

**INNOVATIVE/ALTERNATIVE SEWAGE DISPOSAL TECHNOLOGIES
TECHNICAL REVIEW COMMITTEE (TRC)**

The meeting was held at the South Kingstown Town Hall

March 23, 2007 Meeting Minutes

Draft

Attendees:

TRC members present: Noel Berg, Russ Chateauf, Susan Licardi, George Loomis, Tim Stasiunas and Dennis Vinheiro, Dave Burnham, Ken Anderson

TRC members absent: Joe Frisella

Others present: Deb Knauss, RIDEM, Pio Lombardo and Steve Corr of Lombardo Associates, Inc., Diane Johnston of Charlestown Waste Water Management Office

Meeting came to order about 8:45 AM

Materials distributed:

- Draft Agenda for today's meeting
- Draft Minutes of 12/1/06
- IAPMO Material and Property Standard for Prefabricated Septic Tanks
- Letter to Coon Manufacturing RE: Poly tank application

Motion: Dennis made a motion to accept the minutes with grammatical corrections noted in print by George.

Second: George seconded the motion.

Vote: All present who were present at the December 1, 2006 meeting voted in favor (Noel Berg, Susan Licardi, George Loomis and Tim Stasiunas and Dennis Vinheiro)

Nitrex Nitrogen Removal Application

Pio distributed a summary specifying how the Nitrex application compares to the RI requirements for approval of a Class 2 Technology and briefly presented its contents to the group.

Treatment Performance for Which RI Approval is Being Sought and for Which Nitrex Approvals Have Been Issued

Application claim is less than 10 mg/l TN in the Nitrex effluent. Russ asked Pio if approval is being sought for this TN concentration of less than 10 mg/l, or for 19 mg/l and 50 % reduction, as is now the standard reduction acknowledged by the RI nitrogen reduction approvals. **If RI can approve Nitrex with an effluent quality requirement of 10 mg/l TN this is LAI's preference.**

AZ: The Arizona approval issued in August 2006 acknowledges ability of Nitrex to meet the requirement of **10 mg/l TN**.

DE: Delaware acknowledges ability of Nitrex to routinely reduce TN (TKN + NO₃ + NO₂) to below **10 mg/l**.

MA: Pio and Steve explained the reason the provisional approval MA issued for Nitrex **is not for 10 mg/l** as being that there is no General Use Approval in the rules for that level of treatment performance, the best nitrogen removal treatment efficiency for which a General Use Approval has been issued is for RUCK for TN of 19 mg/l. If after three years of use under the Provisional Approval, 75 % of the Nitrex systems installed are meeting 10 mg/l TN, a General Use Approval can be issued for Nitrex for 10 mg/l. If that is not the case, but 75% of the systems installed are between 10 and 19 mg/l, the General Use Permit could be issued for Nitrex for 19 mg/l TN.

MD: In Maryland, Nitrex is approved for the grant-for-Best Available Technology system-use program under the Bay Restoration Fund. Nitrex meets the required TN standard of 50 % reduction or an effluent of 20 mg/l or less based on an influent of 40 mg/l or greater.

Treatment Performance of Pre-treatment System Preceding Nitrex

Pio clarified that the system preceding Nitrex must achieve a TKN effluent concentration of less than 5mg/l, considered "complete nitrification", not "100% nitrification" as is stated in at least one place in the application due to an administrative oversight. There was concern with this requirement, because RI's approvals for these systems do not specify a TKN concentration. Pio explained that **LAI enters into an agreement with the vendors of the approved pre-treatment systems specifying this performance requirement.**

Responsibility for O & M for Entire Treatment Train

Pio explained that LAI is responsible for the entire treatment train, from the building sewer to the drainfield. It was explained to LAI that in RI it is unlikely that the Nitrex unit will be preceded by an RSF; it should be expected that the Nitrex unit will be preceded by a proprietary system. Would the LAI service providers be trained for O&M by the vendors of the systems which will precede the Nitrex unit? Pio explained that LAI enters into a legal agreement with service providers who in their opinion do the best work, whereby they are LAI's O&M subcontractors. O & M will be provided contractually by LAI, through agreement with the vendor of the pre-treatment system; service will be performed by vendor's approved service personnel.

Pio stated that in Oregon training of designers and installers has recently been completed and OSI offered to incorporate the Nitrex and OSI training.

If a system does not perform to required effluent quality, the **warranty** requires that a diagnostic report is prepared. If the system is operated at the designated flow for residential use and is sized and operated properly the system will perform to claim. The application provides an example of LAI's involvement with a repair situation in which Nitrex was a purchased add-on type component. The system is in Bel Air, MD: The final effluent was not meeting the permit requirement. LAI recommended that the pre-treatment system in place, which was not nitrifying to the extent required, be replaced by an RSF which would provide sufficiently nitrified Nitrex influent for the system to achieve it required effluent quality. In this case, LAI did not have authority to make the substitution; they were providing one component of a solution.

Media

In response to concern regarding the vagaries of the application regarding the treatment media, Pio explained that preparation of the media is an art and must take into consideration what is available. LAI inspects media for suitability; specifically Professor Robinson is responsible for media selection and preparation.

There was concern expressed by TRC members that **removal of the media** will not be performed as easily as the application states, specifically, that removal of the media would be performed by a pumper. Based on TRC members' knowledge of pump truck equipment, pumpers would not take the job, because the wood material would clog the line. Alternatively sewer vacuum trucks would be able to physically handle removal of the material, however a significant issue which must be surmounted is vacuum truck access to the tank. The trucks do not have long hoses and cannot be parked directly over the Nitrex tank and vacuum truck operators are unlikely to accept the liability associated with doing so. The issue of **expended media disposal** is another problem; receiving stations will not accept the material, which would be classified as bacterially contaminated "green waste", solid waste or a "special" waste.

Pio several times emphasized that the media is estimated to remain viable for twenty years, but that they expect that the functional life of the media will be more like twice this estimated term. He offered that if the group is uncomfortable with the issue of the term of the media life and the removal and replacement issues that he would add a five-year media life clause and replacement within this term at LAI cost to the warranty. He stated that as LAI's opinion is that the media life will be longer than twenty-years that for additional cost LAI will increase the media warranty to ten years.

LAI will ensure that the media can be easily replaced with a vacuum truck.

In Malibu media replacement cost was calculated; LAI could provide description of media replacement process.

Nitrex Tank Model Numbers Specified in Sate Approvals

MA: The model numbers specified in the MA approval are associated with design flows.

DE: The model numbers specified in the Delaware approval designate systems by design flow (the first three digits) of 300, 450 and 600 gallons per day, the two digits preceding the "R", designate the concentration of TN removed by the Nitrex unit, for example: 450-20-R designates a Nitrex unit which will handle 450 gallons per day design flow and remove TN from 30 mg/l influent to 10 mg/l treated effluent. Also, the 450 and 600 models can be used for high strength uses, such as office buildings and restaurants.

Estimated Costs

Pio estimated that the Nitrex unit to serve a three or four bedroom residence can be delivered to a bedded excavation for between \$4,000 and \$5,000.

The cost estimates provided for all necessary components of the treatment train were thought by many TRC members to be well below expected purchase and construction costs for RI.

Responsibility for Supplying System Equipment for Installation

Inconsistencies regarding LAI supplied equipment and equipment to be provided by the Installer in the Draft Design and Installation Guidance were identified. Pio stated that the table in the application was prepared for an actual contract and the costs and parties providing specific equipment was known.

Compatibility of the Control Panel with Nitrex and the Pre-treatment System: Pio stated that the Nitrex unit is integrated into the Telecomm or Vericomm panel.

Provided Equipment and Design and Installation Detail

Installation of the temperature sensor, provided by Nitrex, performed by installer;

Junction box within the Nitrex tank: application must provide detail.

Flow meter: if required, as in the case of a large cluster system, the meter is provided by LAI.

It was requested that if an approval is issued, that in the final Design and Installation Manual, that these issues be specified in detail.

Seasonal operation implications for Nitrex: LAI explained that testing was performed at the MA Test Center to simulate seasonal operation. During these tests TN removal remained at less than 10 mg/l in the Nitrex effluent. LAI's concern is with the performance of the pre-treatment system under these conditions, because the nitrifying bacteria are temperature sensitive.

Engineer of Record – Design and Construction

Pio explained that during design, and installation **LAI is the engineer of record and the construction manager** working with technical field people.

Pio explained that because of the LAI warranty, that LAI must be the contract holder, for at least the first two years, as the warranty states that LAI must review all designs. It was noted by a TRC member that the warranty specifically excludes design errors, which seems contradictory to the requirement that LAI must review designs. Pio relied that he will review for gross errors, he stated that the distinction is "observation" versus "certification"; **Pio is not "certifying" the correctness of the design; the engineer of record is responsible for the correctness of the design. Pio said that PAI must be the engineer of record for cluster system designs.**

Tanks – regarding the statement in the application "concrete tanks or other prefabricated tank":

Pio stated that LAI is seeking approval for use for the Nitrex unit to be constructed of any state-approved tank. And that for a single family residential design LAI provides the Nitrex tank; the contractor provides the bedded excavation.

Pio explained that some of the Nitrex units installed were created of tanks with a baffle; this was done for their interest in collecting performance data for this hydraulic control configuration.

Pio provided description of the Nitrex tank in response to several questions asked by the TRC and Deb. *Summary:* The media completely fills the tank. Pre-treated (nitrified) effluent enters the tank and flows upward through the media. Media is prevented from exiting the tank by screened pipe. Liquid level is maintained at the invert of the effluent pipe.

It was asked how the homeowner will know when the media must be replaced; Pio replied that the O&M provider will know.

Monitoring Frequency

The monitoring frequency required by LAI for the first two years is quarterly. Although the application states that thereafter the systems are to be sampled annually, Pio stated that there should be a statistical basis for additional performance monitoring.

Seasonal Use & Recirculation at Start-up

Pio stated that following intervals of no flow, RSFs recover the ability to nitrify fairly quickly. He was informed that there are not many RSFs being installed in RI and that he will have to contend with the ability of proprietary advanced treatment devices to nitrify under seasonal use conditions.

Start-up

Regarding "start-up", Pio stated that the issue with the Nitrex unit during the "start-up" interval is high BOD, and that recirculating the Nitrex effluent back to the pre-treatment system reduces the BOD concentration and that the media is generally washed of the excess BOD within three months. **Recirculation at start-up, was described by Pio as being necessary only for installations performed in winter or fall.** For example, if a Nitrex unit is installed in October, the system should be run in recirculating configuration. **The installer will have to be provided instruction for how many days to run it and the flow at which to run the recirculation.** If the system were constructed in May it would not be required to recirculate. Pio stated that some states have a defined start-up interval during which a system is not required to perform to the terms of its permit, asked if such a provision exists in the RI regulatory structure and was informed that there is not.

Recirculation with equalization volume in the pump chamber may require some flow to be bled-off to the drainfield; hydraulics would have to be maintained for a PSND or a BSF.

Initial pre-treatment step – 35 mg/l BOD – do we want to size the drainfield down for the Nitrex unit? **It was clarified that LAI is not seeking a 50 % reduction in addition that allowed for the pretreatment system.**

Alkalinity – Source Water Analysis

Alkalinity – Pio – recirculating media filters are approved for use by LAI unconditionally, but proposed use of a single pass filter requires verification of the alkalinity of the source water. This analysis must be provided to LAI by the designer proposing use of the single pass filter. Pio reported that LAI is working on a method to enhance alkalinity for systems at sites with low source water alkalinity.

Correction

George noted that the statement on page 9 in section “V. Design Criteria”, subsection D.2. “discharging to a water body” must be deleted.

RIWIS Update

George reported that the communities were the driving force behind the continued development of the statewide ISDS data and system management tool using Carmody. If a community wishes to participate, they contact Carmody and request that they be included. URI then works with data provided by DEM to format the data for the specific needs of the community; the data are then exported from URI to the municipality. URI and DEM will begin working in mid-April on the data transfer process.

URI CE Water Quality (NEOWTC & RI-NEMO) has planned an event in collaboration with Carmody, “Starting a Local Wastewater Management Program Using RIWIS” for May 18, 2007. Registration and information on the event and the benefits of RIWIS is being sent to communities and posted to the URI CE Water Quality website; DEM will post a link to it. George distributed this material.

Large System Tracking

George distributed copies of a letter sent to Tim Cranston, North Kingstown Water Quality Specialist, in reply to a request by Tim for third-party review of treatment performance of a 4,500-gpd system incorporating an RSF. There are data gaps and the system is out of compliance with the nitrogen reducing technology’s requirements. This system serves as an example of the benefit of community involvement in RIWIS, as the system can be set up to manage large flow systems, organizing data, generating treatment performance reports and facilitating comparison of data with requirements for the technology or systems’ permit requirements. George cited the example of George Heufelder’s use of Carmody: laboratory data is fed directly to the system and hard copy is sent to Barnstable County.

ASABE Conference

George distributed a memo dated February 21, 2007, which was sent to the NEOWT Steering Committee regarding development of an onsite wastewater tour in association with the American Society of Agricultural and Biological Engineers 11th National Symposium on Individual and Small Community Wastewater Systems, which will be held in Warwick, October 20 through October 24, 2007.

George emphasized the significance of this event among industry professionals as being greater than all other national events with the same target audience and similar issue focus, due to their commitment to presenting cutting edge developments in these fields of study and industry.

He explained that traditionally tours are offered as part of the program and that the ASABE has asked the NEOWT program to develop, coordinate and conduct an onsite wastewater tour. George is looking for help and support from the TRC with technical and logistical issues associated with this tour, as well as recommendations of potential sites in addition to the tentative list of commercial and residential sites compiled by OWT staff with assistance from Brian Moore of the DEM ISDS Program.

Motion: George made a motion to adjourn the meeting.

Second: Noel seconded the motion.

Vote: All present voted in favor.

The meeting adjourned at 12:50 PM.

Next Meeting

Next meeting was scheduled for April 27, 2007, at **8:30** at the South Kingstown Town Hall at 180 High Street in Wakefield.