

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

The meeting was held at
95 Cripe Street, North Kingstown, RI

March 14, 2013

Approved Minutes

Present: Russ Chateaufeuf, David Dow, Susan Licardi, George Loomis, Tim Stasiunas and Dennis Vinhateiro

Absent: Ken Anderson, Nikki Andrews and Noel Berg

Others Present: Blake Johnson (Orenco Systems, Inc.), Bob Johnson (Atlantic Solutions, Inc., Orenco Systems, Inc. distributor), Mark Fricke and Matt Lee (Aqua Test, Inc), Scott Hetrick (Norweco, Inc.) and Hollister Siegmund (Siegmund Environmental Services, Inc.) and Deb Knauss (DEM)

Others Present via Conference Call: Jason Churchill (Orenco Systems, Inc.)

Call to Order: 9:00 AM

Materials Distributed:

- Draft Agenda for this meeting
- Draft Minutes of 2/14/13 meeting
- Draft Class Two N-removal Technology Approval for Norweco, Inc's Singulair TNT and Singulair Green TNT
- Two versions of the Draft monitoring requirements for N-removal technologies approved under 37.4.2 (B)(i) and (ii): one incorporating the comments from URI (although they still appear as "comments") and one as it was received from URI
- A worksheet for considering sampling requirements for individual homes (of above draft monitoring requirements), and accumulation of data generated by early installations as the number of installations increases

Review of Draft Minutes of February 14, 2013

- Page 2, at the top of the page, second sentence: add an "s" to support: "The data submitted supports the claim that..."
- Page 2, add to the last sentence of the third paragraph, which begins "We want to require this of all N-removal...", "and to N-removal technologies that are not compliant with the reporting requirements of their certifications when they apply for renewal."
- Page 2, in the last paragraph before the motion and vote on Orenco Systems, Inc. AXRT Series (AdvanTex), add parenthetically "this is approximately 3,800 systems" to the following sentence: "Bob stated about 95 percent of them (this is approximately 3,800 systems). And at the end of the paragraph add: "Note: It was noted during review of these minutes in draft form at the TRC meeting March 14, 2013, that 5% of 3,800 systems (5% being the number of AdvanTex systems installed with out a discharge pump), is not an inconsequential number of these systems for which we don't know forward flow through the system and for which we can't calculate recirculation ratio based on forward flow, to optimize N-removal performance."
- Page 3, beneath "Monitoring Requirements" in the second paragraph edit as indicated: "Some homes with low carriage water produce high ~~treated effluent~~ TN concentrations while everything else reported is in the proper range. To consider a case like this, we could do a N-loading calculation and compare the result to an established loading threshold based on bedrooms. If the TN ~~concentration~~ loading is less than the threshold, with concentration outliers that are greater than the threshold of 19 mg/L standard, it is still a complying system."
- Page 3, in the last paragraph, add "and to calculate recirculation ratio, where applicable", to the end of the second sentence, which begins "This is why we need a pump or other method of recording forward flow..."
- Page 4, in the fifth full paragraph, beginning "Russ said that the vendor has a responsibility to get...", add: "George noted that based on his experience that this certification alone, does not indicate sufficient ability to operate AE onsite systems."

Motion: Dennis made a motion to approve the minutes with the corrections noted.

Second: George seconded the motion.

Discussion: There was no discussion.

Vote: All present were in attendance at the meeting February 14th voted in favor of the motion; Susan and David abstained.

Aqua Test, Inc.'s Application for The Nibbler

Matt Lee, President of Aqua Test, Inc. made a presentation on The Nibbler, following which he and Mark Fricke, also of Aqua Test, Inc., answered questions. Matt explained that the purpose of The Nibbler is to produce effluent with the waste strength of septic tank effluent. He explained that a fundamental consideration of their design guidance is correct assessment of the organic loading to a system and consideration of peak flow. He provided some data on the ranges of BOD5 and FOG concentrations from various commercial uses and explained that they guarantee the effluent quality of BOD5 < 150 mg/L, TSS <125 mg/L and oil and grease <20 mg/L at "operating capacity" and at "peak capacity", "BOD5 of <200 mg/L, TSS <150 mg/L and oil & grease <25 mg/L. To make sure that The Nibbler works, Aqua Test, Inc. works hard to make sure that each design is sized appropriately, so that it will meet the treatment parameters they warrantee.

Maintenance is required for the life of the system and service providers must be trained by Aqua Test, Inc. Service providers report activities, observations and results to the system owner, the regulatory entity and to Aqua Test, Inc. Matt explained however, that there are some Nibbler units that were sold by others, for which they have no oversight.

The Nibbler is composed of a series of pods within an aerated tank; it follows a septic tank, grease tank and a surge tank, which time doses The Nibbler based on average daily flow. The Nibbler is followed by a clarifier tank and a pump tank, and then a leachfield or an advanced treatment system. Multiple units of The Nibbler may be installed in parallel following a splitter basin. Matt stated that Aqua Test, Inc. doesn't specify which advanced treatment systems follow The Nibbler. They use odor gels to control odor, if necessary. The blower may be placed in a shed, or mounted on a light pole or on the side of a building and Aqua Test, Inc. provides installation support.

They use a design checklist for sizing each of the tanks with consideration of hydraulic flow (average and peak) and organic loading. Careful consideration of these factors and sizing appropriately allows the Nibbler to meet required treatment performance even at restaurants which can produce 50% of their weekly hydraulic load and cash flow over a 48-hour interval.

Matt explained the Washington, Minnesota and Oregon regulations (the states in which the application cites The Nibbler is approved), providing the greatest detail on Oregon. In Oregon, a water pollution control permit is issued for each individual system. The designer prepares a performance based permit application that includes monitoring requirements: monthly effluent sampling (which may be reduced to quarterly as a function of performance) and quarterly influent sampling. January 15th of every year, a report is due to Oregon DEQ; failure to fulfill this requirement results in a Class I violation of a \$10,000 fine. If a system exceeds the permitted flow, DEQ must be notified within two weeks.

Russ explained that RI doesn't require pre-treatment for high strength wastewater and asked about the incentive to use this technology under these discretionary conditions. Matt explained that he has observed failing commercial systems in RI. Currently the best solution that can be offered is to size a treatment system up and hope it is adequate to accommodate the waste strength. While these systems may be able to treat the high BOD concentrations generated at these commercial establishments, oil and grease are the biggest problem for these systems but The Nibbler is capable of treating these constituents. System owners become frustrated by serial failures. If a designer can specify The Nibbler to reliably manage the high strength wastewater, and the system can be retrofitted with additional units to accommodate growth or change of use, this is an improvement over current conditions.

George suggested that maybe a RI OWTS code revision could reflect the new paradigm of high strength wastewater, giving designers better tools to design for these uses.

Russ asked what requirements are imposed on them by the other states in which The Nibbler is approved. In Washington, there is an online database for water pollution control facility violations and the facility will be closed if it is not performing as required. Russ clarified that he is curious about the requirements that are placed upon Aqua Test, Inc. as the vendor of the technology. O&M providers sample the system and provide the information to Aqua Test, Inc. Aqua Test, Inc. informs the system owner of the condition of the system. If there is a problem and there is no response, Aqua Test, Inc. will send a letter to the permitting agency.

David asked if O&M providers are associated with the local dealer. Matt replied that anyone may perform O&M, but they have to be trained, although he acknowledges that the technical capacity for troubleshooting may not be an attribute that everyone has. However, Aqua Test, Inc. is able to work with video of system components' issues to identify problems and recommend the appropriate action to resolve the condition.

David asked if they anticipate regional satellite offices developing with the same authority that Aqua Test, Inc. has. Matt stated that he doesn't anticipate this yet, because there would need to be a huge number of installations to warrant this.

It was noted that the electric rate used to estimate annual power consumption in the application (0.06833 cents/kWh) is significantly lower than the rate charged in RI (about 6.8 cents/kWh). **Post meeting note:** Deb checked commercial electricity rates in WA and discovered that they are reported as **dollars** per kilowatt hour, not **cents** as in RI and also in the application, which makes the cost difference much smaller. A national map of June 2011 commercial electricity rates shows that WA ranges between 7.1 – 8 cents/kWh and RI >11.1 cents/kWh.

Russ asked about treatment claim (at operating capacity: BOD5 < 150 mg/L, TSS <125 mg/L and oil and grease <20 mg/L and at "peak capacity": "BOD5 of <200 mg/L, TSS <150 mg/L and oil & grease <25 mg/L) stated in the application being based on organic loading rate of 0.81 pounds per day BOD per pod, while the state of Washington approval letter states "200 gpd/pod with oil and grease concentrations ≤50 mg/L and 137.5 gpd/pod with oil and grease concentrations >50 mg/L. Matt explained that the treatment target has changed with time.

Washington's "daily treatment capacity" is the average daily flow, but he didn't know where they got that term.

George noticed that the surge tank has no override. Matt explained that in the surge tank, there is a 50% alarm and a 90% alarm. The 50% alarm is a tool for O&M providers (a courtesy notice of the 50% capacity condition in the surge tank). If the 50% alarm is activated on a Tuesday (early in the week for high volume) and there are no conditions that would produce high volume, it is indicative of a problem and they can call the service provider in to resolve the situation before the busy weekend. The 90% alarm is notification that something has to be done. If The Nibbler is paired with a technology with telemetry in the panel, alarms will result in a call to the service provider. In recent years, if the tanks are far away from the building, Aqua Test, Inc. has been requiring telemetry.

George asked if there are cycle counters at the 50% and 90% settings. Matt said that they add these at problematic sites.

The Nibbler is produced using a local concrete precastor's tanks. Aqua Test, Inc. sends their 3-foot by 4-foot aluminum access hatches to the precastor, so that they may be cast into the tanks. The Nibbler is installed with these access hatches at finished grade.

Russ stated that he thinks that The Nibbler could be accommodated by a fairly standard approval certification, including the performance claim, training requirements and O&M provider list, an O&M manual and testing requirements for system 2,000 gpd and over. He noted that it could be used with a conventional system installation to improve performance.

David asked if since Aqua Test, Inc. requires quarterly sampling, the certification could state that Aqua Test, Inc., is responsible for ensuring that the local service providers are meeting the service requirements and that there is a chain of command between the vendor, service providers and RIDEM.

George added that it is critical to monitor high strength wastewater. Matt stated that they require quarterly effluent sampling and that also collect influent samples if the system is violating the treatment objective.

Russ asked if the TRC would consider a motion to approve The Nibbler for any use and design flow, with all the standard certification requirements.

Motion: George made a motion to recommend approving The Nibbler with the certification to include all the standard provisions and the provisions discussed today.

Second: Dennis and David seconded the motion.

Discussion: George stated that we should include monitoring requirements for any size system as indicated by the vendor. David asked if it should be stated that when The Nibbler is used with another treatment system, that it must meet all of the requirements of that system. George stated that since the claim is defined in the certification, what residential waste strength will we use: 150 or 200 mg/L? Russ stated that he is thinking of using the definition provided in the application in the section "Technology Information" at C, Statement of Claim, which is: "*under the design organic loading rate of 0.81 pounds per day BOD5, the Nibbler will consistently produce an effluent with the following residential characteristics: at operating capacity BOD5 <150 mg/L, TSS <125 mg/L and oil and grease <20 mg/L; at peak design flow BOD5 <200 mg/L, TSS <150 mg/L and oil and grease <25 mg/L.*"

Vote: All present voted in favor of the motion

Norweco, Inc. Singulair TNT and Singulair Green TNT (N-removal) Draft Class Two Certification and Draft Monitoring Requirements

Deb noted that since printing the draft certification that she distributed this morning, she edited the first paragraph by adding "non-adjustable" as indicated: "The aeration system is controlled by a factory programmed, non-adjustable timer...".

She also explained questions that she had regarding various elements of the draft approval certification for Norweco, Inc.'s TNT (included in the draft certification as comments), some of which related to the proposed monitoring requirements. These included:

- In item 1) beneath the new section titled "Monitoring Requirements", how to specify the interval for which monitoring is required, accounting for all the potential outcomes: a) system clearly meets the N-removal standard, b) system clearly does not meet the N-removal standard, c) system is close to meeting the N-removal standard (how close is "close") d) RIDEM sees fit to modify the monitoring requirements as applied to the subject technology, e) RIDEM sees fit to extend/continue the monitoring requirements.
- What to call the monitoring requirements, so that the name may not be interpreted as more restrictive or broadly encompassing than intended. Deb suggested "Monitoring Protocol" and that it would be identified as an attachment to the certification, to which no one objected. Russ stated Monitoring Protocol is suitable for this and that if in the future some other monitoring protocol is established for another purpose, it will be named appropriately for its purpose.
- At item 3, beneath "General Design Requirements", Deb asked Scott Hetrick if the septic tank (identified as "pretreatment tank" in the details in the application) required to precede the TNT where design flow is 1,000 gpd and greater, is provided by Norweco, Inc, or the installer. Scott stated that the installer is responsible for providing this tank.
- Could we delete item 9 beneath "General Design Requirements": "System tanks, dosing chambers, pumping chambers,

and riser assemblies shall be field-tested for water tightness.”, since the item above it accomplishes the same intent and directs that water tightness testing be performed according to the procedures in the OWTS Rules? It was agreed that item 9 could be deleted. George recomended adding to item 8: “field tested and” as follows: “...and riser assemblies shall be field tested and be certified...”

- Deb deleted item 2 beneath “Reporting Requirements”, moving the statement regarding monitoring to the new section “Monitoring Requirements”.

There were no additional comments or questions on the draft certification.

Monitoring requirements

It had been decided that all systems installed would be monitored until the number required to obtain the minimum number of 40 samples had been installed. Deb wasn't sure if seasonal systems were desired to be sampled only twice per system and if so did both samples have to be taken during the same season; or were they desired to be sampled four times each, as are year round systems. Deb developed a chart to help guide discussion of the accumulation of data as each additional system is installed. On the chart, she included a text box addressing the issue of a seasonal system that is started up July 25th. It was decided that seasonal systems' first sample should be taken six weeks after start up and the final sample for the season should be taken before the end of August. However, six weeks after a July 25th start up is in September, after which some seasonal systems may already no longer be in use. So additional consideration is required regarding sequentially enrolling every installation in the monitoring protocol until the number required for the minimum of 40 samples and how to specify monitoring requirements for seasonal systems to account for mid-to-late season start-up.

Discussion regarding seasonal use acknowledged that it may not be possible to collect two samples during the first season for all of them.

At the time of the last discussion, it was intended that each system continue to be sampled until the minimum 40 samples is collected; this would result in some systems having more recorded observations than others. Another issue associated with this is, what if not many systems are installed: do we wish to accept 40 samples from only a few installations? It was decided that there must be a minimum of ten installations and a minimum of 4 data points for each, because 4 observations provides a better record of the performance variance for each system than only two.

Bob Johnson stated that it is difficult to budget for this if the number of samples required is not known at the start. Hollister asked if URI can do the analysis, hoping that the cost would be less than the \$175 charged by the analytical laboratory that performs analysis of Singulair systems' samples for SESI. George stated that URI can do this kind of third party sampling and analysis and provide a summary to RIDEM.

Scott Hetrick, asked if the NSF 245 certification is discounted from RIDEM consideration of the performance record of N-removal technologies that have this credential (Scott is new to the Norweco, Inc. application to RIDEM for Singulair TNT; the application has thus far been handled by two other Norweco, Inc. representatives). Russ explained the reason for requiring this sampling is not that RIDEM discounts the NSF certification, but that performance variability and total nitrogen concentration may be a function of forward flow and we are trying to understand this. Influent TN concentration is now understood to be higher than that on which our treatment standard is based. Scott estimated that fulfilling the requirements of the proposed monitoring protocol will cost between \$50,000 to \$57,000 at a minimum and stated that the more control the state of RI has over the process, the better it will be. He recommended that sample collection should be by a third party and since service providers may be associated with the vendor, they are not in all cases a third party. URI is clearly a third party, so collection of the samples by them is preferable to service providers performing the sampling. He stated that all systems subject to the sampling requirement should be sampled 90-days after installation and this should be adhered to strictly. Scott thinks that it could take three to five years for a technology vendor to complete this process. He added that when a homeowner considering the purchase of a system in this monitoring program, might consider the sampling objectionable and decide to purchase a system that is not subject to these requirements. If this happened, it would reduce the number of systems installed and delay completion of the required monitoring for that system.

Hollister asked what would be done if a technology isn't meeting the performance requirement. Would it have to be removed, or would the vendor be required to do something to resolve the performance deficiency? Russ stated he doesn't think that we'd require removal of the system except in very special circumstances where a specific level of performance is required by the permit, since we have never had to require a system to be removed.

Tim asked if we could require that each year round system be sampled four times per year, for one year and seasonal systems be sampled twice per season for two years, provided the systems are meeting the performance requirement. If not, then the sampling would continue until non-compliant systems' analytical results demonstrated compliance.

What if a system's average TN concentration is 20 mg/L, or 21 mg/L? How far over 19 mg/L is considered out of performance compliance? If the 5th sample hits 19 mg/L TN is that system now considered to be in compliance and relieved of further testing?

Jason suggested four samples be required for each site and require that after four samples are collected, if the average TN concentration is not 19 mg/L or better, that maybe there is no modification to the function of that system that can bring it into compliance. Maybe strong medicine is being taken by a resident in the home or the system is being abused. Russ explained that our purpose in obtaining forward flow is so we can consider loading and not just TN concentration.

Dennis suggested that after whichever sampling event after the 4 required for every system (5th, 6th?), if the average is in compliance with the standard, no additional sampling of the system would be required under this protocol.

What if all of a home's first four samples' TN concentrations are not 19 mg/L or better? If a person in a home is on chemotherapy, couldn't that be explained in an initial interview and that home declared ineligible for monitoring? Since we could reasonably expect that system wouldn't meet the treatment standard, why spend money collecting and analyzing samples when it is likely that a system won't meet the standard. Russ stated that we could accommodate a request to not sample if it is known that medication is being taken by a resident in a home that would be required to be sampled.

Discussion of when to continue beyond four samples and when to terminate a system's sampling:

System #1

Four samples are collected.

If the average TN concentration of four samples is 19 mg/L or better, that system must no longer be sampled.

If its average TN concentration is over 19 mg/L, do a 5th sample .

If this sample results in a five sample average TN concentration that is 19 mg/L or better, that system no longer requires sampling.

If the average TN concentration of five samples is not 19 mg/L or better, a 6th sample must be collected. However, how far off 19 mg/L remains a question (does TN average of 20 mg/L for 6 observations [or what threshold average concentration warrants either a 7th round of sampling, or investigation as to why it is underperforming: toxic shock medication-related issue, or other explanation over which the vendor has no control]). Perhaps that system becomes a loss: not working properly, not able to be remedied, but not indicative of the rest of the systems' performance.

Russ explained that there has been criticism of RIDEM's N-removal system requirements, which include repairs in N-sensitive coastal areas. It is important that we defend that the performance objectives are being met. We are sensitive to cost issues, but need to know how that the required performance is being obtained.

At 12:15 Russ acknowledged the time is past our usual end-time of Noon and sought agreement that we will continue discussion of this issue at the next meeting and that maybe we can meet sooner than one month from now specifically to conclude discussion of the proposed monitoring requirements. Scott asked if vendors might comment on the proposed monitoring requirements. Russ stated that we will accept any comments. Blake and Scott agreed that third party sampling is very important. Blake added that four samples from one home results in a four sample mean. If this home continues to be sampled resulting in eight samples, while a total of four samples are collected from another home's system: what is being used as "the" average used to consider the technology's compliance with the treatment standard? (The contribution of the eight-observations from one home to the universe of 40 observations is greater than four observations from another home).

David suggested that we require that 40 samples are obtained and use the average of that 40 to evaluate compliance with the treatment standard, with four from each home, unless a sample demonstrates non-compliance. Then, as Russ summarized in a previous meeting, if the system is demonstrated to be in compliance by subsequent sampling, the non-compliant observations will not be used to compute the 40-sample average.

Russ was asked to provide a summary of legislation that has been introduced involving onsite wastewater treatment systems. Russ summarized the various bills.

Next Meeting and Adjournment

The next meeting was scheduled for March 28, 2013 pending availability of a meeting venue, to complete discussion of the proposed monitoring requirements.

Motion: Tim made a motion to adjourn.

Second: George seconded the motion.

Discussion: There was no discussion.

Vote: All present voted in favor of adjournment.

12:37 PM adjournment.