ALTERNATIVE/EXPERIMENTAL WASTEWATER TREATMENT TECHNOLOGIES TECHNICAL REVIEW COMMITTEE (TRC)

The meeting was held at the Quonset Development Corporation Annex
95 Cripe Street, North Kingstown, RI

October 28, 2010

Approved Minutes

Present: Ken Anderson, Noel Berg, Dave Burnham, Russ Chateauneuf, Joe Frisella, Susan Licardi, George Loomis, Brian Moore, Tim Stasiunas and Dennis Vinhateiro

Absent: None absent

Others Present: Bob Mayer, American Manufacturing Company representative, Dich Bachelder, Advanced Drainage Systems, Inc's representative and Deb Knauss (DEM)

Call to Order: 8:50 AM

Materials Distributed:

- Draft Agenda for this meeting
- Draft Minutes of 9/29/10 meeting
- Summary of American Manufacturing Company's Perc-Rite drip system application
- Advanced Drainage Systems, Inc. application for ARC plastic leaching chambers
- SeptiTech's details for their M2500

Minutes of September 29, 2010
It was noted that Brian Moore, whose name appears at "Present" and "Absent", was actually absent.

On Page 2, at Infiltrator discussion, in the tenth paragraph, second sentence insert "i" in Quick4: "They reported that the Quick4…".

On Page 3, in the fourth paragraph, first sentence, change "Time" to "Tim".

Motion: Tim made a motion to accept the minutes with the necessary edits.
Second: Susan seconded the motion.
Discussion: There was no discussion.
Vote: All present who were present at the September 29th meeting voted to approve the minutes as presented (Brian, Dave, Ken and Noel, who were not at that meeting abstained).

Other issues:
George asked that we add to Old Business, discussion of (see page 2 in minutes from last meeting) PSND construction, the need for inspection of the excavated bottom and the difficulty this presents for trench-by-trench construction.

Tim asked to include a clarification of the August 4, 2010 OWTS Rules.

American Manufacturing Systems, PercRite Drip System Application Summary
The application is for use with both septic tank effluent (STE) and treated effluent. George explained the disk filtration preceding the drip system and its removal of the solid portion of the BOD and TSS load (to 115-micron).
Tim asked if STE would be allowed a more shallow bury depth because of this. George is comfortable with a minimum 12-inch bury depth. Installation at greater depths would eliminate the enhanced treatment achieved by shallow installation in more biologically active and better-aerated soil. He explained that it is free-draining after dosing therefore no water remains in the tubing to freeze.

Ken asked if we define "infrequent use" anywhere, since there is a requirement for 18-inch bury-depth required when Geoflow is installed where the system is to be used infrequently (in contrast to 12-inches where the system is to be used continuously). Russ stated that although "infrequent" is not defined, it is intended to mean seasonal, or weekend use. George noted that this was addressed when conditions under which a holding tank may be permitted was being considered.

The holding tank policy and the Geoflow approval are the only two places in RI onsite regulation and policy where seasonal use is addressed. In the holding tank policy, the threshold is use for less than 120-days/year, whether seasonal, intermittent, infrequent, or even weekend use throughout the year.

RI has minimal snow cover; if a system doses and drains properly, we will not have a problem with freezing. The next dose will defrost the soil in the area of the emitter. Although Russ could not recall all the discussion, it was after careful

consideration of our cold winters, lack of snow, risk of freezing and most appropriate bury depth, that 12 and 18-inch bury depth as a function of constant or intermittent use was decided upon.

George suggested that we consider other cold weather states' approvals and see where they bury. He asked about the MA approvals and Deb reported that MA's General and Remedial Use approvals specify a 6-inch bury depth.

Advanced Drainage Systems, Inc. Dick Bachelder Introduction

Russ introduced Dick Bachelder who submitted an application for American Drainage Systems (ADS) plastic leaching chambers. Dick attended the meeting to introduce himself to the TRC. He explained that the technical support in the application suggests that ADS's chambers work the same way that Infiltrator's chambers do and that they therefore also warrant the same reduced leachfield size. He told the group to not be afraid of the size of the application, emphasizing the similarity of his chambers to Infiltrator's and also that these chambers are approved in every state except RI and Alaska and that is only because he had not requested approvals from these states.

American Manufacturing Systems, Inc. PercRite Drip System, Bob Mayer

Bob Mayer provided some history of his company and the production of the PercRite drip system. He explained that they provide state-specific design tools, to accommodate the unique elements of each state's approval. The calculation tool would be changed to provide accurate design parameters, specific to a RI approval and that this can be made available on the web. He did state that although the design tool does accommodate about 100 standard details, it can not accommodate all possible site-specific parameters, and that in these cases, the designer may call the American Manufacturing Systems engineers and do all the necessary the math manually.

He emphasized that an advantage of PercRite is enhanced treatment in the soil environment facilitated by unsaturated flow beneath the drip field, with either septic tank effluent or with advanced treatment system effluent.

Dave noted that the RI approval issued for Geoflow was based on treated effluent and that we required automatic field flushing. He asked for an explanation of "washdown". Bob explained that PercRite uses disk filters rather than screens. He explained that the emitters can transmit particulate up to 800-microns, that the disks filter to 115-microns, and described the design of these disks as providing both surface area and depth, with the depth of the veins in the disks defining the micron setting. The filtrate from one disk filter is used to wash the other; this is washdown. At the beginning of each dose cycle, a valve opens and washes down the filter. Once a year, the disk filters need to be removed and cleaned. The fully automatic process involves washdown at the initiation of every cycle and 12-minutes in to each dosing event. Washdown is delivered back to the head of the system. This washdown process is not needed with secondary treatment.

PercRite uses automatic field flushing and a flow meter on every system. Pressure and flushing are keys to keeping the system clean and properly functioning.

Each system has a 5 GPM zone set up so that every 2-weeks the system opens a flush valve, this flushes out the tubing and brings the water back to the head of the system. During maintenance calls, the service provider will look at flow meter and it should still read 5 GPM. If it is less, it indicates a clog; if it is higher, it indicates a leak in the system.

George reported that the Training Center installed a PercRite system under one of the demo projects in 1998 in Charlestown. Dave Burnham, Joe Frisella, Brian Moore and Bob Mayer all participated in the installation. There were no problems with the installation or its use after installation. This system was buried at 10-inches and received full-time year-round use. It was an easy and clean installation and after 5-years, Bob reported that all he had to do was replace a pump.

Joe asked about maintenance. Bob reported that there is a New England representative, Dan Ottenheimer, and that he has a customer base of contractors in New England, so he will set up contractors here in RI and if Joe is interested he could be one of them. They give a course that authorizes a person to perform maintenance on the system and provide attendees a letter certifying that the course was attended.

Joe asked what the advantages of this system are. Bob replied that it is an engineered product. It is very reliable and the design guidance and technical support of engineers and soil scientists make it very easy to design and to work with. He stated that they are requesting the same reductions assigned to other similar systems. He also stated that they promote longer skinny systems as a preferable design, where possible. He explained that they establish linear feet of tubing required with 2-foot spacing, by dividing the leachfield area required by a state's regulations, by 2. The system has top-feed manifolds. The top-feed manifolds deliver effluent to each lateral at the same time, facilitating equal distribution. This advantage of top feed manifolds is most important on sloping sites. Emitters discharge as soon as they receive effluent, so on a sloping site with a side-fed system, the emitter farthest from the delivery system will receive less effluent per dose than the closest. Side feed systems' require greater dose volumes than top-feed manifolds to reduce the effect of preferential dosing as a function of distance from manifold and elevation change and this is contrary to the objective of micro dosing.

Supply and return lines are installed below the frost line, this prevents freezing.

There was discussion about the location of the filtration unit and the control panel. Bob stated that he prefers that the panel be located next to the filter, which facilitates efficient O&M. The panel housing is a 17 X 30" valve box, 2-3 feet above

grade; it contains a thermostatically controlled heater and is on an aluminum skid (the skid is the heater), installed on a gravel base.

Bob stated that the systems may be one or two zones and up to 64 zones on large systems. The panel can turn off a zone, or all but one zone on systems that are used near capacity only seasonally, as ski resorts for example.

Bob explained that American Manufacturing does not make the tubing, they use Netafim tubing, which he reports is the largest tubing manufacturer in the world. He explained that the tubing is not impregnated with any chemical biocide, but that pressure and velocity keep the tubing clean.

The emitters are ¾-inch long and are manufactured in Israel; the tubing is extruded in Fresno, CA. Russ asked if it would be a problem if RI include in an approval, the condition that these two (emitter and tubing) specific manufacturer's products be required? Bob said that that would be an acceptable condition.

George asked if the orifices are oriented in the down position when installed. Bob stated that the memory of the tubing places them in the down-facing orientation, but that it really does not matter.

Brian asked Bob's opinion of non-pressure compensating emitters. Bob stated that even with all his credentials he can't design a system with non-pressure compensating emitters that would provide equal flow because of their functional limitations. He stated that unless a site is very small and very flat, he would use and recommend use of pressure compensating emitters.

Brian asked if PercRite would require any design changes based on the treatment system preceding it. Bob replied that certain treatment systems belch a lot of solids and although these won't get through to the drip tubing because it is protected by the disk filters, it is a maintenance issue.

Joe asked if there are any treatment systems that they will not use before PercRite. Bob answered that there are none that they prohibit, but that there are strengths and weaknesses associated with some types of treatment systems. Specifically, SBRs have been less successful with small residential systems. Extended aeration systems tend to get overloaded and belch solids that will build up in the pump chamber, which in some cases may be functioning as a final settling tank. He generally prefers fixed film systems, but stated that any system that has NSF or ETV certification or RIDEM approval, essentially any system that can achieve 30/30 TSS/BOD is suitable to precede PercRite. He explained that if the disk filters clog, the system will activate an alarm and that that they use telemetry a lot with large systems. By Rule, a large system, in RI is defined as 5,000-gallons, with testing required at 2,000-gallons. There was discussion of whether we should require telemetry for PercRite and of products as well, and if so, under what condition. Russ suggested that we would require telemetry for PercRite receiving STE at design flows over 2,000 gpd and at a separate meeting discuss large systems and consider imposing telemetry for all systems over 2,000 gpd. It was agreed that telemetry would be required for STE systems over 2,000 gpd using PercRite.

Russ asked Bob if he had seen the RI approval for Geoflow and explained that required that the drip system be preceded by advanced treatment. The idea of septic tank effluent (STE) distributed by a drip system is new for RI. George stated that the PercRite system installed under the demo project received STE, incorporated disk filter filtration and there were no problems with that system. George and Dave described the system for the group. It included a backup PSND, which they recalled was only used once.

PercRite is approved for STE in DE, MA, OH, NC, PA and VA. George stated that we need to remember that the STE is dosed, automatically flushed and that the filter disks retain particulate at 115-microns and the emitters can handle 800-microns.

There was discussion about surge storage capacity and how the system responds to heavy volumes. Bob explained that peak enable delivers the design limit dose and that when there are surges the dosing frequency increases, not the dose volume. There was discussion about what kind of storage should be required. Size the pump chamber to accommodate operating volume and 1/3 daily design flow was suggested. The Demo system had a 1,500-gallon two-compartment septic tank and a 1,000-gallon pump tank. It was suggested that we could require a 1,000-gallon minimum pump tank volume; we need to accommodate flush and complete dose volumes. The Geoflow approval requires the dosing tank to be two-times the design flow; this will therefore be required of PercRite.

Bob stated that although standard line separation is 2-feet, if a tree has to be worked around, they can get within one-foot of each other. Russ stated that RI Rules require a 10-foot setback to trees.

There was discussion of how to deal with high strength wastewater as an organic loading calculation and pounds of BOD/linear feet of tubing. In some cases, it would be better to pre-treat high strength wastewater. Russ stated that RI would be more likely to require pre-treatment than a larger field.

Burial depth discussion: George explained that RI winters are cold but that our proximity to the ocean generally results in less snow-cover than other cold areas of the country and while homeowners are encouraged to maintain a longer grass height

over the drip field, this can't be guaranteed. What depth does Bob recommend? Bob reported that they have never had to install at a depth greater than 1-foot and he would be comfortable with a 1-foot bury depth requirement.

Dave asked if PercRite can be installed over a failed system. Bob replied that they have done this and it has worked well.

Bob stated that he would like the same loading rates that were approved for Geoflow. Deb explained that she looked at the PercRite rates for treated effluent and compared them to the loading rates approved for Geoflow. While there were some discrepancies, they were few and were small. Bob is willing to look at these discrepancies and consider adjusting PercRite's rates, stating that PercRite is capable of managing the same rates as Geoflow. Deb will provide the hydraulic loading rate table for their review.

Tim asked if there is a design flow at which they would like to review the design. Bob stated that designers are trained to use the design calculation tool and if the design matches the design calculation tool, the company is comfortable with it. When systems are large and do not fit the parameters accommodated by the design tool, designers are encouraged to seek company technical review.

There was discussion of whether this application should be for a treatment system or for a component. Deb stated that she considered it a component, since the distinction between component and system/technology has been held to be whether treatment is being performed, such that a treatment claim is made and supported by performance data. Since this is not the case, she considered PercRite to be a component. Other opinions were that the pump and filters included as part of the PercRite system are mechanical and more complex than a simple gravity fed leaching component, with O&M requirements and therefore should be considered a system. George doesn't think of the disk filters as a treatment device, but rather, accommodating use of the tubing. Dave thought that he is leaning toward component, since there is not a treatment performance element to the application. It was decided that it is most appropriate to consider PercRite a Class 2 component.

Russ stated that the most significant part of this application for us is dealing with the STE and appropriate loading and sizing using the 2-foot grid of emitters and line spacing. He worked out an example comparing his areal calculation for PercRite to that for a pipe and stone trench field, spaced 5-foot on center with a deep SHWT and with 10-foot on center spacing for a shallow SHWT. Bob said that the same sizing is used, that you put the grid on the same size field/area. Three 3-foot wide trenches would be 1200 square-feet. PercRite is ½ this in linear feet, so 600-feet of tube would be required at 2-foot line spacing.

There was discussion of the difference between two and three-foot wide trenches and how this would impact the equivalent sizing of PercRite system. It was agreed that while the difference would not be great, Dave suggested that that design guidance should use the typical three-foot spacing with six-inches of stone, as the conventional stone and pipe field design used to establish equivalent tubing required. This appealed to everyone.

Brian thinks that we should require pre-treatment to 30/30 and not allow STE. He does not like the idea of having two sets of loading rates and thinks that consistency is important for successful use, that there would be a benefit to all drip systems being designed the same in RI, using the same parameters.

Russ asked what others think about STE. George stated that he did not have any problems with the PercRite system he installed under the Demo project that received STE. Tim stated that he thinks that the treatment is better putting STE through PercRite, than flow diffusers. George agreed that this would provide better treatment and we would want to encourage it. In a critical resource area, if there is no reduced separation to SHWT or horizontal separation distance benefit, designers will use the system that results in the smallest size field, which would generally be a BSF, although PSND's have become more competitive since the SFGD was revised.

It was suggested that this may be a suitable option in a repair situation. A new septic tank may be required, but the drip line could be installed over the existing field.

Discussion and summarization of issues considered thus far resulted in agreement on:

- Bury depth of 12-inches except for seasonal systems, which will require 18-inch bury depth.
- Separation distance to SHWT and impervious layer will be 3-feet to SHWT and 5-feet to impervious for STE and 2-feet to SHWT and 4-feet to impervious for treated effluent.

It was asked if we would allow PercRite to be installed above grade in fill, observing the fill perimeter required by Rule and 3:1 to original grade. Brian suggested we think of it as a PSND: if the field needs to be out the ground, another option needs to be considered. It was agreed that we would not address installation in fill.

Russ asked if there was a motion to recommend PercRite for approval.

Motion: Dave made a motion to recommend approval of PercRite as a Class 2 component with the same language as Geoflow, including automatic flushing, and the additional requirements for telemetry for STE systems over 2,000 gpd Separation distance to SHWT and impervious layer will be 3-feet to SHWT and 5-feet to impervious for STE and 2-feet to SHWT and 4-feet to impervious for treated effluent.

Second: Noel and George seconded the motion.
Discussion: There was no discussion.
Vote: Everyone present voted in favor of the motion.

OSI Low Profile RSV Installation/mounting
Russ reported on the site visit that Bob Johnson arranged for viewing this alternative RSV configuration, with a fiberglass support mounted on the exterior of the septic/processing tank. He and the others who participated are satisfied that if the return line from the AX pod to the septic/processing tank enters the end of the tank, that the fiberglass plate on the exterior of the septic tank will provide sufficient support. If the return line enter the side of the tank, in addition to the fiberglass plate, they will use a strap, bolted to the interior of the riser. Russ said that they will provide us with details of these two configurations.

Russ said that if the low profile alternative is used, that the designer will have to submit As-built plans with the Certificate of Construction, so that the file will officially reference the mounting orientation of the AX pod. He stated that DEM will notify the OWTS community via listserv.

George noted that there was no inlet sanitary tee in the septic tank at the system that was observed at this site visit. The designer of this system, who was on-site said that the installer (who was not present) never puts them in because they are prone to clog: the installer had received a lot of call-backs on back-up issues when a sanitary inlet tee was installed; when he did not install one, he did not receive call-backs regarding back-up issues from these system owners. Therefore, he no longer installs them. George said that NEOWTP is stating in their courses, that these are required on all systems. Russ supported this, since it is required by Rule, but he also stated that he had not heard about problems associated with their use until this site visit." There was discussion among the group at this site visit about the pros and cons of installing sanitary inlet tees, and it was agreed that there is greater merit to using them than to not doing so. If there are sufficient problems documented in the future however, Russ stated that we would consider re-evaluating their use.

SeptiTech
Deb distributed the M2500 details and email from Josh Cobb seeking its inclusion in the SeptiTech nitrogen reduction approval issued September 17th. She explained that this model is proportionally scaled up from the one that received the NSF certification. The group agreed that it may be incorporated into a revised nitrogen reduction approval for SeptiTech.

Next Meeting
The next meeting was scheduled for December 1st at 8:30 am, pending availability of the QDC Annex.

Adjournment
All business concluded, no other issues were introduced and Russ declared the meeting adjourned.

The meeting adjourned at 12:55 PM.