

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

**The meeting was held at the Quonset Development Corporation Annex
35 Belver Avenue, North Kingstown, RI**

March 27, 2012

Draft Minutes

Present: Ken Anderson, Noel Berg, Russ Chateaufneuf, Susan Licardi, George Loomis, Nikki Schultz, Tim Stasiunas and Dennis Vinhateiro

Others Present: Brian Moore and Deb Knauss (DEM)

Call to Order: 8:45 AM

Materials Distributed:

- Draft Agenda for this meeting
- Draft Minutes of 2/28/12 meeting
- Proposed draft rules, with summary
- Proposed revised Design and O&M manuals for Nitrex
- Table of Approved AE Technologies' System Category, type of approval and conventional leachfield reductions
- Treatment System Attributes
- Table of leachfields ranked by treatment potential and capacity for moisture management
- Revised Certification for Polylok effluent filters, includes PL-525 and PL-625 with previously approved PL-122
- Revised Certification for ARC chambers, naming Infiltrator Systems, Inc. as certification holder and vendor

Review of Draft Minutes of February 28, 2012

Motion: Tim made a motion to approve the minutes with the correction noted.

Second: Ken seconded the motion.

Discussion: There was no discussion.

Vote: All who were in attendance at the meeting February 28th voted in favor of the motion.

Proposed Regulatory Changes to Address Concerns of South County Towns

Russ reported that there was a meeting March 5th with South coast municipalities' staff, elected town officials, state representatives, some TRC members, and some DEM staff. This meeting resulted in minor revisions being made to the draft rules. Public notice on the proposed revisions will be issued shortly, perhaps as early as the end of this week. Since the TRC had reviewed and contributed to the draft Rules, we are providing them the revised text of the draft Rules that resulted from this last meeting on March 5th.

Nitrex Update

Russ stated that all treatment systems have a start-up period and that 4 – 6 weeks is generally expected and accepted. The 6 – 9 month Nitrex start-up, based on our recent experience with the first installation in RI is clearly too long without some mitigating measure incorporated into the system. At the TRC meeting January 26, 2012, the TRC reviewed several measures proposed by Lombardo Associates, Inc. (LAI), vendor of Nitrex, to handle the high concentrations of soluble BOD in Nitrex effluent during start-up. LAI has revised the proposal by eliminating all the measures except recirculation of the Nitrex effluent to the second compartment of the septic tank. Pio Lombardo of LAI, explained in a meeting with DEM, that recirculation of the Nitrex effluent as proposed, will reduce the start-up interval. LAI has prepared draft revisions to the Nitrex design and O&M manuals and Deb emailed these to the TRC Friday 3/23.

Russ directed everyone's attention to Figures 2-3 and 2-4 in the design manual and explained that recirculation of the Nitrex effluent may be accomplished by gravity, or it may require pumping, depending on the elevation of Nitrex relative to the nitrifying system before it. The proposed plan includes monthly sampling of the Nitrex effluent. 100% of the Nitrex effluent would be recycled until two consecutive months' BOD concentrations were reported to be less than 20 mg/L. For the first two months, 50% of the pre-treatment system's effluent would be directed to the Nitrex filter and 50% would be discharged to the PSND or BSF. After two months, 67% of the pre-treatment system's effluent would be directed to the Nitrex filter and 33% would be discharged to the PSND or BSF. This proposal is subject to change based on testing results.

Tim noted that the septic tank depicted in the plans in the proposed revised design and O&M manuals is depicted backwards, with the 1/3 volume chamber as the inlet end. He asked if this is proposed for only the Jamestown system or for all Nitrex systems? Russ explained that this is proposed for all systems with PSNDs or BSFs.

The group reviewed the proposed design manual, and agreed that the proposal to recirculate Nitrex effluent to the second compartment of the septic tank, constitutes a significant modification to the Nitrex system as approved by DEM. They asked about data from previous installations of this proposed configuration. Russ explained that Pio provided in his March memorandum to DEM, the data from the one installation at which this has been done, in support of this proposal. Russ circulated the memorandum from LAI in which this data was provided. The pre-treatment system in use at the home in Jamestown is not the same as the one for which recirculation was documented in the memorandum. There was concern about the BOD loading to a different pre-treatment system than that with which Nitrex effluent recirculation was successfully used. If the AX installed at the home in Jamestown can handle the additional BOD, will it require additional O&M?

The group thought that data from one installation is not sufficient documentation to support the proposal. There was general agreement that with data from only one example, the proposal is an experimental measure. As an experimental measure, there was support for field evaluation at the Jamestown home, since the system is already installed. If there is any problem, it has already been documented that the PSND will function if the Nitrex is bypassed, so the bypass remains a viable back-up plan if necessary. Data generated at this system could be reviewed and if recirculation appears to be effective, approval could be issued for implementing recirculation as proposed, on the other approved Nitrex systems. It was thought that data from the Jamestown system might be helpful as a rough prediction of the amount of time to elute the high concentrations of BOD. But since that Nitrex unit has already been in use, the data won't accurately reflect start-up conditions. However, important data could be collected to make a more informed decision on whether the concept should be used on other sites.

The influence of flow volume on the duration of start-up and the function of the proposed flow director was discussed because the Jamestown residence has low water use and low flow thorough the system. Without pressurized orifice flow, it wasn't understood how the flow could be accurately split as proposed in the draft revisions to the Nitrex design and O&M manuals. There was discussion of the flow director specified in the plan and it wasn't understood how it would accurately split trickle flow. It was also not thought to be adjustable to split flow 33% and 67%. Nikki looked up the device on the internet and the specifications do not include splitting flow 33% and 67%.

The TRC was in agreement that there is a problem that needs to be resolved and that the current single RI Nitrex installation is the place to generate additional support for the proposed method of resolving this problem. The TRC was in agreement that documenting the efficacy of the proposed recirculation is the first step that needs to be completed for them to acquire a level of comfort with this being applied elsewhere. If this were to be incorporated into other systems and there was a problem, DEM would have to acknowledge that this had been approved for use on the basis of results of its use with only one other system. This is a lot less documentation than that required of technology applications submitted to DEM, which must include a minimum of two year's data on at least ten systems.

There was discussion of how the proposed recirculation and associated equipment would be accommodated for systems that have already been approved by DEM. Brian said this would require submission to DEM of an OWTS Re-design Application.

George noted that they never observed BOD concentrations this high when the NEOWTC was monitoring the two Nitrex systems that were installed under the demo project. He wondered if the wood media in those two systems is different from the media that is currently being used.

Nitrex is only being proposed on complicated lots where there are no other options because of issues with drinking water wells, tight setbacks and separation distances and maybe even with DEM requiring a reduction in the number of proposed bedrooms. Designers need to be explaining to homeowners all the implications of these systems, including what they are going to look in the landscape, how high components might be installed with the grading to accommodate them changing the surface elevations and contours in the yard, extra pump chambers, and also the O&M requirements associated with use of the system.

Someone asked what Orenco has said about this proposal. Russ reported that Pio said that they had not been consulted but that he was certain that the AX could handle the additional BOD load. Everyone was in agreement that Orenco should be consulted about this and that if they agree that the AX can handle the additional BOD load, that they should send DEM a letter acknowledging this and also whether it would require additional O&M.

The group agreed that before the proposed recirculation is implemented in Jamestown, two actions that need to be accomplished are:

- 1) Provide more information on the flow director proposed, model(s), specification and how it will be ensured to split the flow as proposed.
- 2) Orenco authorization that the AX will be able to accommodate the additional BOD load and whether addition O&M will be required.

Once these two issues are addressed the TRC would be comfortable with implementation of the proposed recirculation of Nitrex effluent back to the second compartment of the septic tank at the Jamestown installation, with updates provided as observations of the system are recorded and data are obtained. (*Associated motion and vote on following page.*)

Motion: Noel made a motion for the TRC to recommend to DEM, that LAI be required to provide to DEM:

- 1) More information on the flow director proposed, model(s), specification and how it will be ensured to split the flow as proposed and
- 2) Written Orenco authorization that the AX will be able to accommodate the additional BOD load and whether additional O&M will be required.

Second: George seconded the motion.

Discussion: There was no discussion.

Vote: All who were in attendance voted in favor of the motion.

George suggested retrofitting the existing approvals with this recirculation, when there is evidence that it can work, but that new Nitrex permit applications not be considered until this has been demonstrated to work on all the currently approved systems. There was reaction that even this may be too aggressive and that maybe only select permit holders be included in an early trial of this measure. It was suggested that if someone is ready to start construction and this is the only way that their project can proceed, with the risk clearly stated, and an understanding that they system will be closely monitored, the homeowner might be willing to have their system installed with this experimental measure incorporated.

There was strong support for proceeding slowly, and carefully, because if it doesn't work, the homeowners will have spent additional money and still not have a solution for their lot.

Russ proposed use of the recirculation as shown in the draft revised design manual in Jamestown and if it works there, bring the proposal and data back to the TRC and discuss the next step. The group was comfortable with this.

George suggested that they perform flow calculations and use the PSND pump's lapse-time and cycle count to develop a better understanding of the system's function. If they install a pump and record forward flow for one day and the pump delivery rate is known, with the lapse time and cycle count, volume recirculated may be calculated. If this is performed at other installations, they would be able to report the time required with the recorded percent of a system's flow returned to the second compartment of the septic tank, to achieve Nitrex effluent BOD concentrations consistently less than 20 mg/L. It was suggested that this be requested of LAI when recirculation is incorporated at systems that have not yet been installed.

Table of Treatment System Attributes and Table of Approved AE Technologies' System Category, Type of Approval and Conventional Leachfield Reductions

Deb explained that she had initially developed the table of treatment system attributes to assist the TRC in their discussion of developing a method of assigning leachfield area reductions for conventional leachfields that takes into account more than the average BOD and TSS concentrations in a treatment system's effluent. The table that was provided for today's discussion incorporates modifications that were suggested by George and David Kalen via email and also during discussion at the TRC meeting December 14, 2011.

At that meeting, someone suggested that since we acknowledge two "Categories" of treatment systems (Categories 1 and 2) based whether a system incorporates time-dosing to the leachfield and the system's effluent quality, that maybe we should assign only two reductions to conventional leachfield area: one for Category 1 systems and another for Category 2 systems. To facilitate consideration of this alternative, Deb also developed a table of DEM approved treatment systems, listing Category (1 or 2), type of approval (TSS/BOD or N-removal), if preceded by a septic tank and the leachfield reduction that is currently allowed for conventional leachfields for each system. There are currently only three reductions allowed for technologies that are being used: 50%, 45% and 40%. So, maybe we could assign conventional leachfield area reduction based on whether the system is Category 1 or 2. But do we decrease the 45% reduction to 40%, or increase the 40% to 45%. Decreased reduction will be unfavorably received by the vendor, who will argue a reduction in marketability of the technology. Deb noted that if leachfield area reductions are reduced to two, 45% and 50%, the challenge she anticipates, is "what is the difference between 45% and 50%; why can't I have 50%?" Nikki agreed that this would be an issue for the vendors of technologies with a 45% reduction.

Brian noted that in the 15 or so years that this program has been approving technologies and allowing a reduction of conventional leachfield area, there has never been the need to expand the leachfield and make use of the additional area that has always been required to be shown on the plan submitted to DEM. He suggested that we could assign a 50% reduction for any technology that can meet BOD and TSS concentrations of 30 mg/L each.

Susan asked where the 45% came from. Russ explained the formula developed by Rein Laak at UCONN which uses average concentrations of BOD and TSS to calculate a leachfield area reduction. He reported that other states that allow reductions of leachfield area for advanced treatment technologies don't all do it this way. Some of them specify a maximum BOD and TSS concentration and if a technology's treated effluent can meet these, it receives the one fixed

percent reduction of leachfield area allowed in that state. Therefore, there is support for Brian's suggestion that we allow a 50% reduction for any system that can meet BOD and TSS concentrations of 30 mg/L each.

Brian emphasized that when the OWTS program is reviewing an application for a commercial system or one that will treat high strength waste, no leachfield reduction is allowed.

Brian recommended allowing a 50% reduction of conventional leachfield area for any system that meets 30 mg/L for both BOD and TSS, which is all the DEM-approved systems.

Russ stated that he accepts this proposal of a 50% conventional leachfield reduction for all approved technologies with BOD and TSS concentrations less than 30 mg/L each and asked for a TRC recommendation. Dennis asked what is driving the issue. This came out of a discussion of developing a more detailed analysis for assigning leachfield area reductions, but Deb explained that vendors consider a higher leachfield reduction to be a competitive advantage over technologies with lower allowed reductions. As a result, there have been requests for better reductions. This initiates a series of interactions involving requests for data, scheduling its review (including verifying that it is from systems in the configuration approved in RI) and inquiries from the vendor as to the status of the requested action. Brian added that leachfield reduction is not the system attribute that drives designers' decisions to specify one system over another. There was no support for retaining the current process, or for replacing it with a more detailed analysis. The group decided unanimously to support a single leachfield reduction of 50% for all approved advanced treatment technologies.

Technology Program Status Report

Deb distributed copies of the revised PolyLok certification issued March 20th, which includes the PL-525 and PL-625 with the previously approved PI-122 and the revised certification for ARC chambers, naming Infiltrator Systems, Inc. as the vendor and certification holder; this certification was issued March 19th.

Brian reported that on the effort that he and Jen Ryan have undertaken to account for all large systems' (systems with design flow greater than 2,000 gpd) compliance with reporting and performance requirements. Because of the large number of AX100s in this category, they began with these and have observed that there are conformed systems for which no service contract has been recorded and for which no data have been submitted. A letter was sent from DEM to Orenco March 16th requesting the data and service records for all AX100 systems installed in RI. As of the end of the day yesterday, there has been no reply.

Next Meeting

The group selected April 24, 2012 at 8:30 AM as a suitable date and time for the next TRC meeting. Deb will check with QDC on availability of the Annex and notify the group when she has secured a venue for this meeting.

Adjournment

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

The meeting adjourned at 11:05 AM.