Minnesota Pollution Control Agency

Technical Advisory Panel
SSTS Product Registration

Meeting: Thursday, March 15, 2012
10:00 am to 2:30 pm

Minnesota Pollution Control Agency
520 Lafayette Road, St. Paul, Minnesota
Room 2-B

Draft Agenda

10:00 am: Welcome; Introductions; New TAP Members; Review Agenda

10:05 am: December 15, 2011 TAP Meeting Notes – Review and Approve

10:10 am: Product Updates and Renewals – MPCA Website and Documents

10:25 am: New Submittal – Presby Environmental, Inc; Advanced Enviro-Septic – David Presby
- General Introduction of Product Submittal – Barb McCarthy
- Overview of the Product Advanced Enviro-Septic – David Presby
- TAP Questions, Discussion and Recommendations

12:25 pm: Lunch (on your own)

1:15 pm: Operating Permit Issues (follow up previous meeting)
- TAP Discussion and Recommendations

1:45 pm: Basic Designer/Advanced Designer – Type IV (follow up previous meeting)
- Update – Gene Soderbeck
- TAP Questions, Discussion and Recommendations

2:00 pm: Open Forum

Next TAP Meeting – Thursday, May 17, 2012, St. Paul, Room 2-B. Some issues may include: 1) Presby Environmental (continued); 2) Open bottom sand filters; 3) RSF treatment level

Subsurface Sewage Treatment Systems (SSTS)
Technical Advisory Panel (TAP) for Product Registration

Meeting Notes – March 15, 2012

MPCA St. Paul, Room 2-B

Meeting Attendees:

Committee Members	Present on March 15, 2012	Guests	Present on March 15, 2012
Ed Kerzinski	x	David Presby, Presby	x
Mitch Johnson	x	Michael, Carbonneau, Presby	x
Loren Kohnen		Jim Stevenson, RockVale Systems	x
Kemp Ritter	x	Lee Rashkin, Presby	x
Sara Heger	x		
Bob Whitmyer	x		
Greg Halling	x	**MPCA Staff**	
Joe Enfield	x	Barb McCarthy	x
Chad Viland	x	Gretchen Sabel	x
Tom Espersen	x	Mark Wespetal	
Jon Olson	x	Gene Soderbeck	x
Brian Malm	x		
Pete Otterness	x		

The meeting was called to order at 10:00 am by Chair Bob Whitmyer.

Motion by Sara Heger, to approve minutes from December 15, 2011, TAP meeting. Second by Greg Halling. Some corrections were discussed and Barb agreed to amend the minutes to reflect this information. **Minutes were approved.**

Barb updated the committee on several items, including tank registration and the now-completed renewal of Hoot.

Presby Environmental (PEI): Barb provided an overview of the material in the packet for this product. David Presby then presented his product; he is a second-generation septic professional from New Hampshire. He explained how the product works – it provides treatment in the drainfield. The product is an aerobic product but with passive (non-energy using) application that is set into a sand bed. Most in New Hampshire are built with 6" of sand under the pipes, but it can be built with up to 2' of sand for better pathogen removal. (Presby website: http://presbyeco.com/)

Jim Stevenson will be the distributor for Minnesota; he answered some questions. Question – what would it cost to install a system like this? It would be about $3,000 for a 3-bedroom home drainfield

with 6 inches of sand under the pipe. Question – is the topsoil removed? It depends on the porosity of the topsoil; there can be different designs. It is very important that the natural structure of the soil be maintained.

Mr. Presby also demonstrated a sand testing device that can be used to check sand cleanliness and coarseness – the Sand Spec Check. Question – when your systems fail, what is the cause? The failure rate is 0.1 percent, a very small number. The causes of these failures are generally either problems with sand quality or homeowner modification of the vent. When a system fails, PEI will send someone or find a remote way to work with the installer to troubleshoot and fix.

Question – sizing is from E. Jerry Tyler's chart; how does that work out for a system in fine sands – what is the typical length of pipe that is needed? It is based on linear loading rates (LLR); this is based on the Minnesota LLR chart. Question – it's really unclear in this manual how the LLR is actually used. Mike Carbonneau (the technical advisor) answered – this is just an example of how the manual could look; PEI will work with the state to come up with the manual that answers all the questions. There would be two loading rates; one would be a per-bedroom sizing rate for pipe and the other would be a soil loading rate for the sand bed.

Question – how long does it take for water to begin to pond in the pipe. Answer – it depends. In the Bureau De Normalisation Du Quebec (BNQ) testing, it took 18 days for the systems to start to meet standards. Follow up – I asked this question because of the state's requirement for pressure distribution. Answer – the AES product is different, pressurization is not needed here to ensure treatment. Question – why is the high stack 10' tall? Did you do testing to determine this? Yes, there was testing in California. They looked at the amount of greenhouse gases. There needs to be at least a 10' differential between the high vent and the low vent. Question – did you do any atmospheric testing inside the pipe? Answer – he uses a bee smoker to puff smoke at the vent to verify that it is venting.

Jim Stevenson explained further that two calculations need to be made; one to size the vent and one to size the hydraulic loading rate. For commercial, this is a lot less standard. Comment – the manual needs to also address the required state well code setbacks.

Comment – distribution needs to be uniform over the treatment area. This would seem to be a problem for this product. Response – the sand will act as a sponge to uniformly distribute the effluent across the sand bed. There were a couple of simultaneous conversations on this topic for a bit. Question from Mike Carbonneau – based on Table IX in the rule, what is the best way to express and display the loading rate information? Based on BNQ testing, sizing is at 2.58 gallons per lineal foot.

Overall, there are a number of items where the product does not fit closely with the rule; for example the maximum linear loading rates for mounds is 12, how would you address this? Carbonneau has been doing system designs using Presby Environmental in Minnesota designs, he is confident that this can be worked out.

There was a discussion about how the system can fit into the rule. Mr. Presby stated that the rule may need to be changed or the state may have to forego using this product. He stated that Washington State's rules are so restrictive they cannot get in. Chair Whitmyer stated that this will be discussed again at a subsequent meeting. Committee members should email their questions to Barb and she will forward them to Mike Carbonneau. Questions will be due to Barb by March 22, 2012 and she will copy the committee on what she sends to Mike Carbonneau. There was discussion of time dosing, this seems like it could be the sticking point. The TAP thanked the Presby Environmental representatives for the presentation.

After lunch, the group discussed problems with operating permits, using the attached table as the discussion guide (see). Members were requested to think more about this and bring their sheet back to the next meeting.

Gene Soderbeck discussed the AD/AI Minus (new classification). More staff has been added to this area, half of Mark Wespetal's time will be spent here and another position is being established to assist in the licensing program. Scope would be set at less than 2500 gpd, single family with no collection. Question – will there be a transition period allowed? Not at this time. There are concerns that there is not a decision on what would be required so it would be difficult to determine what would be an acceptable transition level. He also said that the Master Contract, for greater than 2500 g/d, that was discussed at the previous meeting is still moving ahead. Sara urged TAP members to consider volunteering to serve on either the Steering Team or the Sounding Board to help develop the limited AD/AI.

Barb McCarthy reported that Infiltrator has still not finalized the memo on sand intrusion that was to be sent to all Minnesota LGUs. They have been reminded a couple of times; it needs to be done.

Next steps on Presby – there are three big issues that need to be resolved; these should be resolved before the TAP takes a more detailed look at the product**. Motion Johnson, second Enfield, that Presby be asked to address how their system would be sized in Minnesota including contour loading rate and maximum bed width and how they will meet requirements for uniform distribution and time dosing. Passed unanimously.** Barb will draft questions relating to time dosing and uniform distribution and she will send these to TAP members. Comments will go back to Barb to make sure the questions address our concerns. Barb will then forward the questions to Presby by the end of this month.

Motion to adjourn the meeting was made by consensus. Meeting adjourned at 2:15pm. Next meeting is scheduled for May 17, 201 2, if needed. The next scheduled meeting after that is July 19, 2012.

DRAFT AGENDA

Technical Advisory Panel
SSTS Product Registration

Meeting: Thursday, July 19, 2012
10:00 am to 3:30 pm

Minnesota Pollution Control Agency
520 Lafayette Road, St. Paul, Minnesota
Room 2-B

Draft Agenda

10:00 am: Welcome; Introductions; Review Agenda

10:05 am: March15, 2012 TAP Meeting Notes – Review and Approve

10:10 am: Product Renewals, MPCA Website and Documents

10:15 am: New Submittal – Knight Treatment Systems (Informational)
- General Introduction of Product Submittal – Barb McCarthy
- Overview of Product – Mark Noga/Douglas Nelson
- TAP Questions, Discussion and Recommendations

11:45 pm: Lunch

12:30 pm New Submittal – Micro Bubble Diffusion (High Strength Waste)
- General Introduction of Product Submittal – Barb McCarthy
- Overview of the Product – Roger Vorhies/ Eric Larson
- TAP Questions, Discussion and Recommendations

1:45 pm New Submittal – BioMicrobics for NitriFast (Nitrogen Removal)
- General Introduction of Product Submittal – Barb McCarthy
- Overview of the Product – Allison Blodig
- TAP Questions, Discussion and Recommendations

3:00 pm: Update – Basic Designer/Advanced Designer, Type IV and <2,500 gpd
- Update – Mark Wespetal/Gene Soderbeck
- TAP Questions, Discussion and Recommendations

3:15 pm: Open Forum

Next TAP Meeting – Thursday, September 20, 2012, St. Paul in Room 2-A.

Minnesota Pollution Control Agency

Subsurface Sewage Treatment Systems (SSTS)
Technical Advisory Panel (TAP) for Product Registration

Meeting Notes – July 19, 2012

MPCA St. Paul, Training Room 2

Meeting Attendees:

Committee Members	Present on July 19, 2012	Guests	Present on July 19, 2012
Ed Kerzinski	x	Mark Noga, White Knight	x
Mitch Johnson	x	Doug Nelson, White Knight	x
Loren Kohnen	x	Allison Blodig, BioMicrobics	x
Kemp Ritter		Tony Birrittieri, Peterson Supply	x
Sara Heger	x	Eric Larson, Septic-Check	x
Bob Whitmyer	x	John Jacobs, Schaus-Vorhies	x
Greg Halling	x	Roger Vorhies, Schaus-Vorhies	x
Joe Enfield	x	**MPCA Staff**	
Chad Viland		Barb McCarthy	x
Tom Espersen	x	Gretchen Sabel	x
Jon Olson	x	Mark Wespetal	
Brian Malm		Gene Soderbeck	x
Pete Otterness	x	Corey Hower	x

The meeting was called to order at 10:00 am by Chair Bob Whitmyer.

Motion by Sara Heger, to approve minutes from March 15, 2011, TAP meeting. Second by Greg Halling. Minutes were approved.

Product Renewal – Barb stated that there are 14 products up for renewal this year. She provided the list in the packet; she is hopeful of getting more feedback than she did last year, now that the requirement to use registered products is in place and more have been used. Sara noted that there are many systems that don't have data; would the committee support the University if they were to develop a proposal to do some testing as an audit? Data will be submitted as well from the systems that are being monitored. There was general support from the committee.

White Knight – Barb introduced this product; this is the introductory meeting. They have submitted a request for registration of both residential and high strength treatment. Mark Noga and Doug Nelson shared information about the company and product. The primary key to this treatment system are the aerobic microorganisms; this set of bacteria are carefully selected to improve waste treatment, very similar to an activated sludge process in a wastewater treatment plant. The bacteria mix is patented. The device is installed into the septic tank; it can be installed at any time of year with little disruption in the yard. Installers are trained to interview the homeowner and inspect the water using fixtures in the house to make sure that good practices are in place before the device is installed.

The device features an airlift pump to aerate the effluent and a bacterial injector that feeds aerobic bacteria into the device for treatment. Doug showed a graph from State of Massachusetts showing that ponding is eliminated when the device is in place. This device differs from similar devices in that it seeks to build bacteria populations in the effluent heading out into the drainfield. Question: does the device create laminar or turbulent flow? It is turbulent. What is the velocity on the airlift? It is relatively small, 25 gallons per minute. Question: what happens if there is not an effluent filter following the device? A lot of suspended solids will enter the trenches.

Mark discussed the use of this product in commercial and high strength situations, citing testing done in the Syracuse area. He showed the example of the Glen Haven restaurant. Testing here was conducted by the City of Syracuse with a consulting firm collecting the samples, so Mark felt that this is third-party testing. He also gave the example of a small community, City of Rushville, where White Knights were used to aerate and inoculate the effluent.

The device has been through the ETV process; the ETV report is included in the meeting packet. The units are currently being tested at MASSTC, where they were used to remediate a clogged sand filter. This product cannot be tested to NSF 40 because it has 'beneficial microorganism inoculation ongoing'; there is a new standard being discussed that would test this system. Work on this has slowed because of the economy.

Question: Why is the inoculation only yearly? It's not, when a system is new the bacteria packet is replaced monthly until the ponding is cleared, and then it goes to annual. Question: Has the use of just the aeration unit without bacteria been tested? There has been some testing; but the company feels that the bacteria are very important to the process. Mark noted that the bacteria that are used were isolated from leaf litter and are specialized at breaking down cellulose and other complex molecules; they are not part of the 'native' population of a residential system. Question: what retention time is recommended? About 1.5 times daily flow. However, if detention time is longer the bacteria packet includes enough 'food' for the bacteria in the form of cellulose that they can sustain their populations in that interval.

Mark noted that this system has been approved for use in Wisconsin. Question: How long can a normal aerobic system last when people travel and are gone for an extended period of time? The company recommends that maintenance be performed (re-inoculation) when use is resumed after a period of disuse. Maintenance interval on the tank (pumping) is about every three years, sludge grows more slowly. The technician returns to the site every six months when a service contract is in place to make sure everything is working well; they check the bacteria packet and look at the bubble pattern in the tank, any biofilm that is showing, etc. The product is only sold through trained and certified dealers. Maintenance frequency for commercial systems is designed based on system challenges and performance.

Question: Does the White Knight have a pounds-of-BOD rating? Yes, this is in the packet, in Appendix A to the Design and Operation Manual. Comment: Without bacterial reduction data, it would be hard to

approve any reduction. Minnesota's rules are clear on testing requirements; the data that has been submitted does not meet this standard. Barb shared the interim conditional product registration for high strength waste process; she noted that MPCA engineers would review the data that's submitted. Once a product has this registration, the company's engineer would work with the Advanced Designer to make sure that each use is appropriate. Barb noted that MPCA also registers products used for remediation purposes; once the work at the MSSTC is complete, this data will be reviewed. Mark replied that it will be 18 months at least before any reports are used; would MPCA be willing to look at an interim report? MPCA will get back to White Knight on this. Barb stated that this could readily be used as a Type 5 system, with engineer involvement. Comment: TAP needs to be consistent with how other products were registered for remediation. If White Knight came in with other third party testing (not NSF, but independent none the less), would the same standard be met? Barb said that based on the available information that's been collected to date at MSSTC and the other data submitted we may be able to look at this for remediation, registered at Treatment Level C. If this data is sent in, the TAP will review it and discuss it at the September 2012 meeting.

MicroBubble Diffusion – After lunch, Barb introduced the MicroBubble Diffusion product. A demonstration installation will take place tomorrow at the MOWA Summer Seminar in Milaca, as a Type 5 system. Roger Vorhies and John Jacobs were on hand to present this product, which was developed by the inventor of the VBT. John stated that the fineness of the oxygen bubbles in this product allows the oxygen to actually get between the water molecules, increasing the level of oxygenation and the time that oxygen stays in the water. These bubbles are about 4000 times smaller than forced air bubbles, meaning there is very much more surface area available. Surface tension of the water keeps the bubbles in the water. The oxygen transfer efficiency is 80%. This product is very similar to those used for aerating sewage and manure lagoons; Mr. Jacobs showed many slides depicting their use in this way. He then showed a video; it can be viewed at: www.wtrsolutions.com .

Question: We have already registered the VBT, how is this different? The diffuser orifice disc has been changed to reduce plugging, and the motors have been improved to increase reliability and durability. Eric Larson discussed his experience with VBT and his understanding of the quality of treatment they offer. There were significant concerns with durability though; the failure rate was 20% by the second year. Once he learned that the durability issues were corrected in the MicroBubble Diffusion product, he was interested in seeing this product registered for use in Minnesota. With this product, the maintenance contract includes replacing the bearings in the pump after two years of use. This will really increase the durability, too.

Question: in the past, there were problems with fine bubble diffusion ports plugging where the pH changed due to oxygenation of the water. Has this been addressed? Yes, the new diffuser plates address this. Question: have you ever thought of cycling the device on and off? This would increase life? Yes, this is being done also for denitrification. Question: is there any data on how this product performs in septic systems? It is being collected; while use of this product has primarily been on larger wastewater projects, the technology applies to smaller systems like SSTS as well. John passed around the new and improved diffuser plates for people to examine. Bob noted that this product is requested for Interim Conditional Product Registration for High Strength Wastes; Barb stated that the lack of data

from actual septic systems makes it hard for Minnesota to do this. She suggested that this product could continue to be used in Type 5 systems until more data is available. Comment: would it be possible to include this in the VBT registration? No, they are significantly different in technology and are under separate patents, and completely different companies. Long discussion. Gene urged the group to think about different reaction coefficients, and whether there is any point to registering a product for high strength waste when wastewater differs so much. Bob noted that, looking at the larger picture, although things are similar, they are different enough that we need more data on the device as it is used in smaller systems. No motions were made. Eric argued that the application does not require specific septic information; this was disputed. The committee felt that the same process should apply to all; they thanked the manufacturer for their time and told them that it will be good to see the data when it becomes available. Installing it in Type 5 applications will be very illuminating.

Bio-Microbics NitroFAST – Allison Blodig and Tony Birrittieri talked about these products. Bio-Microbics has a treatment train that will achieve a Nitrogen level of 10 mg/l or less; they are seeking to have this train listed as a <10 N system. The data that was presented was discussed; it was deemed to be third-party data because they contract with an independent party to take the samples and then send them to a certified lab. **Motion Heger, second Otterness, to update BioMicrobic's MicroFAST registration to show the actually NSF-tested value of 16 mg/L; this product was registered at <20 because it was registered before the 2011 rule change**. Sara made this motion because the third-party data does not show that the system achieves less than 10. **Motion passed unanimous.** Bio-Microbics representatives stated that they will compile data from operating systems that has been obtained through third-party testing and show that the treatment train does indeed achieve less than 10 mg/L.

MPCA has some data from the use of these systems that has shown some problems; this raised questions. Barb distributed a copy of this data for the committee's review. Question: How does temperature play into this? Allison stated that the systems are designed based on 20^{o}C water; and most of these systems are at this temperature. Tony raised concerns about the value of the MPCA data that was presented; when it is taken out of context it is difficult to draw conclusions. Many of these systems are at housing developments that never reached full build-out; even when the total number of dwellings is met the actual flows are way below design flow. Question: Some are working (meeting discharge limits) and some aren't – what's the difference? Tony stated that some were designed better, some are operated better, and some have better users. He then discussed specifics with some of the systems for which data was included. He talked about efforts that are being made to correct the problems and ensure that these systems can meet standards. Question: How much maintenance do these systems require? More than the owners were prepared for; it depends on the quality of the operators. Relative to process control, the company uses telemetry daily to verify that the system is still working well. Weekly, the operator visits the site and uses test strips to check performance. Official samples are collected monthly; this is when the majority of any needed maintenance occurs. Actually, the largest amount of work on these systems is generally mowing grass, weed whacking, etc.

Question: How do we get these systems operationally to meet 10 Nitrogen? Comment: How do we know that smaller systems that were installed with registered products are meeting standards? Discussion on wastewater operator certification and its value. Gene stated that MPCA has been

struggling over whether to make changes in this area. One suggestion that was made was that MPCA should single out bad operators and pull their license. Tony said that it is not appropriate to base approval of a product on performance in the field because there are so many variables that go into achieving compliance; a poor operator or an owner who won't pay for changes will bring a system down. The need for additional monitoring of all systems that are required to meet 10 TN was discussed. Bio-Microbics staff and Peterson Supply staff agreed to meet with MPCA staff to discuss the reasons for noncompliance at the MPCA-permitted sites.

AD/AI Midlevel New Classification – Gene Soderbeck recounted briefly the work that's been done on the new licensing category. Greg Halling suggested that the new classification be referred to as the Advanced Residential Designer and Advanced Residential Inspector. Question: Will the Mid-level Inspector have to go to Service Provider class? More input is welcome on this question.

Motion to adjourn the meeting was made by consensus. Meeting adjourned at 3:50 pm. Next meeting is scheduled for September 20, 2012.

DRAFT AGENDA

Technical Advisory Panel
SSTS Product Registration

Meeting: Thursday, December 20, 2012
10:00 am to 2:30 pm

Minnesota Pollution Control Agency
520 Lafayette Road, St. Paul, Minnesota
Room 2-A

Draft Agenda

10:00 am: Welcome; Introductions; Review Agenda

10:05 am: July 19, 2012 TAP Meeting Notes – Review and Approve

10:10 am: Product Renewals – Feedback, Discussion and Recommendations

10:20 am: New Submittal – Orenco Systems (AXRT Series with UV Disinfection)
- General Introduction of Product Submittal – Barb McCarthy
- Overview of Product; Comparison UV Test Data – Nicholas Nobles & Joe Soulia (by phone)
- TAP Questions, Discussion and Recommendations

11:15 am: Micro Bubble Diffusion (High Strength Waste) – Update with 2012 Test Data
- General Introduction of Product Submittal – Barb McCarthy
- Overview of 2012 Test Data – Eric Larson
- TAP Questions, Discussion and Recommendations

12:00 pm: Lunch

1:00 pm: Knight Treatment Systems – Update with 2012 Test Data
- General Introduction of Product Submittal – Barb McCarthy
- Overview of 2012 Test Data – Mark Noga/Douglas Nelson (by phone)
- TAP Questions, Discussion and Recommendations

1:45 pm: Open Forum

Next TAP Meeting – Thursday, February 21, 2013, St. Paul in Room 2-A.

Minnesota Pollution Control Agency