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

The meeting was held at the South Kingstown Town Hall

December 14, 2007 Meeting Minutes

Draft

Attendees:
TRC members present: Ken Anderson, Russ Chateauneuf, Joe Frisella, Susan Licardi, George Loomis, Tim Stasiunas and Dennis Vinhateiro

TRC members absent: Noel Berg, Dave Burnham

Others present: Santa Claus; Deb Knauss, RIDEM,

Meeting came to order about 9:10 AM

Materials distributed:

- Draft Agenda for today's meeting
- Draft Minutes of March/23/07
- Certification and cover letter – OSI RE: PVU series Biotube pump vault replace discontinues SVT series
- Certification and cover letter – F.R. and Mahoney Associates RE: Amphidrome Cl-II N-removal
- Small spreadsheet calculation of new loading rate for BSF maintaining area using new wastewater flow from 08 rules
- Letter from Pio Lombardo to D. Knauss dated 6/14/07 (reply to D. Knauss letter of 5/25/07)
- D. Knauss letter to Pio Lombardo dated 5/25/07

Motion: George made a motion to accept the minutes.
Second: Tim seconded the motion.
Vote: All present who were present at the March 23, 2007 meeting voted in favor (Susan Licardi, George Loomis, Tim Stasiunas, Dennis Vinhateiro and Ken Anderson)

Amhidrome Class II Nitrogen Removal Approval
Russ summarized the approval issued for Amphidrome October 10, 2007. The technology is approved with no design flow restrictions. The only change from the previously agreed upon terms of the approval was to increase the reduction in leachfield area from 40 percent to 50 percent, based on data subsequently submitted, demonstrating TSS and BOD removal of similar efficiency to other approvals receiving the 50 percent reduction, in addition to the documented 50 percent nitrogen removal and final TN concentration of 10 mg/l. The Vendor must be involved in every design and installation. In MA most of the Amphidrome installations are large systems, although there are some residential installations. In RI, Richmond Commons, a 100,000 gpd system, is using Amphidrome. The requirements for this installation are TN no greater than 10 mg/l, in addition to a P removal requirement. Siegmund Environmental Services, Inc is the designer of this system.

Leachfield Requirement With Advanced Treatment in SAMP Areas
There are requirements in some of the technology certifications to use in SAMP areas a PSND or a BSF. The decision to make this a requirement was made at a time when the onsite rules did not require nitrogen removal; at the time nitrogen removal technology was used when site constraints necessitated it.

The 1/1/08 rules will require use of nitrogen removal systems in critical Resource Area salt ponds and Narrow River for repair applications as-well-as new building construction applications and statewide in welled areas on lots with area of less than 20,000 square feet with 345 gpd design flow. Installation of a nitrogen removal system will allow design of a 345 gpd system on a lot smaller than the 20,000 square foot minimum for this design flow, as an alternative to reducing the flow for the system to two-bedrooms.

Concern: how does the state deal with the **cost of these nitrogen removal systems**? One factor contributing to their high cost is the cost associated with the design, materials and installation of BSFs. Russ sought TRC comment on allowing **other leachfield options in these areas with nitrogen removal systems, provided they could be designed in compliance with the siting provisions of the rules.**

Decrease spacing between lines (SNDFs)

- Spacing less than 5 ft on ctr. Acknowledged that in 1996, when design parameters were developed it was thought that in the event of a failure the space between the lines could be used for the repair installation. Some PSNDs would not fit with 5 foot spacing,

but as **repairs were approved with spacing as low as 2-1/2 feet between lines (to the best of his recollection) and that these were installed with mini-excavators with no problem and that he has experienced very few problems with these fields**.

- Decreased spacing **would allow use of the PSND on more sites**, PSND provides better treatment than the BSF: additional N removal and nearly complete P-retention, as demonstrated by the work of Stolt and Holden (S & H), where a BSF provides no additional N removal. Initial ST eff N concentration of 60 mg/l, and for example the AX reduced this to 30 mg/l. 30 mg/l remains in the treated effluent, a PSND has been observed to remove 30 – 70 % of this residual N. It was noted that in addition to the treatment performance of PSNDs, there is the issue of aesthetics, as most homeowners consider BSFs to be unsightly.

- Cost of PSND was discussed: With reduced line spacing to 2-1/2 feet could be installed with mini-excavators (3 feet between the tracks), where a standard excavator would create a mess – the issue that not all installers have the small excavators was acknowledged.

- Tim noted that with typical installations, the entire bottom of the leachfied must be exposed for a Department bottom inspection, if required by permit and that for the Demo-project work, the fields could be constructed one trench at a time.

- Additionally, George reported that although PSND had not been considered as a pathogen removal device, Jim **Converse's work shows pathogen reduction beneath PSNDs.**

- Russ noted the 1/1/08 rules provide for a 20-foot reduction in the setback to a private well with use of a PSND, and other provisions are satisfied.

- PSND is afforded a reduction in the separation to groundwater by one-foot when preceded by advanced treatment, and no such conditional reduction is provided a conventional leachfield.

- It was suggested that the loading rate be increased for the PSND.

- George reminded the group of URIs application for DEM grant support to substantially re write the guidance on BSFs as a guidance providing for all pressurized leachfield options, including those suitable for straight septic tank effluent, and leachfield options to include, chambers, PSNDs and BSFs. This work would consider separation if PSND lines and loading rates and consideration of allowing for increased loading in certain soil types.

George reminded the group that at the time of development of the BSF guide, it was not being considered a treatment device, but as a disposal field option; the genesis of the BSF was acceptance of the impracticality of installing a SNDF in imported soil, due to the inability to match the structure of the native soil beneath. Although it was expected that BSFs would provide some pathogen reduction and it was found that a 1-log reduction fecal in could be expected. Also, although Stolt & Holden found that the A horizon beneath a BSF can remove N and P, It must be considered that in the A horizon, carbon is limited and with advance-treated effluent we are not replenishing it a food source for denitrifiers. A PSND provides for N and P uptake in the grass above it.

There was discussion of the risk of construction in v-zones and A-zone flooding and that the flood issue is not reflected in the GWT. The 1/1/08 rules require the setback be measured from the coastal feature or point from which to measure setback will push systems farther back; v-zone/flooding is not practical consideration to incorporate into design.

Ken asked if there are studies on post-saltwater inundation funtion of leachfields.

Allowing Conventional Leachfields
Concern was expressed for the **lack of biomat development** in a conventional leachfield following an advanced treatment system, and that without the diffusing effect of the biomat most of the effluent will be point-loaded through the first few orifices producing saturated conditions beneath that section of the field and there would be no additional treatment of residuals.

Eljens, as an option – Eljens provide no N removal, although with 5 feet between trenches and 1 foot of sand beneath, the leachfield area (about ½ the area of trenches) would be reduced and there would be some pathogen removal. Russ noted that the **loading rate is high relative to PSND and that there had been concern with mounding beneath Eljens and that is why the spacing is as it is.**

It was **noted and supported that if the PSND performs the best after advanced treatment and provides additional N and P removal, and these are constituents from which we desire to protect the resources, that we should facilitate use of this leachfield option.**

Option suggested: **pressure dose flow diffusors**, which may be the only option for commercial applications, which might have no area available for BSF or PSND options.

Costs were discussed: Nitrogen removal system would be expected to add $10,000 to the cost of a system and that the cost of the PSND or BSF option would add $5,000 to the estimated cost of $12,000 for a typical conventional repair.

The cost of a pump and a 24-inch discharge basin were estimated at $2,500 to 3,000 (includes equipment, installation and electrician).

Location-associated requirement for N-removal (CRA-watershed-wide)
Russ noted that the **decision regarding where to require nitrogen removal was made after substantial consideration of many options and there was no defensible option other than to require the entire watershed (with regard to the CRA requirement)**. He noted also that there is no hardship clause in the rule allowing for relief from the requirement (as there will be from the cesspool removal requirement, when the rules are written to implement the cesspool phase-out statute).

Joe reported that **RIBA sent a letter to DEM concerning the location-based requirement for nitrogen removal in the CRAs**, with consideration that 1 or 2 miles away from the waterbody, there would be plant uptake, millions of gallons of dilution and interception by groundwater, in addition to the removal of nutrients provided by the system. They **propose requiring nitrogen removal for systems with design flows exceeding 2,000 gpd, and on lots less than one acre, so that systems less than 2,000 gpd (design flow) and a lot greater than 1 acre would not be required to denitrify.**

It was noted that even on a large lot a system could still be installed near the pond and that even at a great distance from the pond, as long as the system is in the watershed, we believe the N from each system will reach the pond, although it may not be intuitive that at great distance this is so.

It was reported that regarding the **eutrophication threshold**, a 2 – 3 acre lot may dilute system effluent to 10 mg/l N, however, if this conservative N reaches the pond, this concentration is high for the pond.

Scott Nixon's work showed that a N concentration of < 1 mg/l in water delivered to the "reactive wall", the N concentration downgradient of the wall was 90% lower.

Russ suggested a modification of the 1/1/08 rules' requirement for nitrogen removal in the CRAs as follows:
North of Rt 1, allow use of conventional leachfields, with the nitrogen removal systems.
For repairs, all standards in the rules if 200 feet from the salt pond, or associated wetland most in-land coastal feature and wetland or 150 feet from tributary to pond and tributary or isolated wetland.

Tim suggested that if Rt 1 is the line, require repairs to use PSND South of Rt 1, where there are likely to be high watertables and sandy soil.

George felt strongly that if advanced treatment is to be required, that it makes most sense to require a treatment train that provides the best treatment. This sentiment was supported by Ken.

Alternative to Russ's proposed modification above: North of Rt 1, relief on leachfield for NBC and repair, South of Rt 1, require PSND or BSF for all repairs and NBC.

Quesioned: **Why provide relief would for NBC?**

Russ noted that the greatest concern is with the expense associated with repairs, that historically there has not been resistance to the requirement for advanced treatment for NBC applications. He added that the relief policy for repairs could be considered for watershed-wide application as long as the conventional leachfield could be installed in compliance with all requirements in the rules, with no option for variance application.

George stated that North of Rt 1 is more palatable and that relief should be provided for repairs only; that South of Rt 1 there is less room for error and best available technology should be required.

Tim asked how and alteration with an increase in flow would be handled, Russ responded that it would be treated as NBC, although that if the sentiment of the group were to be to consider these as repairs, that such consideration could be incorporated.

Ken referenced the result of the system performance report for Barnstable County, MA that Deb e-mailed the group, which reports variability in performance, and that with consideration of this, the best available technology/component should be applied when resource protection is considered important enough to require advanced treatment.

Russ noted that the report result is not necessarily negative, with regard to the concentration of N, that with information on the water use of the systems for which data were provided, may indicate low water use and the situation of N loading comparatively low, while N concentration is reported as relatively high – another opportunity for future consideration of loading versus concentration.

Russ suggested that the issue could be revisited in January.

BSF and PSND sizing
The 1/1/08 rules reflect reduction of the wastewater flow numbers for many uses, in acknowledgement that water use is lower due to water saving fixtures than it was previously. It is believed that the size of leachfields is about right, therefore loading rates require adjustment to provide for leachfields being sized the same using the lower flow numbers. This same adjustment is proposed for sizing BSFs and PSNDs. An example of adjusted BSF loading was distributed for review and comment.

George noted that BSFs should not be any smaller. No additional comments.

Policy statement concerning adjustment of loading rates will be developed.

Nitrex Nitrogen Removal Application
The group was reminded that the approval being sought is for a Class II treatment system, and it is being considered a system, because treatment is being performed by unit.

Concerns were expressed about:

- The 3 month start-up, during which time the advanced treatment system responsible for nitrifying prior to the Nitrex Filter receiving the effluent, is not performing at peak efficiency and therefore nor will the Nitrex Filter.
- Media longevity and requirement for replacement; should we require monitoring to verify proper functioning of the Nitrex Filter?

Russ replied that we could consider incorporating into an approval ongoing monitoring for every system.

Other – Nationally Piloted Installer Training Program Underway
George reported on development of national installer training curriculum, providing training on conventional systems and on advanced treatment systems. Tim and Dave Burhnam are official reviewers of the project. The grant provides for four pilot trainings nationwide; the in Las Vegas, Monday and Tuesday of next week at the NOWRA Academy; the next in VA at VAOWWA in April 2008, next at the NOWRA Installer Academy in December 2008 and in Kansas City (DJK recording, did not note which state) in April 2009.

Consideration of Expansion of Class I Design Authority
Russ explained that due to the new requirement for nitrogen removing technology under the 1/1/08 rules, and the increase in system expense in which this results, it has been posed whether the design authority of Cl-I designers could be expanded, in some way, to allow these licensees to submit repair designs incorporating advanced treatment systems. Fro example, could there be a provision for demonstrating system-specific competency by successful installation of some minimum number of the subject system?

Nationally, there is some support for allowing installers to perform some design work, as in some other areas, installers are charged with design of sand filters.

Motion: George made a motion to adjourn the meeting.
Second: Tim seconded the motion.
Vote: All present voted in favor.

The meeting adjourned at 12:25 PM.

Next Meeting
Next meeting was scheduled for January 11, 2008, at **8:30** at the South Kingstown Town Hall at 180 High Street in Wakefield.