The
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

January 26, 2012

Approved Minutes

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

Absent: Ken Anderson

Others Present: Deb Knauss (DEM)

Call to Order: 8:50 AM

Materials Distributed:
- Draft Agenda for this meeting
- Draft Minutes of 12/14/11 meeting
- December 29, 2011 Memorandum from Pio Lombardo (Lombardo Associates, Inc.) to Brian Moore

Review of Draft Minutes of December 14, 2011
Page 1: beneath "Review of Draft Minutes of September 27, 2011", the correct spelling of the last name of the J&R Engineering service provider, is "Moreau".

Page 1: beneath "Discussion of Rules 17.3, 37 and 39, edit the last phrase in the last paragraph replacing "but" with "the town" to read as follows: "the town ultimately decided not to implement this strategy".

Page 2: In the first sentence of the third full paragraph, "field" is spelled incorrectly.

Page 2: In the fourth paragraph from the bottom of the page, that begins: "Russ asked Brian what is being done…", "where" is spelled incorrectly in the second sentence.

Page 2: In the second paragraph from the bottom of the page, the state should be Maine ("ME"), not "MA".

Page 3: Beneath "Nitrex failure":
1) The system was installed in May "2011", not "2010".
2) In the first paragraph, where Pio Lombardo's name is first cited, add after Pio: "Lombardo (of Lombardo Associates, Inc, vendor of Nitrex)"
3) In the same sentence referenced by number 2, above, add after "Pio claimed that the": "failure occurred because the"…
4) In the same paragraph, correct, "under sized", to "undersized" in two places.

Page 4: Edit the last paragraph as indicated: "If ~~the same~~ a vendor ~~implements a~~ retrofits a design improvement to a group of their installed systems and the data from the retrofit systems is as good as or better than the data collected for the same systems in the originally installed configuration: that would be acceptable. The distinction that is crucial is that it must be the same vendor ~~tweaking~~ enhancing their own system and all the data generated ~~after the tweak~~ by the retrofit are comparable or better, not worse than the original configuration. The concern is a vendor making a claim that their system is similar to another vendor's system, but with some specific ~~tweak~~ modification and requesting approval on the basis of that comparison and ~~tweak~~ change. ~~The issue however still remains how much of modification do we allow under the definition of "tweak"?~~ In this instance the proposed change, although extensive enough to warrant a new application, seems amenable to retrofitting and may be accepted for review with only one year of data on the retrofit. The TRC may wish to reserve the discretion to make a case-by-case call on any future retrofit proposal provided the TRC reviews the proposal beforehand. No retrofits may be made without TRC review and State approval."

Motion: Tim made a motion to approve the minutes with the corrections noted.
Second: Susan seconded the motion.
Discussion: There was no discussion.
Vote: Noel abstained because he was not in attendance at the December 14th meeting. All who were in attendance at the meeting December 14th voted in favor of the motion.

Proposed Regulatory Changes to Address concerns of South County Towns

There has been some confusion following the press release issued by Representative Donna Walsh's office after the meeting with the South County municipalities and State Representatives that was attended by Russ, some other DEM staff and a couple of members of the TRC. Russ clarified that there will be another meeting of the South County municipalities, State Representatives, DEM staff and stakeholders, after which the proposed regulatory changes will undergo the stakeholder process for review and comment prior to their being promulgated and implemented.

The South Kingstown resolution asserts that denitrification requirements in South County have had a chilling effect on construction-related business. Specific issues have been proposed construction of breezeways, building foundation expansion, and addition of a second level, which may require upgrade of the OWTS serving the structure to a nitrogen removal system. There is particular frustration when smaller projects in the range of $10,000 to $20,000 trigger the upgrade requirement. An alternative considered was a point of sale (POS) upgrade requirement. Representative Walsh committed to exploring this option and will work with the General Assembly to consider if it could be put into effect in the South County Area. This was felt to be advantageous to the objective of protecting the salt ponds, because there are more home sales that there are home improvements.

In the meeting it was suggested that for a couple of years all improvements be allowed without requiring upgrade of the OWTS and add a clause in the Rule (perhaps the "50% Rule") that if the structure is served by a cesspool the existing triggers remain in force. Or, in the Salt Pond and Narrow River critical resource areas consider a sunset on the Rule and after maybe a two-year period, revert back to the upgrade Rule, something similar, or replace that provision with POS, if a POS law is enacted.

Another issue is the technologies themselves, the number of approved options and their costs. Maryland and Massachusetts nitrogen removal requirements are similar to ours and DEM found that our system costs are similar to the cost of nitrogen removal systems in these other states, at about $25,000 in all three of these states.

Another concern expressed at the meeting was how do we attract other businesses to apply for technology approval? The resolutions seek for DEM to pursue applicants. Russ asked if soliciting business was thought to be a proper role for DEM and it was thought that it is not, but that municipalities could fulfill that role. DEM could prioritize these applications and work with the vendors and the municipalities to expedite approval of these technologies.

Also considered was how to accommodate technologies that have been approved in other states with very similar approval requirements to ours. This would reduce the burden on the applicant to submit all the data and other support of the technology. However, they would still have to develop and obtain DEM approval on a RI-specific design, installation and O&M manual and all the approval certification terms including required testing, follow-up and reporting would still apply. There is a perception among the group that more technology vendors may apply if such a program were adopted.

Russ said that DEM will work on modifying the Rules to accommodate these requests and another meeting of the municipalities, representative and others, will be scheduled in March for discussion of the draft language developed to accommodate these alternatives.

Someone asked Russ if the POS provision discussed at the meeting is limited to cesspools or if it would apply to all systems and he responded that it would apply to any non-denitrifying system in the salt pond and Narrow River critical resource areas.

Nitrex failure

Russ updated the group on the Nitrex system that was installed in Jamestown on a very sensitive lot with well variance issues among others. The system was installed in May 2011, the family moved into the home in June 2011 and the PSND failed within months. Russ was able to report on analytical data for a single sampling event in August:

Influent (untreated ***to*** AdvanTex)
Total Kjeldahl Nitrogen 27 mg/L

AX Effluent (***out of*** AX, ***into*** Nitrex)
Total Kjeldahl Nitrogen 5.0 mg/L

Nitrex Effluent (***out of*** Nitrex)
BOD 190 mg/L (PSND standard is 30 mg/L)
Total Nitrogen 4.95 mg/L
Total Kjeldahl Nitrogen 4.9 mg/L
Nitrate 0.1 mg/L
Nitrite 0.01 mg/L
Ammonium 0.64 mg/L
Total Suspended Solids 19.0 mg/L

When it was determined that the Nitrex unit was discharging elevated BOD concentrations, the AdvanTex AX unit was configured to by-pass the Nitrex and discharge directly to the PSND and the PSND was monitored for ponding. Effluent is no longer ponded in the PSND. However, we don't know the strength of the wastewater entering the PSND from the AX, so more testing of the AX effluent will be performed.

Russ called everyone's attention to the December 29, 2011 response from Pio Lombardo of Lombardo Associates (manufacturer and vendor of Nitrex) in which he proposes measures to mitigate the elevated BOD concentrations that are being eluted from the Nitrex unit during startup. Pio feels that the leachfield is not properly sized: in Massachusetts where Nitrex discharges to conventional leachfields (rather than PSNDs and BSFs) he hasn't had problems with the elevated BOD concentrations during the startup interval.

Included in Pio's proposal is a plot of BOD concentrations against time. The longest interval reported for a system to achieve a BOD concentration consistently below 30 mg/L is about 250-days. Time required to achieve fairly consistent BOD concentrations, that meet the required treatment performance of 30 mg/L for discharge to a PSND will vary as a function of several variables, including water use. Water use at the home in question is low, at less than 100 gallons per day.

Russ read from the RIDEM approval certification for Nitrex, general design requirement number 4, which requires that "*in any critical resource area associated with the south shore coastal ponds or Narrow River, the Nitrex™ Filter System shall be required to employ a pressure dosed shallow-narrow drainfield or bottomless sand filter*." The Nitrex performance data submitted with the technology application indicated that Nitrex could achieve the treatment objective required for discharge to these leachfields. This requirement has been incorporated in nitrogen removal technology approval certifications since January 2006 and the policy allowing the use of conventional leachfields with RIDEM approved nitrogen removal OWTS technologies in the Salt Pond and Narrow River Critical Resource Areas was issued in October 2008, after the February 2008 issuance of the Nitrex certification.

There was discussion of the measures that Pio recommends in his December 29, 2011 proposal for mitigation of sites that are sensitive to elevated BOD concentrations (these proposed measures are listed below). It was asked whether there was any data demonstrating the efficacy of these proposed measures and noted that lacking such support, these are essentially experimental measures that are being proposed. There was also concern about the additional cost of these measures and by whom these costs would be absorbed. In the case of the currently considered installation in Jamestown it is not known by whom the cost would be covered. For new installations, it is expected that the cost would be included in the cost of the Nitrex unit.

1) Compartmentalization of the Nitrex tank allowing for phased startup of one compartment at a time. There was concern that this would prolong the interval over which the Nitrex may be expected to elute elevated BOD concentrations and there were no details included for implementing this measure.
2) Recycle line from Nitrex back to nitrifying pre-treatment system.
3) Polishing filter (sand or media) with a hydraulic loading rate 5-times that of typical design for secondary treatment.
4) Post-aeration in a pump chamber and/or aspirator added to drainfield dosing force main.
5) Tablet chlorination to prevent biomat formation, during startup only.
6) Drainfield ponding monitors to alert operators in the event ponding occurs.

Russ explained that he had found two common applications for tablet chlorination units:
1) in surface irrigation systems and
2) where a fairly clean effluent is being discharged and there is concern about not achieving sufficient bacterial die-off in a leachfield lacking delayed infiltration to the subsoil because only thin biomat or no biomat develops.

But that he hadn't found documentation of use of these units for reduction of high BOD concentration in onsite wastewater treatment system effluent.

George explained that the New England Onsite Wastewater Training Center was responsible for writing the disinfection chapter of the Onsite Consortium of Institutes for Decentralized Wastewater Treatment's curriculum for the national installer certification program. He therefore has a good understanding of tablet chlorinator function, malfunction, and the potential consequences of their use. He explained that if the tablets become moist in the columns from which they are dispensed, they fail to drop into the solution through which the effluent flows to release the active chlorine. He also explained that the chlorine is a strong oxidizer and that it will be damaging to the pumps. Additionally, residence time is required for the chlorine to work and Nitrex's discharge to the PSND doesn't provide this residence time. High concentrations of BOD (organics) may combine with the chlorine to produce chlorinated organic compounds and native soil aerobes on which we are depending to provide additional treatment in the soil, could be killed by the chlorine. He recommended not considering this option.

Russ reported that Nitrex has been installed with sand filters following it, functioning as polishing filters and Pio reports that these have been dosed at 25 gallons per day per square foot, which is a much higher loading rate than 3.5 gallons per square foot per day, the highest BSF loading rate in RI guidance. Because of this, Pio thinks that the problem

experienced at the Jamestown system wouldn't happen during startup with a BSF, but he states that he'd require sieve analysis of the sand to ensure the material meets the specifications of ASTM C-33 sand. George stated that we use a modified version of ASTM C-33 sand. ASTM C-33 allows up to 70% fines passing a 200-mesh screen; we allow no more than 1% fines to pass a 200-mesh screen. If he has been using ASTM C-33 sand, this media can have a much greater presence of fines than the sand media we allow in a BSF. George also stated that that a BSF lacks the benefit of natural soil structure as beneath a PSND, where the natural planes of weakness between the soil peds allow for better water and gas movement to help process organics present in the effluent that is discharged to a PSND. A BSF is composed of inert material with no natural bio-community as is present beneath PSNDs. George doesn't think that use of BSFs with all Nitrex installations is a tenable solution to the high BOD issue.

George said that with regard to the proposal to recirculate Nitrex effluent, Pio would have to provide data demonstrating that this process works.

The group considered the terms of the Nitrex approval certification and temporary modification of some of the certification's terms until a solution is implemented in Jamestown and is observed to be effective. There was discussion of the certification's allowance for reduced leachfield area: the certification allows Nitrex the reduction of required leachfield area for conventional leachfields that is assigned to the pre-treatment system preceding it. But with consideration of the elevated BOD concentration issue, it isn't prudent to allow the reduced leachfield area with conventional fields since the reduction is based on effluent quality.

Deb will look at whether MA allows a leachfield reduction for Nitrex.

It was suggested that the Nitrex effluent be pumped to the PSND, so that we know how much water is actually being used.

Motion: George made a motion to temporarily suspend use of Nitrex with PSNDs and BSFs, until further notice from DEM that the elevated BOD concentration issue has been resolved.
Second: Susan and Dennis seconded the motion.
Discussion: There was no discussion.
Vote: All who were in attendance voted in favor of the motion.

The second issue to consider is the issue of leachfield reduction. The certification allows Nitrex reduction of required leachfield area for conventional leachfields as assigned to the treatment unit that precedes it. It was noted again that this reduction is allowed because of the low BOD and TSS in the treated effluent and that under the conditions that have been observed at the Jamestown system, a full size conventional leachfield should be required with Nitrex.

Motion: Tim made a motion to allow only full-size conventional leachfields with Nitrex, until further notice from DEM that the elevated BOD concentration issue has been resolved.
Second: Nikki seconded the motion.
Discussion: George reminded the group that there is no way to know forward flow through a system with gravity discharge to a leachfield, which is important for calculating recirculation rate to maximize denitrification, but also to quantify water use especially in a situation where there have already been problems. After a bit of discussion regarding the merit of requiring pumping to the leachfield, it was decided that pumping to the leachfield would not be required.
Vote: All who were in attendance voted in favor of the motion.

Technology Program Status Report
Deb reported that the PercRite certification was issued January 9th, but that she had neglected to email it to the TRC and also did not bring copies today. She will email the TRC this certification and the cover letter documenting her communication to American Manufacturing regarding their remaining responsibilities regarding manuals and training.

The next certification to be written is Fusion.

Other: Question on the Singulair DN certification and use of the Singulair Green (plastic) tank
George asked for clarification of the Singulair DN certification and use of the Singulair Green (plastic) tank. Deb explained that the TRC had agreed that the Singulair Green (plastic tank) for TSS and BOD reduction was the same tank configuration and same function as the originally approved concrete Singulair and therefore it could be approved for that use. The parent company (Norweco, in Ohio) had requested approval of the Singulair Green and wanted the certification to be issued to them naming Siegmund Environmental Services (SESI) as the exclusive distributor. The renewed and revised certification for use of Singulair for TSS and BOD reduction, which allows use of both the concrete and plastic (Singulair Green) tanks, was issued to Norweco, naming SESI as exclusive distributor. Since the original certification for TSS and BOD reduction had been issued to SESI, Deb had requested and received a letter from SESI acknowledging and agreeing to this change. During the TRC meeting at which both Don Bach of Norweco and Hollister Siegmund of SESI were in attendance, Tim asked about whether the Green Singulair plastic tank could be used in place of the concrete Singulair tank in the SESI Singulair nitrogen removal system's treatment train (the SESI

nitrogen removal system recirculates treated effluent from a pump chamber following the unit, back to the first chamber of the treatment tank or to the inlet pipe). Hollister liked the idea, because the plastic tank is less expensive and easier to move around. Don Bach stated that Norweco would approve of this use. Deb obtained an emailed letter of approval of use of the Singulair Green tank in the SESI Singulair nitrogen removal system from both Don Bach of Norweco and from Hollister Siegmund of SESI. The nitrogen removal certification that was issued to SESI February 5, 2010 and revised June 17, 2010 (to correct the threshold and sizing of an anaerobic tank preceding the Singulair DN), was revised December 9, 2011 to include use of the Singulair Green tank where design flow does not exceed 600 gallons per day and where seasonal high groundwater table conditions are appropriate. ***Norweco's*** Singulair Green TNT nitrogen removal system could not be approved because it relies on an on-off aeration cycle rather than recirculation (as in the RIDEM-approved SESI variant) to effect denitrification and Norweco had no performance data to support a Class 2 application. The important thing to keep in mind is the design flow limitation of 600 GPD for the Green tank and also the seasonal high watertable/anti-flotation issue.

Next Meeting

The group selected February 28, 2012 at 8:30 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 meeing.

Adjournment

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

The meeting adjourned at 12:05 AM.