be useful for increases in design flow and failed water supplies. Gunner asked if there have been many problem well where this approach would have prevented the problem. Scott said there have been some problems, though it is not known how many of the projects had been approved under the current Wastewater System and Potable Water Supply Rules (Rules). Gunner suggested that the 5 GPD threshold be maintained for Potable Water Systems. Ernie will review the situation with Scott but the sense of the Committee is to keep the current number.

Scott suggested moving section 1209 to after section 1210 thinking that this would more closely follow the process used in designing a water supply. Scott also proposed adding a definition for total available head and to require the total available head to be specified in a permit application.

The group recommended removing section 1218(c). John asked if radium should be added to table 12-6 as a required item for testing. This led to a discussion of testing for radioactive elements. The TAC discussed this issue in past years when the current list was developed and when the statutory language allowing for the addition of water treatment systems without a permit was passed. Ernie will consider the current thinking and speak with Sille Larsen, Health Department, to see if a gross alpha test and/or radium should be added.

Peter asked about section 1303(c) and whether a potable connection can be made to a line constructed to serve fire protection systems. This depends on the arrangement of the piping. If the potable water is protected against backflow from the fire system and not connected to a portion of the piping that might tend to be stagnant, the potable water connection can be approved. The issue of installing valves, pumps, wells, etc. in below ground pits was reviewed. The current Rules allow for this when needed but with a requirement that the pit have passive drainage for any accumulated water and protection against flooding. Passive drainage is often difficult unless the site has a significant slope. It was agreed that some items, such as valves, are not likely problems if the pit is not passively drained. Other items such as wells can be contaminated if not properly sealed and vented. These decisions are somewhat case specific. Ernie will check with the Public Water Supply Section regarding below grade valve boxes.

Ernie will check into whether all water service lines should be leakage tested. This can be a significant expense and a delay in completing a project. Gunner noted that he would not participate in a high pressure (water system operating pressures) air test because of potential danger if any of the connections failed under pressure. Ernie will review the pressure testing requirements.

Claude asked if the 5 ½' bury depth could be reduced to 5'. There is an VOSHA standard that requires trench boxes for trenches deeper than 5'. It may be possible that benching the sides of the trench can be allowed instead of trench boxes. Ernie will check this. The Rules do allow for a reduction in bury depth when using foam board insulation.

Ken suggested that the Rules give specific guidance on additions to well casings. The additions should be made of the same material as the existing well casing and either attached with threaded connections or by welding that makes the connection watertight.

Claude asked about the Rule requirement that well disinfection should be done with a minimum level of 50 mg/l of chlorine. Claude said that when disinfecting wells currently in use, the 50 mg/l of chlorine is intolerable for the users. Even with a 5 mg/l concentration the chlorine taste

can linger for days. Claude said that New Hampshire uses a 10 mg/l standard. Ernie will consider this.

Meetings:

Additional meetings were scheduled for May 9, 2017 in the Winooski Room at National Life and for May 16, 2017 at the Annex.

Executive Committee: Steve Revell, Ernest Christianson, Roger Thompson
Alternates – Claude Chevalier, Craig Heindel

Subcommittees:

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Approved Minutes of the Technical Advisory Committee Meeting

May 9, 2017

| | | |
|-------------------|----------------|--------------------|
| Attendees: | Roger Thompson | Claude Chevalier |
| | Rich Wilson | Gunner McCain |
| | Graham Bradley | Ken White |
| | John Beauchamp | Steve Revell |
| | Sille Larsen | Ernie Christianson |

Scheduled meetings:

No meetings are currently scheduled. Ernie will ask for a meeting when he has material ready for review.

Minutes: Steve noted that he had not attended the April 25, 2017 meeting. The draft minutes will be corrected.

Radiation Testing:

Steve commented about testing for radium. This might not be necessary, because when a test for gross alpha and uranium shows any radiation, a water softener is added to the system which removes radium along with other contaminants.

John discussed the process of calculating radium levels by subtracting uranium from gross alpha. One concern is that uranium is measured in micrograms and radium is measured in picocuries. The methods use ratios varying from 0.67 to 1.5. Radium is a whole house contaminant because a person should not bath in water with more than 5 picocuries. Sille said that the Vermont Department of Health recommends that when gross alpha is between 5 and 15 picocuries there should be a discussion of whether to test for radium.

Ernie asked if there is a primary standard for gross alpha and there is. Sillie notes that even when the contamination is less than the primary standard there can be concerns depending on which contaminant is present.

Sub-Chapter 12:

Sille noted that standard formatting does not allow text material to be included within the table itself. The group recommended some wording changes such as using Right of Way rather than ROW.

Ernie asked if fluoride should be on the list for required testing. John said that he rarely finds levels above 4 PPM. Levels above this are a health risk. Sille noted that fluoride is a primary standard and currently included in the standard Vermont Health Department water testing package.

Ernie reviewed the results of an email exchange with Tim Raymond. Ernie contacted Tim about some TAC concerns and Tim responded as noted below. Ernie will circulate the email to the group.

The group asked about the language stating that potable water service lines shall connect to a main, not to a fire hydrant lead line. It may be just a language issue in that a hydrant lead line is one coming from a main that flows only to fire hydrant. The concern is that the water in a line connected to fire hydrants may become stagnant.

The group also discussed the use of valve pits and whether the requirement for passive drainage is realistic and necessary if the components in the pit are of water tight construction. Tim thinks that the pits must be dry and watertight.

Scott had asked that manganese be considered a primary standard. There is a current secondary standard of 0.5 mg/l. John noted that it is rare to find manganese at more than 0.3 mg/l. Tim said that the Water Supply Section's concerns are with systems using orthophosphates for water treatment which would be rare for a non-public system.

Tim does not object the continuing use of the term Instantaneous Peak Demand rather than Peak Instantaneous Demand.

Sille noted that she believes testing for manganese is more important than testing for fluoride.

Sub-Chapter 13:

The Wastewater System and Potable Water Supply Rules (Rules) regulate water lines connected to Public Community Systems from the curb stop on. When the supply is a Non-transient Non-community System, the water line is regulated from the building to the water main but only those issues specific to the Rules are covered. In most cases, all the interior piping is covered by the Vermont Plumbing Rules and not subject to additional review. Ernie has added language that exempts lines serving only a single-family residence from the pressure testing requirements.

Ernie is waiting for comments from Mike Kline related to water and sewer crossing construction requirements.

Gunner asked if the surface water crossing depth requirements have been reviewed as the draft rules seem excessive.

Claude asked about the requirements for well casing thickness. The draft refers to Schedule 30 pipe and there is no specification for 7" pipe. Ernie will add a statement that ¼" wall thickness is acceptable for 7" pipe.

Jurisdiction Issues:

Ernie is working on the transitions between the Wastewater System and Potable Water Supply Rules, the Underground Injection Control Rules, and the Indirect Discharge Rules. One change that is proposed is that if a discharge requires an Underground Injection Control permit it cannot be discharged into a system regulated under the Wastewater System and Potable Water Supply Rules.

Sub-Chapter 11:

Ernie made changes to §1-1103 to include sewer service lines.

Ken asked if the language related to reconstruction without a permit has been retained. Ernie said it had.

Steve asked about the section of the rules related to conversion from seasonal to year-round use. Would it be reasonable to continue with the requirement to identify a replacement water and wastewater system but allow the continued use of the existing systems until they fail? The group had concerns that, because some of the existing systems are very substandard, even though they do not meet the definition of being failed systems, the increased use might increase contamination problems. Gunner said that generally the conversion from seasonal to year-round use makes the property much more valuable and it makes sense to upgrade the system at that time.

Steve suggested adding a note to the section discussing groundwater monitoring that all monitor pipes should be installed with a bentonite seal.

Gunner said that the diagram related to determining the wastewater protection zone should be modified to show the minimum required basal area.

Claude said that in section B-13 the statement prohibiting taping in lieu of strapping electric lines to the waterline should be removed. There is tape made for this purpose that works well and in many cases the strapping does not remain in place.

Claude will send Ernie a diagram for the installation of a screened well.

Gunner noted that, in section B-6, an alternating system is not required.

Gunner asked if in section B-7 if the requirement for maximum ground slope should be 30% rather than 20%.

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