

Technical Advisory Panel SSTS Product Registration

Meeting: Thursday, March 17, 2011
10:00 am to 3:00 pm

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

Draft Agenda

- 10:00 am: Welcome; Introductions; New Member - Jon Olson; Review Agenda
- 10:10 am: November 18, 2010 TAP Meeting Notes – Review and Approve
- 10:15 am: Product Update - Sewage Tanks, Letters to Manufacturers (Levels A2 and B2), MPCA Website, Lists, Update on NSF progress in a testing protocol for High Strength Wastewater
- 10:30 am: Infiltrator Systems (New application for Quick4 Plus High Capacity chamber)
- Overview of submittal and documents – Barb McCarthy
 - Overview by company representative – Ben Berteau and/or Jeff Iverson
 - TAP Questions, Discussion and Recommendations
- 11:15 am: Advanced Drainage Systems (New application for Arc 36 Low Profile [LP] Chamber)
- Overview of submittal and documents – Barb McCarthy
 - Overview by company representative – Dick Bachelder
 - TAP Questions, Discussion and Recommendations
- Noon: Lunch
- 12:45 am: Draft Remediation Document
- Overview of comments – Barb McCarthy
 - TAP Questions, Discussion and Recommendations
- 1:30 pm: Alternative Testing Protocol Framework – Continuation from October 21, 2010 Meeting
- 1:45 pm: Draft Bottom Draining Sand Filter Document
- Overview of content and review comments – Barb McCarthy
 - TAP Questions, Discussion and Recommendations
- 2:30 pm: Open Forum
- 3:00 pm: Adjournment

Next TAP Meeting – Thursday, May 19, 2011, St. Paul, Room 2A.



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

Meeting Notes –March 17, 2011

MPCA St. Paul, Room 2-A

Meeting Attendees

Committee Members	Present on March 17, 2011	Guests	Present on March 17, 2011
Ed Kerzinski	x	Ben Berteau (phone)	x
Mitch Johnson	x	Dick Bachelder (phone)	x
Loren Kohnen			
Kemp Ritter			
Sara Heger	x	MPCA Staff	
Bob Whitmyer	x	Barb McCarthy	x
Greg Halling	x	Gretchen Sabel	x
Joe Enfield		Mark Wespetal	x
Chad Viland	x		
Sean Riley	x		
Tom Espersen	x		
Jon Olson	x		

The meeting was called to order at 10:05 am by Chair Bob Whitmyer. The agenda was reviewed; an amended agenda was approved with the addition of the discussion of BioDiffuser Chambers.

Motion by Sara Heger, to approve minutes from November 18, 2010, TAP meeting. Second by Ed Kerzinski. Bob Whitmyer identified two typos which were noted and will be corrected. The committee voted to approve the minutes as amended with no “no” votes.

Update on Products and Tank Registration

Barb McCarthy updated the group on recent changes, reviewing information recently added to the MPCA’s Product Registration webpage. Barb passed around copies of 11 new letters to manufacturers that were recently sent to them to reflect the recent rule change that added two new treatment levels.

Update on NSF Testing for High Strength Waste

Sara Heger provided information on the project she’s working on to develop a generic high-strength wastewater for testing purposes. The next challenge for this project will be to develop the feed wastewater at a scale that would be usable for field testing and also some questions such as temperature have to be addressed. There are a lot more issues to resolve, and the timeframe for NSF to move forward on this is potentially long and uncertain. Barb McCarthy stated that the process we are using in Minnesota for HSW testing for interim registration will not be affected by the work being done at the National Sanitation Foundation (NSF).

Sewage Tank Registration

Barb McCarthy reviewed the draft listing she prepared of tanks associated with registered treatment products and her initial analysis of which ones would need to use registered tanks versus those products for which the tank is an integral part of the system. Comment: so basically, if the tank is an integral part of the treatment product, then the tank is covered in the product testing and so additional registration. Question: Does this apply to existing systems? No, it's only for new installations. Barb restated the committee's concerns: in general, they have concerns that people installing a treatment product that fits into the existing tank should be required to employ a registered tank. Chair Whitmyer suggested a process where tankage would also be approved; Mark Wespetal suggested that a question be added to the registered products application that asks who designs their tanks and whether they are a Professional Engineer.

Infiltrator Systems

Ben Berteau was called and attended this portion of the meeting by telephone. Barb McCarthy reviewed the application that Ben had submitted for the Quick4 Plus High Capacity Chamber. Ben Berteau stated that the average louvered height of the sidewall is indeed 12 inch and this is shown on page 6 of the Design Manual that was submitted. This model of the Quick4 Chamber was designed with Minnesota in mind – it was designed to meet a 12 inch average louvered height. Comment: the dimension is not shown on the manual. Barb McCarthy noted that the dimensions are shown in an attachment in a different location and will be reflected in the listing letter. Ben Berteau noted that the redesign also includes a 46 percent increase in open area of the sidewalls.

Question: Why did Infiltrator decide to incorporate a center post? They did it to augment the design; the center post increases the bearing strength. They have not reduced the area that the product covers; they have shifted it from the sides of the product to this new center post. Question: Does Infiltrator have guidance as to whether the orifices should face up or down? This is covered in the Design Manual on pages 30 and 31. Drain back is not addressed in the manual now, this should be added. This is not unique to this product; it is true for all the Infiltrator products. Long discussion; Ben Berteau will address. Barb McCarthy also asked to change wording in the manual from "chambers approved" to "chambers registered" in the Introduction of the Design Manual.

Ben Berteau then addressed a study that was done to look at the distribution of water based on the orientation of the holes relative to the center post. This study was reviewed. Question – of the wetted area, do you know how uniformly it was distributed? No, this was not a factor that was considered, only the extent of the wetted surface. Barb McCarthy showed how the product would be listed on the "At A Glance" list; this shows that the product could be used with a maximum of a 20% reduction in trenches due to meeting the 12 inch sidewall requirement.

Motion to approve listing this new model of the Quick4 chambers as registered in Minnesota was made by Greg Halling, second by Chad Viland. Approved unanimously. Sara Heger noted that Infiltrator has developed a couple of videos that show installation of both the Quick4 chambers and the EZflow product in mounds. Ben Berteau indicated that he would figure out a way to link this to the

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manual so folks know it's out there. Barb McCarthy noted that Infiltrator has also requested Warrantied status; a letter was written to Infiltrator with additional questions related to this request. There was no discussion on this request by the committee.

Advanced Drainage Systems (ADS) Arc 36 Low Profile (LP) Chamber

Dick Bachelder was called and participated in this part of the meeting by telephone. Barb McCarthy reviewed the documents that ADS submitted and some additional information including a recent Menard's advertisement that showed the ADS BioDiffuser chambers. Dick Bachelder stated that the products sold at Menard's are an older product that is warranted in Minnesota; Dick indicated that the registered products are only available to contractors. Question: Are the distribution pipes to be hung in the ADS chambers? An ADS chamber can be used in either way (hung or laid on the infiltrative surface), or the Simtech supports can be used that elevate the pipe off the ground.

Comment: We don't give reductions for pressure versus gravity; this means that Dick's position is correct. To have breakout on a system, they would have to have full biomat before ponding would occur. It is not appropriate to have sizing differences based on this. **Motion by Heger, second by Esperson, that the Arc 36 LP Chambers be registered in Minnesota. Passed unanimously.**

Advance Drainage Systems (ADS) BioDiffuser Chambers (11" Standard and 16" High Capacity)

This is a septic system product that was advertised in a Menard's advertisement in February 2011. The 11" Standard BioDiffuser was warranted in August 2002; now ADS is submitting a request to also have the product registered, along with the 16" High Capacity BioFiffuser Chamber. As previously noted this is an older design and are meant specifically for the homeowner market through retailers like Menards, Home Depot, and Lowes. The advertisement prompted a call to the manufacturer on February 28, 2010, and so the submittal information has not been reviewed; there are still some information pieces that are needed. **Motion by Espersen, second by Johnston to delay this product registration and bring it back to the TAP at the May 19, 2011 meeting. Passed unanimous.** Barb McCarthy will outline the needed information to Dick Bachelder. The timing of this approval will be lengthened; Dick Bachelder will submit additional information for the May 19th TAP meeting.

Draft Remediation Document

Barb McCarthy reviewed the comments received on this document during the review period. A marked-up version was provided in the meeting packet. Question: is it clear to people whether adding a treatment product to an existing system makes it Type IV? Can only use registered products unless they bring in an engineer? Discussion – this question is somewhat covered at the bottom of page 1; several on the panel felt it needs to be clearer. Barb McCarthy will add another sentence here to say that use of non-registered products would result in the system being a Type V. Comment: The local role in regulation needs to be clear here – there is a lot of latitude for LGUs in determining how to handle this issue. **Motion by Heger to approve this document, second by Halling. Passed unanimously.**

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Alternative Testing Procedure

This item is a follow-up to the October 2010 meeting where Multi-flow requested to be re-registered as a Treatment Level B based on field testing. Barb McCarthy distributed a document that outlines the position that MPCA has taken; that MPCA will not come up with a testing protocol independent of NSF. NSF has developed a new standard 360 that is a field-testing protocol; Barb will email this to the panel members.

Draft Bottom Draining Sand Filter Document

This is a topic that Barb McCarthy and other TAP members have been working on as time allowed over the past year. A draft guidance document has been developed and was reviewed by the committee. There is a limit on size based on environmental concerns (ground water). Question: shouldn't this be limited to only systems with pretreatment – that way you ensure treatment is occurring? Mark Wespetal has an ASAE paper on 'box mounds'.

There was long discussion on items in the draft document. Question – why do we allow 10 ft in a mound bed width but a width of 25 ft width in a sand filter? The concern is for the possible formation of an anoxic zone in the middle of the bed. We should consult with researchers at the University of North Carolina regarding appropriate K_{sat} for a bottom draining filters. Long discussion ensued. Barb McCarthy took notes to update the document. The loading rates should be based on the new Table 9 in 7080, with some slight modifications.

The amount of saturation in the filter media was discussed, and the ease with which water would flow from the filter into the underlying soil. Question: What about the pea rock underdrain? Orenco says that the purpose of the pea rock was to prevent the filter sand from moving into the underlying soil. An advantage of having the pea rock is that you can add pipes and air into the bottom of the system to promote greater aerobicity. The movement of air within the filter was discussed. Comment: A 4 inch inspection slotted pipe should be added into the filter so it can be pumped if something goes wrong.

The draft document will be revised for the May 19th TAP Meeting for continued discussion. Ed Kerzinski (text) and Mitch Johnson (drawings) will assist in the revision effort.

Upcoming Meetings

The upcoming NOWRA/NEHA/SORA meeting will be held on June 19-21, 2011 in Columbus, Ohio. There will be a number of good technical talks that folks should consider attending.

The next TAP meeting will be held on May 19, 2011, beginning at 10:00 at the MPCA, Room 2A. Topics will include 1) ADS BioDiffuser submittal and any other products that ADS may seek to register, 2) revised Bottom Draining Sand Filter Document (and changes to the bigger sand filter document), and 3) product renewal.

Motion was made to adjourn the meeting was made by consensus. Meeting adjourned at 2:55.

Technical Advisory Panel SSTS Product Registration

Meeting: Thursday, May 19, 2011
10:00 am to 1:00 pm

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

Draft Agenda

- 10:00 am: Welcome; Introductions; Review Agenda
- 10:10 am: March 17, 2011 TAP Meeting Notes – Review and Approve
- 10:15 am: Product Update - MPCA Website, Lists and Documents
- 10:30 am: Advanced Drainage Systems (continuation from March 17, 2011 meeting)
- Overview of submittal – Barb McCarthy
 - Overview of Manual (Arc & BioDiffuser chambers) – Dick Bachelder, by phone
 - Overview of draft ADS letter and listing – Barb McCarthy
 - TAP Questions, Discussion and Recommendations
- 11:15 am: Update on Bottom Draining Sand Filter Document (and distribution of ASAE paper on box mounds)
- Overview of content and review comments – Barb McCarthy
 - TAP Questions, Discussion and Recommendations
- 11:45 pm: NSF Standard 360 (Field Performance Verification; November 2010)
- Informational item
- 11:55 pm: Product Renewal Process
- Affidavit form – Barb McCarthy
 - Feedback from LGU and practitioners
 - TAP Discussion and Recommendations
- 12:00 pm: Tire Chips
- General discussion on topic (Small Flows, 2003)
 - TAP Recommendations
- 12:30 pm: Open Forum
- 1:00 pm: Adjournment

Next TAP Meeting – Thursday, July 21, 2011, St. Paul, Room 2A. Potential agenda items:
1) Amphidrome SBR; 2) Product Renewal; 3) Sand filter (bottom draining)



Minnesota Pollution Control Agency

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

Meeting Notes –May 19, 2011

MPCA St. Paul, Room 2-A

Meeting Attendees

Committee Members	Present on May 19, 2011	Guests	Present on May 19, 2011
Ed Kerzinski	x	Dick Bachelder (phone)	x
Mitch Johnson			
Loren Kohnen	x		
Kemp Ritter	x		
Sara Heger	x	MPCA Staff	
Bob Whitmyer	x	Barb McCarthy	x
Greg Halling	x	Gretchen Sabel	x
Joe Enfield	x	Gene Soderbeck	x
Chad Viland			
Sean Riley	x		
Tom Espersen	x		
Jon Olson	x		

The meeting was called to order at 10:05 am by Chair Bob Whitmyer.

Motion by Ed Kerzinski, to approve minutes from March 17, 2011, TAP meeting. Second by Sean Riley. Gretchen Sabel identified a typo which was noted and will be corrected. The committee voted to approve the minutes as amended with no “no” votes.

Update on Products and Tank Registration

Barb McCarthy reviewed the remaining meeting dates for 2011; these dates are: July 21, 2011; September 15, 2011; November 17, 2011; and December 15, 2011. Barb noted that there are two new applications that have come in; it is likely that the July meeting may require the full 5 hours (10:00-3:00). Barb reviewed the website changes and updates. Sara Heger raised a concern about how the links to the manufacturer’s websites are working. In several cases, the link goes to the company’s main page and then the practitioner has to spend time searching for it; in one case there is no information. Barb said she would look into this.

Advanced Drainage Systems (continuation from March 17, 2011 meeting)

Dick Bachelder from ADS was connected to this meeting by phone for this part of the meeting. Barb McCarthy distributed a copy of the ADS product manual that Dick has sent out Wednesday afternoon; Dick noted that there were several additional changes that he highlighted in his comments. This is the same manual that was included in the ARC product registration except that the older products that were formerly sold as Warrantied (11” standard BioDiffuser and 16” High Capacity BioDiffuser) were added.

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Question: Chair Whitmyer asked whether the inside diameters shown are averages, Dick confirmed this.
Question: Sara asked what the company means when they use the word “compacted” on page 13 – does this mean stepping in or is using a compactor needed? Long discussion – several members raised concerns that too much compaction would result in system problems. It was decided that the bullet point on page 13 that refers to compaction be removed.

Dick directed the TAP to review the language on page 16; there is a typo here that will be fixed. Chair Whitmyer asked about the design of At-grades using ADS chambers – is it necessary to limit this to sites with less than 1 percent slope? Dick answered that he required a flat site because he has concerns about the use of any chambers (not just ADS chambers) on a sloping site; now he is considering different approaches that may allow use of chambers with greater concern for system longevity. Long discussion; several members agreed with Dick’s concerns but there was a general feeling that the designer and installer can work this out adequately. Dick stated that he will drop this provision from the ADS manual. Barb noted that the ARC chambers were listed with the 1 percent slope restriction.

Question: Does ADS require filter fabric when the system is under pressure? Answer: No. Then what does the next-to-last bullet on page 20 mean? Dick agreed to add the words “may be” before “covered” in the next-to-last bullet, and to add information to the at-grade design shown on page 22. Question: does ADS allow an installer to lay the pipe at the bottom of the at-grade, or do they have to use zip-ties and hang the pipe? ADS views this as up to the Designer; either one works.

Motion Heger, second Halling, in order for product consistency, the previous approval letter for ADS products should be amended to remove the slope restriction on at-grades. Passed unanimous. Other changes to the registration letters were discussed; Barb will go through the modified manual that Dick will send and update the letters as needed. Barb will also update the listings to include these newer products. Before the final letter is developed, Barb will share the updated manual with members so they can make sure everything is as discussed.

Update on Bottom Draining Sand Filter Document (and distribution of ASAE paper on box mounds)
This document was reviewed and needed revisions discussed. One topic of concern was the applicability of this design on particular sites. Comment: why would this design be limited to 2500 gpd or less, when an Advanced Designer can design a soil treatment component up to 10,000 gpd? This should be changed – if the system is one that needs a Board-licensed Professional for groundwater reasons, the AD can still design the soil treatment component. Comment: it says in here that box mounds are essentially the same as single-pass sand filters; Sara Heger did not agree with that. That statement was taken from the paper by Mark Wespetal which was distributed to the TAP in the mailing – it will be modified in this document. Long discussion on the diagrams and what changes are needed. Ed Kerzinski and Barb McCarthy were recognized for their continuing work on this project.

NSF Standard 360 (Field Performance Verification): The final version of this standard came out in November 2010. Products seeking to use this protocol will need to go through NSF 40 first and then verify that what they discovered in that testing to be field verified using some process. Chair Whitmyer

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noted that this document did not address flow; the group agreed that this is a critical parameter to understand system performance; Barb will talk to them and see what they say about it.

Product Renewal Process

Barb discussed the Affidavit Form that was distributed in the TAP mailing, as well as her concepts for getting feedback from LGUs. She is planning to conduct an LGU survey relative to the seven products that will be due up for renewal at the end of 2011. Suggestion: contact manufacturers to see if they can provide a list of registered products that have been installed since product registration began. Barb agreed to do this. Question: will the survey be electronic? Yes.

Tire Chips: Barb reported someone from the MPCA solid waste program contacted her – he is putting together a list of beneficial uses for tire chips; he asked whether using tire chips. Barb found the paper that dealt with this and provided it to the TAP. Comment: Sara commented that there probably is a shortage of tire chips in Minnesota because we already have a good program for beneficial reuse of tires.

Open Forum: No open forum topics were raised.

Upcoming Meetings

The upcoming NOWRA/NEHA/SORA meeting will be held on June 19-21, 2011 in Columbus, Ohio. There will be a number of good technical talks that folks should consider attending. Mark Wespel is attending for MPCA; Sara Heger will be there.

The next TAP meeting will be held on July 21, 2011, beginning at 10:00 at the MPCA, Room 2A. Topics will include: 1) Amphidrome SBR; 2) Singulaire Green; 3) revised Bottom Draining Sand Filter Document (and changes to the bigger sand filter document), and 4) product renewal.

Motion was made to adjourn the meeting was made by consensus. Meeting adjourned at 12:45.

**Technical Advisory Panel
SSTS Product Registration**

Meeting: Thursday, September 15, 2011
10:00 am to 3:30 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: May 19, 2011 TAP Meeting Notes – Review and Approve
- 10:15 am: Product Update - MPCA Website and Documents; Proposed 2012 Meeting Dates
- 10:30 am: Norweco – Singulair Treatment Systems (960 and TNT Model Series)
- Overview of submittal – Barb McCarthy
 - Overview of product – Don Bach, Sales Manager and Mike Benton, RS
 - Overview of draft letter, listing, other items – Barb McCarthy
 - TAP Questions, Discussion and Recommendations
- 12:00 pm: Lunch
- 1:00 pm: F.R. Mahoney – Amphidrome Wastewater Treatment System (initial meeting)
- Overview of submittal – Barb McCarthy
 - Overview of product – Philip Pedros, PhD, PE
 - TAP Questions, Discussion and Recommendations
- 2:30 pm: Product Renewal Process
- Feedback from LGUs and practitioners (7 treatment products up for renewal)
 - New webpage – application for renewal and affidavit
 - Survey length and questions
 - Reminder notices to manufacturers
 - Schedule through December 2011
 - Posting of registration letters
- 3:00 pm: Update on Bottom Draining Sand Filter Document
- Update by SF work group
- 3:10 pm: Open Forum

Next TAP Meeting – Thursday, November 17, 2011, St. Paul, Room 2A. Tentative Agenda Items:
1) Amphidrome, 2) Bluewater Atu, 3) Bottom draining sand filter, 4) product renewals



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

Meeting Notes – September 15, 2011

MPCA St. Paul, Room 2-A

Meeting Attendees

Committee Members	Present on Sept 15, 2011	Guests	Present on Sept 15, 2011
Ed Kerzinski	x	Philip Pedro (F.R. Mahoney & Assoc)	x
Mitch Johnson	x	Michael Benton (Norweco, Inc)	x
Loren Kohnen			
Kemp Ritter			
Sara Heger	x	MPCA Staff	
Bob Whitmyer	x	Barb McCarthy	x
Greg Halling	x	Gretchen Sabel	x
Joe Enfield		Mark Wespetal	x
Chad Viland		Gene Soderbeck	x
Sean Riley		Brett Ballavance	x
Tom Espersen	x		
Jon Olson	x		

The meeting was called to order at 10:05 am by Chair Bob Whitmyer.

Motion by Greg Halling, to approve minutes from May 19, 2011, TAP meeting. Second by Sara Heger. Minutes were approved.

Update on Products and Tank Registration

Barb McCarthy reviewed the information now available on the MPCA website. Question to county representatives on TAP – do you use the website? Do homeowners use it? Not homeowners, but it is an excellent reference for designers, installers. Comment – some of the manufacturer manuals are hard to find on their websites; having the manuals posted clearly and correctly should be part of the re-registration process.

Meeting dates for 2012 are as follows: January 19, 2012; March 15, 2012; May 17, 2012; July 19, 2012; September 20, 2012; November 15, 2012; and December 20, 2012. Forms for re-registration have been developed and were briefly discussed. There was some discussion on the new Product Renewal page, the Affidavit Form, and feedback loop via a survey.

Norweco: Singulair Green

Barb McCarthy reviewed the material relating to this treatment product. Norweco has its own UV light; this is the first product not using Salcor UV that we have reviewed. There were some additional

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diagrams that were distributed. Michael Benton from Norweco then provided more information regarding the product.

There are two types of system tanks that are used – the Singulair Green TNT is installed in a precast tank (purchased separately) and the Singulair Green comes with high-density polyethylene tanks that are manufactured by Norweco. The Singulair Green TNT comes in several sizes; the Singulair Green is only sized at 600 gpd. Also, the time clocks on the aerator for these two options are different; the Singulair Green has a 30-minute cycle vs. the Singulair's 60-minute cycle. Both aerators run for 12 hours in every 24 hours. Mike described how the units work, including a detailed discussion of system components. He stated that Norweco makes all the components, even making the resin for the tanks. Every tank is water-tested for an hour at 1300 gallons before the units are shipped out. Question – has Norweco had problems with venting? No. The Bio-Kinetic element of the system stabilizes effluent quality by equalizing extremes in flow and enhancing biological treatment. If chlorination is needed, a feed tube can be added to chlorinate the effluent; this configuration of the Bio-Kinetic meets NSF 46 as a chlorination device.

Question - are there any of these in Minnesota? There are some Singulair's, but no Singulair Green's. Michael noted that the company has a letter from NSF dated August 19, 2010, saying that their model 960-500 will meet standards also at a flow of 600 gpd. Barb reviewed the draft registration letter. She questioned the splitting of flow when multiple UV units are used – the manufacturer submitted a diagram showing two ball valves. How would the installer ensure that equal flow goes to each UV? Michael asked if the TAP had suggestions – gate valves or Dial-a-Flow could be options.

Question – are the UV units installed in tanks or buried? They are buried in native soil. Do you have any guidance about soil types or preventing frost heave? Michael stated that they can be installed in an underground basin. He talked about how Ohio allows surface discharge; they require UV disinfection and then a final aeration to ensure that the effluent meets at least 6ppm of dissolved oxygen. Some questions about maintenance were raised and answered. Question: as a homeowner, why wouldn't I just use the TNT and get more nitrogen treatment? The cost difference is minimal, about \$100, so either one could be used.

The spikes seen in the TSS data were discussed – these are troubling to some even though the monthly means meet standards. Looking more closely at the data, it looked like there was a lot of variability in the influent which could account for some of the variability. **Motion Heger, second Kerzinski, to register this device as shown in Barb McCarthy's draft registration letter once the remaining issues are resolved.** These are flow splitting and tank burial depths are two of the issues to be resolved; the third is the letter from NSF stating that the system meets standards at 600 gpd which is not stated clearly. Passed unanimously; Barb McCarthy will work with the manufacturer and NSF to resolve the issues.

F.R. Mahoney: Amphidrome Wastewater Treatment System

Barb McCarthy explained that this is the first meeting where this device will be discussed. It is an Sequencing Batch Reactor (SBR). Dr. Philip Pedro from F.R. Mahoney provided an overview of the Amphidrome submerged attached growth bioreactor, which is one type of a Biologically Active Filter

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(BAF). How a BAF works: media is always submerged in the process flow, and bacteria are attached to the media. Effluent passes near the media and is treated. In the Amphidrome, the wastewater is treated in batches. Question – how does this product handle flow way below what it was designed for? This is a fixed-film media which makes it more amenable to low-flow situations.

There are two models of the Amphidrome – the regular Amphidrome and the Amphidrome Plus. The Plus includes a denitrification reactor. Philip discussed the various aspects of the treatment systems. Question – where does the treated effluent discharge after treatment in the examples in the presentation? Subsurface dispersal is used. The group discussed the materials that Barb had included in the packet.

Question – how are specific designs created? All designs will be done by FR Mahoney. Philip is a registered professional engineer in Minnesota and he will be heavily involved for at least the next three years; eventually they will find a representative firm to work with them. Comment – so this device is only used on an individually designed basis? Yes. This technology is coming out of Massachusetts where wastewater plants now have to meet N limits of 3 mg/L; they have significant experience at meeting these limits. They have even treated the supernatant from dewatered sludge. There was a side discussion about activated sludge processes at wastewater treatment plants in Minnesota.

Product Renewal

Barb talked about her plans for how to get input on the products that are registered and expiring at the end of 2011. She is planning to survey the counties that have done Type IV systems in the past few years. Sara suggested that Service Providers also be surveyed. Barb also talked about the planned renewal letter. Question – can information also be sought from manufacturers as to how many they have sold in Minnesota? One participant doubted that a manufacturer would share problems; he felt that it was really important that Service Providers should be asked. Long discussion. Comment – LGUs should be required to electronically store all their operating permit information in a spreadsheet and then report it to MPCA. This could then be geographically mapped and made useful. Barb suggested that a subcommittee be formed to work on this so the survey can go out on Oct 3, 2011 but this was not formed. Gene Soderbeck asked why feedback is being sought – the purpose of the feedback should be determined before work is done to collect data. Bob suggested that this be discussed at a future meeting. Barb will also discuss it with Washington State.

Open Forum

There was no time for open forum topics to be raised. Persons having concerns should contact Bob Whitmyer.

Upcoming Meetings

The next TAP meeting will be held on November 17, 2011, beginning at 10:00 at the MPCA, Room 2A. Topics to include: 1) Amphidrome SBR; 2) Bluewater Atu; 3) Revised Bottom Draining Sand Filter Document (and changes to the bigger sand filter document), and 4) product renewal.

Motion to adjourn the meeting was made by consensus. Meeting adjourned at 3:15pm.

**Technical Advisory Panel
SSTS Product Registration**

Meeting: Thursday, November 17, 2011
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: September 15, 2011 TAP Meeting Notes – Review and Approve
- 10:15 am: Product Update - MPCA Website and Documents
- 10:25 am: F.R. Mahoney – Amphidrome Wastewater Treatment System (second meeting)
- Overview of submittal (residential and high-strength) – Barb McCarthy
 - Overview of product (additional information submitted) – Philip Pedros, PhD, PE
 - TAP Questions, Discussion and Recommendations
- 12:05 pm: Lunch
- 12:45 pm: Bluewater ATU
- Overview of submittal – Barb McCarthy
 - Overview of product – Dougie Colburn (contacted)
 - TAP Questions, Discussion and Recommendations
- 1:45 pm: Drainfield Rock Document (revisions)
- Recommended changes to document
 - TAP Questions, Discussion and Recommendations
- 2:00 pm: Product Renewal Process
- Status Report
 - TAP Questions, Discussion and Recommendations
- 2:15 pm: Open Forum

Next TAP Meeting – Thursday, December 15, 2011, St. Paul, Room 2A. Tentative Agenda Items:
1) Bluewater Atu (continuation, if needed), 2) Product renewals (six manufacturers)



Minnesota Pollution Control Agency

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

Meeting Notes – November 17, 2011

MPCA St. Paul, Room 2-A

Meeting Attendees:

Committee Members	Present on Nov 17, 2011	Guests	Present on Nov 17, 2011
Ed Kerzinski	x	Dr. Philip Pedro (FR Mahony & Assoc)	x
Mitch Johnson			
Loren Kohnen	x		
Kemp Ritter			
Sara Heger	x	MPCA Staff	
Bob Whitmyer	x	Barb McCarthy	x
Greg Halling	x	Gretchen Sabel	x
Joe Enfield	x	Mark Wespetal	x
Chad Viland		Gene Soderbeck	x
Tom Espersen	x	Brett Ballavance	x
Jon Olson	x		

The meeting was called to order at 10:05 am by Chair Bob Whitmyer.

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

Amphidrome System: Barb McCarthy reviewed the discussion at the September 15th meeting. The Amphidrome is a Sequencing Batch Reactor (SBR); it is different than all the other devices that have been registered so far. Barb reviewed the materials and outstanding questions, as well as provided draft registration letters for residential and high-strength wastes. There are two products; the Amphidrome and the Amphidrome Plus. The Plus system includes chemical feeds that allow the device to meet nitrogen limits and could also be used for Phosphorus. Dr. Pedro sent large binders of test data to each TAP member; this data was discussed.

A member raised his concerns that maintenance may not occur, and that the systems will not meet the high standards. This is not unique to the Amphidrome. The regulatory system is problematic in that there is not universal enforcement of maintenance requirements. All these systems will have operating permits; this needs to be overseen. One idea would be to set up a task force to possibly develop recommendations on how to ensure maintenance.

Question: how is the ETV testing process different from NSF? The ETV testing is done over a longer period, otherwise it is similar. Question: what does the rule require for testing? NSF, ETV and others

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are listed; the testing that was done on Amphidrome meets these requirements. The testing for fecal coliform bacteria was not conducted. Question: Has Dr. Pedro met with engineering firms in Minnesota? Yes, and they have welcomed the information on the system; there is a need for a technology that is able to meet a nitrogen standard of 10 mg/L nitrate-nitrogen (this is a drinking water standard).

Question: why were there some data that was reported without flow data? Flow data is not required for all systems in New Jersey; the meter itself costs \$1,000 and there is resistance. Also, the installation of a flow meter requires a trap that adds to increased installation costs. Sara Heger noted that when the University designs a system, they will install meters on the water supply lines so they get an idea of flow without the hassles involved in maintaining a meter on the dirty water flow. Dr. Pedro noted that they put the flow meter on the pipe where the final effluent leaves the system, this way it is measuring the treated effluent.

Barb McCarthy reviewed the draft letter for residential approval. The product would be registered at A2 and B2 as a Type IV system, and could be used as a Type V if the application was planning to use disinfection since Dr. Pedro has said that all designs will be reviewed by the manufacturer's engineer. Question: why are the flow rates in the draft registration letter overlapping? This is to provide flexibility for use in different settings. Comment: on the top of page three, it should be clear that even the engineers need to be Advanced Designers (AD).

Question: what if the AD chooses to install disinfection, would it be a Type V? Answer: Yes. Dr. Pedro noted that they would be interested in eventually being registered for Treatment Level A. Looking then at the High Strength Waste registration letter, the Amphidrome would be registered at Treatment Level C. This is consistent with how other devices for treating HSW are registered. **Motion Heger, to recommend that the Amphidrome be registered as shown in the draft letters, as amended. Second by Kohnen. Passed unanimously.** Barb provided the TAP with draft At A Glance List showing how the product would be registered, as well as the listing spreadsheets. The addition an additional column to the At A Glance listing where more information on nitrogen treatment would be provided; there were no additional concerns raised.

LUNCH BREAK

Product Update

Barb McCarthy is in the process of updating the product registration list. The update includes adding products to the list, updating operating permit templates, 2011 rule updates, revising the rock media document, and eventually fixing web links.

Bluewater ATU

The original submittal was sent in February 2011, but it got lost in mailing or processing and was never found. The application was resubmitted in September 2011. Dougie Coburn, the manufacturer's

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representative, could not attend the meeting nor via a telephone call. The B-400 model was tested and approved by NSF 40. The results indicate that the treatment product could qualify at Treatment Level B2. Approval has been reported to be obtained in 23 states. There is no reciprocity between Minnesota and other states.

TAP has received all the information about the product that was received BY the MPCA. Some pages of the copy were hard to read. Barb reviewed the checklist, and found some areas which needed additional information. The questions/issues included:

- Why was only the B-400 listed on NSF website?
- Did NSF issue an up-scale for the larger units up to B-1500 (1500 gallons per day)?
- What is the rated organic loading for each model?
- How is the system sampled?
- Need the NSF approval documentation
- LGU checklist for system construction

Barb drafted a letter and sent it to Dougie. There is an indication that Dougie may drop larger models for registration and only seek registration for the B-400, B-600 and B-900 models. Brett cautioned the members to consider the units that were used (Imperial) and how the units are written (commas, apostrophes, etc.). It was noted that the B-400 model does not meet a 3 bedroom dwelling in Minnesota. It was surmised that no trash tank is needed. It was noted that influent for NSF testing already has solids ground-up, which may not be reflective of everyday use at a home. Blowers should have an alarm/sensor to indicate problems.

Loren had general concerns on maintenance (of all systems). An operating permit would have maintenance requirements, but can be difficult to enforce. This product would be registered at Treatment Level B2 which would have 3 feet of vertical separation distance and be protective if maintenance was not performed as specified in the operating permit.

A complete application is needed. TAP thought it would be very helpful if Dougie would be available for questions either at a meeting or via phone.

Drainfield Rock Document

Sara had brought up some issues to Barb regarding the drainfield rock document. Some changes were simple clean-up changes. TAP reviewed and discussed the following:

- Page 3 – sewage influent numbers needed change due to new rule.
- Brett mentioned the limestone freeze/thaw test for fracturing and breakage that Iowa uses. Should see if it is applicable to Minnesota. Barb will query the Aggregate and Ready Mix group. It was believed that limestone rock specs used by MPCA - Solid Waste have been incorporated into the rock document already. Yes it has been.

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- Page 4 – Much discussion took place on when bottom area reduction could be taken if more sidewall was employed. The question was mainly with pressurized trench systems receiving septic tank effluent (STE). Some thought that ponding should not occur in pressure systems receiving STE, and if ponding occurs, the system was not functioning as intended. Some thought that the utility of the sidewall did not change if ponding occurred if either pressure or gravity were used. The discussion also touched on whether the biomat caused “creeping failure” with serial distribution or whether the bottom area had an effective long-term-acceptance-rate. Some stated that they opposed any reduction in sidewall for systems receiving STE.
- It was mentioned that smaller foot-print systems may be needed for small lots. If no reduction was given for sidewall using pressure distribution, then gravity would be chosen, which would be less desirable. Pump to gravity will increase because if you pump to gravity you can get a reduction. A 24-inch sidewall reduction in sandy soils could not be taken due to the bottom area loading rate being greater than 2.0 gpd/ft². A loading rate less than 2.0 gpd/ft² is required to ensure virus removal takes place.

There appeared to be good agreement (and supported in rule) that no bottom area reduction should be given for additional sidewall as a reduction is already provided due to the pretreated waste. Giving an additional reduction for more sidewall was “double dipping”.

A motion was made by Ed Kerzinski and seconded by Sara Heger to not allow bottom area reduction for pressure trenches receiving STE with additional sidewall. A review of the rule language would support allowing a reduction. An ensuing discussion took place regarding the Recommended Standards and Guidance documents; are they really part of the rule? The answer appeared to be yes. It was suggested, and appeared to have consensus, that the work “Recommended” should be removed from the title of the document.

Motion and second was withdrawn, which appeared to be due to the allowance of bottom area reduction in the rule. Members still appeared to be split on the issue, with some not supporting a bottom area reduction for any trench system receiving STE, and some supporting a bottom area reduction for pressurized trench systems receiving STE.

A synopsis of the results of the discussion was as follows:

When Can Bottom Area Be Reduced if More Sidewall is Employed?		
	Pressure	Gravity
Septic Tank Effluent	Yes	Yes
Treatment Level A or B	No	N/A

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**Greg Halling made a motion to accept the changes in the document. Seconded by Ed Kerzinski.
Motion passed.**

Product Renewal Status Report

Barb has sent letters to six manufacturers, ~65 Service Providers and four local units of government with advanced treatment units (Blue Earth, Wright, Cook and St. Louis). She has received information from no manufacturers, seven Service Providers and two local units of government. There will be more detailed discussion at December's meeting on product renewal. Washington State renews the products every year. Barb remotely attended one of Washington's meetings and found the following:

- UV devices were not installed properly
- UV devices were not operated properly
- UV – power surge problems
- UV – placed in pump tanks to avoid settlement issues
- It was stated not to look at an operating UV blub, as it can burn your eyes.

The renewal letter will be the same as the initial approval letter with any needed changes (like the Treatment Levels). Don't want multiple letters on the web, so the renewal letters will replace the initial letters.

Chambers

The agency has gotten reports that some chambers are filling in with soil. Due to these instances, some installers in Beltrami County are not using chambers any more. This will be discussed at the next Advisory Committee meeting on November 29, 2011. The U of M workshop on November 30, 2011 will discuss the issue, too. Any guidance document developed is to be reviewed by the TAP.

Hubbard County does not have that many chambers filling up. Any assessment needs to include the sizing and vertical separation distance. One person theorized that the filling could be occurring soon after backfilling as the fill would be loose and mobile during rain storm, or filling if left open for final inspection. Evidently, Infiltrator has compensated with the use of geotextile fabric, or newer products have steeper louver angles. There was a question on the age of the chambers and if a 40% reduction was used. Barb asked the both manufacturers (Infiltrator and ADS) to investigate and get back to her.

Open Forum

1. Will Haapala is new SSTS program manager.
2. Task force to encourage enforcement of O and M

Enforcement of O and M is likely a larger issue than registration of the products. Should LUG's be given a generic Administrative Penalty Order (APO) for enforcement if local politics fail? In the

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hazardous waste program, the metro counties determine generator non-compliance, and then it goes to the agency to determine appropriate enforcement to be taken. This has worked well, but is a long process. However, businesses are different than homeowners with SSTs. Owners of Type IV and V systems need to get variance to wake-up the homeowner to say that O & M is necessary of the systems to function properly. Compliance status in St. Louis is estimate at 50 percent. St. Louis has lessened their requirements to get better compliance. There is little political will to enforce the 50 percent non-compliance on non-holding tank systems.

Should a task force be formed to evaluate this issue? Operating permit templates are available for use, but this doesn't help compliance. The first enforcement letter issued by St. Louis county get a fairly good response. Should a contract be required at day one? System owners are shopping around for the best price. MSTs with state funding may not get any information on how the system is working. The state should require to be cc'd on data submittal as a condition of the grant/loan, as this could help the counties. Does the MPCA do enforcement against a sanitary district? No, unless it has a state permit. Should the rule have a consequence if maintenance is not being done? The owners must have an accountant to see if finances are OK for financial assistance programs, should also have same requirements for monitoring. Chasing down non-submittal is a huge staff time issue for operating permits. Should a government agency do the O and M so it is more responsible or responsive?

This needs additional discussion at a future TAP meeting; the full TAP should discuss this issue. This needs to be added as an agenda item for a future meeting. No special task force was formed.

3. Products – Advanced Design (AD) licensing requirements

Will the AD license be enforced after the rule deadline date? How are current designers being notified as some do not have email. There are lots of people doing AD work now, so LGU's will bear the bad news of telling them that their design is not acceptable. The agency should be getting the word out. We need to also tell manufactures who sell treatment products, too. This should be easy to enforce because they will be working w/o the required license. The Agency needs to inform designers by written/hard notice (not e-notice). This issue should be part of the MOWA conference (still MOWA is a small percentage). MPCA needs to explain that the date of ordinance adoption does not affect when an AD is needed.

4. Damaged soil and Type IV Systems

Damaged soil with pretreatment – Type III, Type IV or Type V? Bring up at Monday's SSTs staff meeting. Suggest a possible hybrid Type IV (treatment) and Type III (dispersal).

December 15th is the next TAP meeting. Christmas lunch; members bring something to share?

Motion to adjourn the meeting was made by consensus. Meeting adjourned at 3:15pm.

Note: At 11:30, the TAP is invited to participate in the Municipal Division Holiday lunch in the Board Room at 11:30. If you want to participate, please let Barb know by Monday, Dec 12th.

Technical Advisory Panel SSTS Product Registration

Meeting: Thursday, December 15, 2011
10:00 am to 3:00 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: November 17, 2011 TAP Meeting Notes – Review and Approve
- 10:15 am: Product Update - MPCA Website and Documents
- 10:25 am: Product Renewals
- ANUA (formerly Bord Na Mona)
 - BioMicrobics
 - Delta Environmental Products
 - Orenco Systems
 - Premier Tech Aqua
 - TAP Questions, Discussion and Recommendations
- 11:30 pm: Lunch
- 12:45 pm: Product Renewals (continued)
- Hoot Systems – Ron Suchecki
 - TAP Questions, Discussion and Recommendations
- 1:15 pm: Chambers and Soil Intrusion
- Identification of issue; Advisory Committee Meeting - November 29, 2011
 - Manufacturers input (revised Manuals and Fact Sheets/Letters) by phone
 - TAP Questions, Discussion and Recommendations
- 2:00 pm: Basic Designer/Advanced Designer – Type IV
- MOWA letter, dated November 28, 2011 and Advisory Committee Meeting Notes
 - TAP Questions, Discussion and Recommendations
- 2:30 pm: Open Forum

Next TAP Meeting – Thursday, January 19, 2011 (if needed), St. Paul, Room 2-B.

Some issues: 1) Sustained conformance with operating permits, 2) Open bottom sand filters, 3) Follow-up on Product Renewals, if needed.



Minnesota Pollution Control Agency

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

Meeting Notes – December 15, 2011

MPCA St. Paul, Room 2-A

Meeting Attendees:

Committee Members	Present on Dec 15, 2011	Guests	Present on Dec 15, 2011
Ed Kerzinski	x	Ron Suchecki, Hoot Systems	x
Mitch Johnson	x	Jeff Iverson, Infiltrator Systems	x
Loren Kohnen		Ben Berteau, Infiltrator (phone)	x
Kemp Ritter	x		
Sara Heger	x	MPCA Staff	
Bob Whitmyer	x	Barb McCarthy	x
Greg Halling	x	Gretchen Sabel	x
Joe Enfield		Mark Wespetal	x
Chad Viland	x	Gene Soderbeck	x
Tom Espersen	x	Brett Ballavance	
Jon Olson	x		

The meeting was called to order at 10:07 am by Chair Bob Whitmyer.

Motion by Sara Heger, to approve minutes from November 17, 2011, TAP meeting. Second by Greg Halling. Some corrections were discussed and Barb McCarthy agreed to amend the minutes to reflect this information. **Minutes were approved.**

Barb reviewed the listing documents. Several people commented on how the recirculating sand filter was listed; the group will discuss the guidance document for this technology at the next meeting. The drainfield rock document had also been updated cosmetically and has a new look. Bluewater ATU needs to do some additional work; they anticipate a possible visit to the TAP in March 2012 to discuss their product. Barb noted that Dr. Phil Pedros contacted her and thanked the TAP for their work on review of the Amphidrome system.

Product Renewal:

Barb distributed a two page summary of products up for renewal at the end of this year, see attached. She discussed the information that has been submitted. The group discussed the new tanks that go with the Orenco systems. Barb will look into these new tanks and report back to the TAP. She noted that there a pretty good response and got some more information. Sara shared a question that has been asked – if a product is registered at Treatment Level A, does it automatically meet the lower levels? TAP members noted that this is something that has been discussed previously; it should be clear to people that if you meet Level A then you also meet Levels B and C.

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Barb then reviewed the draft renewal letter that was prepared. She plans to send the renewal letters out on January 3, 2012. The new letters will be posted on the website and will replace the initial product registration letters. Question: what would prevent someone from being renewed? There would have to be consistent complaints across several areas; an audit may also be conducted to determine whether problems were with the product, the manual, or the design/install. Also, there would be a problem if a renewal request was not submitted.

The role of the manufacturer in product problem triage was discussed. Many contractors are reluctant when it comes to contacting the manufacturer – they fear that it may reflect on the work they did. But they should be urged to do so. **Motion Halling, second Viland, to approve renewal of the five product lines (ANUA PuraFlo Peat Filter, Delta Environmental Products Ecopod, Orenco Systems AdvanTex, Premier Tech Aqua EcoFlow Biofilter, and BioMicrobics RetroFAST and MicroFAST) that had submitted renewal requests. Passed unanimously.**

Since we were ahead of schedule, the 2:00 pm item was moved ahead to the morning part of the meeting. Gene Soderbeck came in and talked about the Minnesota Onsite Wastewater Association (MOWA) proposal for a minor restructuring of the license categories to develop either a Basic+ or AD-classification that would be able to design Type IV residential systems. A TAP member stated that he struggles with this – he does not feel that a Basic Designer, even if he's taken the Service Provider course, would have the ability to design a system for a restaurant. This would be opening the door to degradation of the license that we've established today. He is concerned about high strength waste (HSW) in particular. Another member noted that a big problem would be having the Basic Designer know when they encounter a HSW situation – this is not always obvious (he cited the example of a sanitation building at a campground).

Gene stated that his concern is that there are enough designers who would be able to install a pretreatment device on a "failing" system to bring it into compliance. He wants to make sure that these relatively simple situations can be fixed with relatively simple solutions. Discussion – the group cited several examples where HSW problems were encountered in unexpected situations. It may be best to make the split at residential only (no commercial) and restrict it to one and two (i.e. duplexes) homes. There is less environmental risk in these applications than there would be for larger or commercial systems. Question: why would a 2499 gpd residential only system not be as appropriate for this license as for a duplex? The difference is risk; the more homes there are the more land that needs to be involved and the more potential risk to the environment. Also, you would have to include a collection system.

Gene asked 'what practitioners are really asking for'? What about collection? What about up to 2500 gpd without collection and residential only? Some concerns were raised: Not sure why a change is necessary? We don't want to make things a lot more complex by adding more 'lines' that divide what practitioners can do. Sara stated that U of M preferred the approach where the Basic was expanded to include Type IV's; this way all new Basic Designers would be able to do the full set of options for single family homes.

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The trend of building Type IVs was discussed. The actual number of Type IVs is quite small; so is the number of systems over 2500 gpd. Discussion – there will be pressure to expand the AD- to include commercial systems and clusters of up to 10 homes, etc. If a line is drawn, it would have to be very clear, especially if it is not reflected in rule but is just done through policy. Note: this also would apply to Inspectors. Another solution would be to have the distributors hold AD licenses.

Break for Lunch. The potluck was very nice, and the band played masterfully.

Hoot – Product Re-registration and New HSW Product

Ron Suchecki provided some information on a new treatment device that his company has developed. He stated that most of the Hoot systems in Minnesota are in Olmsted County. Greg Vertin at Wieser Precast Steps is the local rep, and has been staying involved in maintaining the systems. This will change soon, since they are not Service Providers. Ron noted that there had been some issues with the use of Hoot systems in applications that are too big or not just residential waste. They have addressed this by developing a new treatment device called the Hoot MTS- CTS that includes fixed media and fine air diffusion – they use a dissolved oxygen meter and add air at a variable frequency to maintain a specific level in the wastewater. Ron indicated that this product is more suitable for high strength waste. These devices are completely scalable based on use, flow and strength. Ron showed some slides demonstrating some installations of the systems.

Ron presented data from the Waco test site, where this system was tested for a short period of time. The system was able to achieve a level of nitrogen less than 10 without carbon addition due to the low variability of total nitrogen in the influent. Hoot cycles the air so that anoxic zones are created which reduces the nitrogen. Hoot also has a system for very large systems that uses a rotating fixed film activated sludge system. The advantage of this system is that it has a very small footprint for the amount of wastewater it can treat. They use ceramic membranes made by SJE Rhombus. Hoot is using this as a polishing filter. This filter provides nano-pore filtration, physically separating the clear water from everything that made it less clear. They are using this to meet fecal coliform standards in some places; it is more cost effective for large systems than UV or chlorine. Ron also showed an example O and M manual; these are custom designed for each installation. Hoot may be proceeding to register these products for HSW and for use in systems with flows between 1500 and 10,000 gpd.

Question: for this nitrogen data, was the liquid temperature measured? Yes. Question: If the testing was done in Texas, how would the system work in MN? They use insulation and count on the heat in the wastewater to maintain the temperature levels needed for effective treatment. Question: how are the diffusers maintained if they are under the media? They are built in a robust way so maintenance needs are reduced, otherwise the system is dewatered every five years for inspection and maintenance. Question: what about hardness and other minerals – do these plug up the system? Calcification can be a problem, it must be dealt with. Question: will you be submitting data on the bacterial removal? Ron stated that he does have this data; he will prepare an HSW application.

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Chambers and Soil Intrusion:

Chad Viland presented some information on wildlife intrusion into chambers in Faribault County. Barb had some pictures from Freeborn and Hubbard Counties as well. Ben Berteau was connected by phone. There was a discussion relating to gopher intrusion – the best way to deal with this is to trap or kill the gophers and/or remove the grubs that they feed on. Some examples of soil intrusion were shown, these were in situations where the sand that the systems were set in was fine, uniform and unconsolidated and it sifted through the louvers like sands through the hourglass. It could be happening at the time that the soil is backfilled around the chambers. Long discussion. Over-excavation could also exacerbate the problem.

Jeff Iverson made the point that when Infiltrator is called, they will help to troubleshoot and then fix the problem. They will send an email to all the counties urging them to contact them at the first sign of problems so they can help with the fix. The option for fixing this is to use filter fabric over the chambers when they are being installed in the trenches. Infiltrator has provided a memo that explains this fix. Comment: this write-up should be amended to include the particle size so it is clear what they are talking about when they say “fine sand”. Ben agreed to look into it and edit as needed. Bob told Ben that in Minnesota we use the USDA classifications; Sara read from the rule in 7080.1100 subp 31 which includes a specific definition for fine sand. Ben will review this reference and make appropriate changes to the document.

Dick Bachelder was not able to be reached by phone. He had sent Barb a document that discusses how to avoid this issue in ADS chambers. The next step for both products will be to update the manual with these techniques. Barb will work with the manufacturers and will provide them with a list of local government contacts so they can inform them of these practices.

Motion to adjourn the meeting was made by consensus. Meeting adjourned at 2:55pm. Next meeting is scheduled for January 19, 2012; this meeting will only be held if necessary and at this point it looks like it may not be needed. The next scheduled meeting after that is in March 2012.