TECHNICAL REVIEW AND ADVISORY PANEL

ONSITE SEWAGE TREATMENT AND DISPOSAL SYSTEMS

ADVISORY TO THE DEPARTMENT OF HEALTH

AUTHORITY: SECTION 381.0068, FLORIDA STATUTES

TECHNICAL REVIEW AND ADVISORY PANEL (TRAP) MEETING

DATE: Wednesday, August 31, 2016
TIME: 10:00 a.m. Eastern Time
PLACE: Florida Department of Health in Orange County
South Side Health Center (Auditorium)
6101 Lake Ellenor Drive
Orlando, FL 32809

THIS MEETING IS OPEN TO THE PUBLIC.

Agenda

1. Introductions

2. Review minutes of October 22, 2015 meeting

3. Old Business
   15-02 Nitrogen-Reducing Media-Lined Drainfields

4. New Business
   16-01 Drip Emitter System Slope

5. Other items of interest to the Technical Review and Advisory Panel

6. Public Comment

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TECHNICAL REVIEW AND ADVISORY PANEL (TRAP) MEETING MINUTES

DATE: Monday, October 22, 2015
PLACE: UF-IFAS Extension Office Auditorium
Orange County
6021 South Conway Road
Orlando, Florida 32812-3604

Members present were:

Scott Johnson, *Florida Engineering Society (by phone)*
Roy Pence, *Home Building Industry, Vice Chair*
Ken Odom, *Home Building Industry, Chair*
Pamela Tucker, *Real Estate Professional*
Sonia Cruz, *Environmental Health*
Scott Franz, *Soil Scientist*
Martin Guffey, *Septic Tank Industry* (by phone)
Ron Davenport, *Septic Tank Manufacturer*

Alternate members present:

Mary Howard, *Environmental Health*
Clay Tappan, *Florida Engineering Society*
Johanna Whelan, *County Health Department* (by phone)

Department of Health staff present:

Ed Barranco, *Environmental Administrator*
Dale Holcomb, *Environmental Administrator*
Eberhard Roeder*, Engineer*
Bart Harriss, *Environmental Manager*
Marcelo Blanco, *Environmental Consultant*

Absent members and alternates:

Russ Melling, *Consumer Representative*
Vic Godlewski, *Local Government*
Mark Cotton, *Home Building Industry*
Edward Cordova, *Local Government*
Tony Macaluso, *Real Estate Professional*
Oren Reedy, *Soil Scientist*
Robert Baker, *Septic Tank Manufacturer*
Glenn Bryant, *County Health Department*

Others present:

Dammann Anderson, *Hazen and Sawyer*
Scott Thomson, *Plastic Tubing Industries*
Roland Reis, *DOH Legal (Polk County)*
Rick Hicks, *DEP*
Andrea Sampson, *JMI Center for Prop. Rights*
Quentin Beitel,
Dominique Buhot, *Contractor*
Yelitza Jimenez, *DOH Orange*
Kim Duffek, *DOH Orange*
Adam Lee, *Brownie's Septic*
Derek Woodruff*, Brownie's Septic*

1. INTRODUCTIONS

Chairman Odom called the meeting to order at 10:05 a.m. and provided a brief history of the TRAP. The TRAP members and alternates introduced themselves as did the others present. Nine out of eleven groups were present, representing a quorum.

2. REVIEW MINUTES OF LAST MEETING

The TRAP reviewed the minutes of the September 14, 2015 meeting.

MOTION by Pam Tucker and seconded by Sonia Cruz, for the TRAP to approve the minutes from the September 14, 2015 meeting. All were in favor, none opposed, and the motion passed unanimously.

3. OLD BUSINESS

a. Pam Tucker's Emailed Questions

Dale responded that the questions dealt with whether we had addressed the issues that brought up during the review of the rule reduction proposal. While the current answer is "no" the items that were raised as issues will be addressed and the group consensus on those items will be incorporated before the rule reduction proposal comes back to the TRAP at a future meeting for review and vote.

b. Ken Odom asked about an item listed on the web-site that is not on the agenda and about cleaning up old issues and the rule reduction before moving on to new items.

Dale responded that issue 15-06 came in after the agenda was set and will be on the next meeting. Regarding cleaning up old items, he agreed that that needed to be done however the nitrogen reduction has taken a priority over the rule reduction. Also, having several issues addressing the same language was a frequent occurrence and gets addressed when the rulemaking documents are created. The TRAP receives a document that shows how the language conflicts are resolved if the exact wording cannot be accommodated.

4. NEW BUSINESS

a. ELECTION OF OFFICERS

Scott Franz nominated Ken Odom as chair, Pam Tucker seconded.
Ken Odom accepted the nomination.
The members voted and elected Ken Odom as chairman with only Mr. Odom voting in opposition.

Scott Johnson joined by phone at this point in the meeting.

Sonia Cruz nominated Roy Pence as vice-chair, Ken Odom seconded.
The members voted and unanimously elected Roy Pence as vice-chair.

b. RULE ISSUES

15-02 Nitrogen-Reducing Media Lined Drainfields

Eberhard Roeder made a presentation regarding the recently concluded Nitrogen study and the nitrogen reduction proposal before the TRAP.

Ron Davenport arrived.

Ken asked about the timing and the rush to adopt the liner proposal. Dale responded that now that the study was finished, we wanted to get the systems available and the lined system lends itself to the prescriptive code hopefully by the end of the year or as soon as possible. The incorporation plan is to get the simplest of the tested systems into the prescriptive part I of the rule and incorporate the other systems as PBTS systems under part IV of the rule. The final implementation step would be to create a place in the rule for those systems that might be able to be monitored less frequently than the PBTS.

Scott Franz asked about the performance standard for the lined systems. Dale offered that as part of part I, there would not be a specific performance number but more of an expected range around 60%, similar to 24" separation expected to meet 30% reduction.

Ed Barranco offered that as the BMAP process moves forward these would be the systems that provided some nitrogen reduction without reaching the higher levels of treatment available in the more complicated systems.

Roy Pence asked if these systems are proprietary and if they have been installed someplace else with liner, Dale responded that it wasn't and described the general layout of the system. Also, while the lingo-cellulosic material had been used widely, the liner approach hadn't.

Damann Anderson offered that the study was ended in August, 2014, he had estimated the length of life for the media, but we don't know for sure. The issues are in the details: we need to get water into the lingo-cellulosic material, perhaps with a finer mix, and some water is bypassing liner. A larger liner footprint may be necessary.

Ken Odom brought up that some of the PBTS systems in the Florida Keys are not meeting standards. Damann agreed that mechanical systems have a hard time meeting 10 mg/L nationwide as well as in the keys. He suggests ironing out details out before implementation. Damann recommended performance monitoring and that DOH is not prepared to implement this system the first of the year. Nitrogen loss to denitrification. Water that made it into liner had 95+% reduction, but water has to get into the liner. They had installed one bathtub and two drained liners that worked very well.

Pam asked about some of the other systems in the study. Damann responded regarding various design criteria for the different systems in the study and the system under question in the rule proposal.

Scott Franz asked how much concentration reduction is dilution as he has some experience with that site. Damann responded that they were tracking rainfall and were able to make some conclusions about dilution and evapotranspiration.

Clay Tappan discussed the allowance for engineer to modify layers to facilitate getting more of the effluent into the liner. Big problem how to motivate water to go through. Damann, did not use saw dust but coarser urban waste wood. Makes it harder for water to move from fine soil into coarse wood material. But was able to measure performance. Measuring performance is missing from the rule proposal. Scott Franz asked if you need to make the media even finer to get flow out of central Florida fine sands. Damann suggested that that might not be necessary, the BHS3 system worked well with wood/sand mix.

Martin Guffey, concerned that while the simplest proposal it might not provide long-term reliable treatment. This proposal provides an unfair advantage over other system that currently are tested. The timeline is too short. Propose to table.
Want specific specifications for the system and the media

MOTION by Martin Guffey to table the proposal. Seconded by Pam Tucker.

After the motion was seconded, there was more discussion:

Dominique Buhot offered that more research and more study more work to get system approved. Cost is not mentioned. 60% reduction is similar to drip systems. Also, PTI has media-liner patent, “any media source with a liner” so public research would support that particular product. Recommend to look further into patenting issue.

Sonia asked some questions about patent suggesting that the patent language is too broad.

Dominique Buhot, Damann Anderson, Sonia Cruz, Scott Franz and Ken Odom had a lengthy discussion regarding system costs.

Scott Franz suggested develop construction plan and get several bids from contractors.

Pam Tucker offered that there are no innovative system evaluation requirements and it provides an unfair advantage against proprietary systems that go through innovative testing and that costs will increase if demand increases.

Ken Odom asked a question about BMAP-model and reduction decision-making. Damann responded that TMDL establishes allowable load. BMAP is forum to discuss different sources, everybody is at the table and decides how we meet the goal.

Clay Tapan offered that for simple plastic and wood the price could be cheap. If performance requirements, warranty monitoring are required, costs would go up.

Mr. Tappan Called the question.

> Martin Guffey restated his MOTION to table. More information on long term reliability and specific language regarding media design, installation and maintenance of the system.
>
> Mr. Guffey will email specific tabling language to Ron Davenport.

Email received through Mr. Davenport:

To: Davenport, Ron
Subject:

Report by project engineering group on implantation

Specific language regarding media, design, installation & maintenance of systems

Allow for some assumption of guaranteed performance

Allow for development of additional technologies without cumbersome approval process

Cynthia Guffey,VP
Martin Septic Service, Inc.

Pam Tucker second the motion and the MOTION PASSED with Sonia Cruz voting in descent.

15-03 Collection and Hauling Logs for Septage Disposal Services Trucks
Roland Reis, DOH General Counsel, presented the issue to the panel. The issue is based on experiences during enforcement regarding septage disposal. Currently septage service activity logs are maintained at the end of day in a central office. When asked for information, some information is missing, perhaps because it is not recorded at the time of service provision. His goal is to have the logs maintained during the day on the trucks providing concurrent and consecutive information so that tracing from collection to final disposal is feasible. He offered that the proposal makes sense, makes record keeping easier for contractors, and makes inspection of records more reliable. Additionally, he observes that contractors do not provide receipt and accept only cash. They should provide receipt detailing the services provided. This rule change would require receipts to be provided.

Ken Odom expressed concerns about the burden of maintaining such a truck log and how quickly logs have to be moved how much time it takes. He suggests to survey pumpers for input.

Pam Tucker pointed out that we try to have reasonable practices and keep in mind the small operator will not have a staff to maintain paperwork.

Dominique Buhot distributed a waste disposal manifest used by Orange County Utilities as alternate to DOH requirements. He suggests a 3-year retention rather than 5 years. Offers that the manifest would simplify reporting.

Derek Woodruff added that Florida Industrial Pretreatment Association developed Dominique's form. Most utilities require its use and that it provides better at tracking cradle to grave and suggests that the manifest is the way to track cradle to grave.

Roy Pence made a MOTION to TABLE the issue to get more information from FOWA. Ron Davenport seconded.

Discussion: Martin Guffey offered that 95% of pumpers do what they are supposed to, the other 5% are causing the problems.

MOTION PASSED unanimously (Clay Tappan had stepped out during the vote)

The Panel took a break from 12:15 until 12:45

Clay Tappan had to leave during the break.

15-04 Non-Employment of Septic Tank Contractors with Suspended/Revoked Licenses
Ken Odom offered that a revoked general contractor can still work as carpenter afterwards. This is the only way he has to make a living.
Roland Reis offered that some bad actors do not need to be involved in the industry. The issue also comes from contractors that want to do their job right. After a license is revoked, they work for their friend or relative and are still doing the work. Contractors ask what can the department do to keep the individual from doing the work? It is a frequent occurrence.
One option to prohibit employment.
Other option, notice to contractor that employee has been revoked, cannot do some activities (e.g. no contract negotiation).

Martin Guffey offered that it is about time for this to happen. Described an operator who did illegal dumping and lost his license. Now working for plumber, using the same truck, changed truck label, still doing the same thing. Need more enforcement authority over plumbers.

Ken Odom offered concern that the hiring contractor might not know that the employee is a revoked contractor.

Sonia Cruz suggested to make available information about revocation on web-site.

Pam Tucker offered that DBPR lists of violations for realtors, suggests that a graduated penalty would be appropriate.

Roland Reis responded that revocation is the end of a lengthy process, so that by the time the revocation occurs, it is clear that this contractor does not deserve their license anymore. An alternative could be a requirement for the employee to disclose revocation during hiring.

Ken Odom offered that in general he supports the concept but it needs more discussion legally to see what can and cannot be done. An employer can hire bad apples who were never in the business before.

Pam Tucker and Roland Reis had a discussion about conditions for revocation. A contractor can apply for reinstatement after 5 years. The goal is compliance. Some people are not caring about that and are just in it for the money. For the department to get to the point to revoke a license, much has to have happened. Usually start with first violation for 50/200 dollars, and then repeat offenses before we get to a revocation. The person's behavior during the revocation can impact the department's reinstatement decision.

Scott Johnson made a MOTION to APPROVE with edit that on line 9 "letter or warning" change to "letter of warning". Martin Guffey seconded the motion.

Discussion: Several options were discussed, perhaps tabling would be better to work out details.

Motion FAILED with 3 in favor (Scott Johnson, Martin Guffey, Johanna Whelan) and 5 opposed (Pam Tucker, Sonia Cruz, Ron Davenport, Roy Pence, Ken Odom).

Pam Tucker made a MOTION to TABLE and reword regarding today's discussion regarding employer's responsibility to not hire and employee's requirement to disclose.

Discussion regarding duration of disclosure responsibility related to the duration of the suspension or revocation. Suspension may be for variable time, revocation can be "permanent" but by statute, a permanently revoked person may reapply after five years.

Roy Pence seconded the motion to table.
MOTION PASSED with one vote in descent (Scott Johnson).

Pam Tucker asked where the size of the penalties come from. Roland Reis responded that they are similar to other contractor language but the penalties are high because the offenses occur after the license was suspended or revoked.

15-05 Disciplinary standards for voluntary inspection.

Roland Reis presented the issue. Gross negligence, misconduct is general contracting language. This proposal adds three activities to an existing disciplinary standard. He offered an example: A realtor called a contractor. Contractor supposedly pumped it out and indicated that the system was in good condition. The system included a tank with two outlets, one led to a failed drainfield and the other let to an illegal drainfield. House was bought and the system failed within a month. Department pursued an administrative action that resulted in fine and suspension. Adding voluntary inspection to the standard would assist in the enforcement.

Discussion regarding voluntary system inspection, promulgation process for the voluntary inspection requirements, partial inspection and written authorization to opt out of parts of the inspection, concerns that some inspections might be penalized, inspecting in-use systems versus dormant systems, whether sizing is part of the inspection, drive-by inspections need to be stopped.

Martin Guffey offered a case where they did an inspection, found deficiencies, report that the homeowner was given had been whited out by the realtor. Provided other examples, offered that we need an inspection report that gets copied to the DOH, Homeowner and realtor.

Ken Odom wants to make sure we are not fining the inspector when something is wrong and the inspection is terminated.

Dominique Buhot and Ken Odom discussed the requirement that the owner or person having control of the system needs to be the person ordering the inspection. Ken suggested that he bring that back as a new issue.

Roland Reis recapped the purpose of the proposed change.

Ed Barranco clarified the rule and statutory basis for the incorporation of voluntary inspection guidelines. The industry developed the procedures and when it was promulgated, there was not a specific violation or disciplinary standard incorporated.

Sonia Cruz made a MOTION to APPROVE

There was no second. MOTION FAILED

Ron Davenport made a MOTION to TABLE for more clarity.
Seconded by Martin Guffey
MOTION PASSED with one descent (Sonia Cruz)

5. OTHER ITEMS OF INTEREST TO THE TECHNICAL REVIEW AND ADVISORY PANEL

None

6. PUBLIC COMMENT

Members of the public were heard throughout the meeting. No additional public comment was offered.

Roy Pence made a MOTION to ADJOURN
Seconded by Ron Davenport

Meeting Adjourned at 1:50 PM.

15-02 ISSUE FOR TECHNICAL REVIEW AND ADVISORY PANEL CONSIDERATION

Printed 8/22/2016 7:10:20 AM

Next Trap Meeting:

Subject: Nitrogen-Reducing Media Lined Drainfields

Rule Sections: 64E-6.009

Issue:	The Passive Nitrogen Study provided at least one system that is simple enough and reliable enough to allow incorporation into the prescriptive portion of the rule. This is the most simple of them.
Issue Originated By:	Tom Frick, DEP
Purpose and Effect	The proposed changes allow owners to opt to install engineer-designed nitrogen-reducing media layers under the conventional drainfield and provides the prescriptive requirements for such an installation.
Proposed Rule Change:	15-02--64E-6.009 Nitrogen-reducing media layer.doc (See Attached)
Summary:	Provides for engineer-designed nitrogen-reducing liner beneath a conventional drainfield.
Possible Financial Impacts:	The installation of the media will be an expense in addition to the conventional system. If embraced by the BMAP or mitigation requirements, this is a lower cost alternative to other performance-based nitrogen-reduction systems and requires no operating permit or maintenance contract.
Date New:	8/27/2015
Initially Reviewed by Trap:	10/22/2015
Tabled by Trap:	10/22/2015
Trap Review Finished:	
Variance Committee Reviewed:	
Trap Review Variance Comments:	
Trap Final Decision:	
Final Outcome:	
Comments:	10/22/2016 TRAP tabled for additional information. DH 3/16/2016 Made amendments to incorporate ideas received re-non-engineers, replacing media, media example, subsequent collection and drainfield. DH 5/14/2016 Incorporated ideas related to soil textures and improving effluent affinity to treatment media. DH 8/8/2016 Incorporated staff comments and addressed sampling and mounding issue.
Ready for Rule	☐
In Rule	☐

Rule Date:

64E-6.009 Alternative Systems.

When approved by the DOH county health department, alternative systems may, at the discretion of the applicant, be utilized in circumstances where standard subsurface systems are not suitable or where alternative systems are more feasible. Unless otherwise noted, all rules pertaining to siting, construction, and maintenance of standard subsurface systems shall apply to alternative systems. In addition, the DOH county health department may, using the criteria in subsection 64E-6.004(4), F.A.C., require the submission of plans prepared by an engineer licensed in the State of Florida, prior to considering the use of any alternative system.

(1) through (6) No change

(7) Nitrogen-reducing media layers –Nitrogen-reducing media layers may be placed beneath the drainfield provided the resulting system meets all requirements in this chapter except as noted in this subsection.

(a) The system drainfield shall be low-pressure dosed.

(a) The first 100 systems installed under this subsection shall be designed by an engineer licensed by the state of Florida. Subsequent systems shall be designed by an engineer, licensed by the State of Florida, or, if not precluded by Rule 64E-6.004(4), by a master septic tank contractor. The master septic tank contractor shall have successfully passed a department-approved course in the installation of alternative nitrogen-reducing systems and have installed at least 20 of these systems that were designed by an engineer.

(b) The natural and existing soil profile throughout the area of the drainfield shall indicate slightly-limited soils extending from the ground surface to no less than 6 inches below the bottom of the nitrogen-reducing media liner.

(c) The nitrogen-reducing media layer shall be no less than 12 inches thick.

(d) The media layer shall be enclosed beneath and on the lower six inches of all sides by an impermeable liner composed of PVC, HDPE, or EPDM having a thickness of at least at least 30 mils and being certified by the manufacturer for a minimum lifetime of 30 years buried.

(e) No portion of the liner or nitrogen–reducing media shall be within 18 inches of the bottom of the drainfield. For repairs, a 12-inch separation may be permitted between the bottom of the drainfield and the nitrogen-reducing media.

(f) The lowest point of the liner shall be no less than 6 inches above the water table at the wettest season of the year.

(g) The nitrogen-reducing media layer shall extend beneath the entire drainfield absorption surface and extend at least 3.5 feet beyond the perimeter of any portion of the drainfield absorption surface and any other effluent release point. For repairs, the 3.5 feet dimension may be reduced to 1.0 feet if necessary to comply with a setback or if physical room is unavailable. No part of the liner shall be placed within 18 inches of the pump or treatment tank.

(h) An example of nitrogen-reducing media is lignocellulosic material such as chips or shavings of untreated lumber or blended urban waste wood. The nutrient-reducing media shall have been demonstrated in Florida-based studies to be effective at providing a substrate for denitrification.

(i) The nitrogen-reducing media shall comply with the provisions of 64E-6.0151, FAC.

(j) The soil layer between the bottom of the drainfield and the nitrogen-reducing media shall consist of fine aggregate having a texture of sand or fine sand but excluding:

1. those having color values less than or equal to 4 with chromas less than or equal to 3; or

2. those with colors on the gley charts.

(k) The nitrogen-reducing media shall be mixed at a ratio between 1 and 9 parts media to 1 part fine aggregate by volume. The fine aggregate to be mixed with the media shall be one of the following textures: coarse sandy loam, sandy loam, loamy sand, fine sandy loam, very fine sand, loamy fine sand, and loamy very fine sand; and shall conform to the colors in subparagraph (j) above.

(l) The department shall not require sampling although sampling may be required by the designer, municipality or other state agency as necessary to comply with applicable regulatory requirements.

(m) Where the system has a total required drainfield size over 1500 square feet, the design engineer shall address the potential for mounding of the effluent between the drainfield and the liner at the estimated sewage flow and will increase the separation between the drainfield and the media to ensure no less than 18 inches of unsaturated soil beneath the drainfield. A four-inch diameter observation port shall be installed in the center of the liner to allow the liquid level of effluent contained within the bottom of the media liner to be monitored. The observation port shall be capped and lockable and installed within a protective surface cover. If installed within three feet of the sidewall of a bed or trench, the port shall be grouted to prevent effluent from flowing down the outer surface of the port to the media.

(n) The perimeter of the liner, in feet, multiplied by the perimeter loading rate shall not be less than the estimated daily sewage flow for the system. The most restrictive soil texture between the elevation of the bottom of the drainfield and the elevation six inches below the bottom of the liner throughout the area of the installation and 24 inches beyond the perimeter of the liner shall be used to determine the nitrogen-reducing media perimeter loading rate.

Soil Texture	Perimeter Loading Rate (gal/ft/day)
coarse sand not associated with a seasonal water table of less than 48 inches; sands; and loamy coarse sand	10

fine sand	7
loamy sands; coarse sandy loam; and sandy loam	3

(o) The designer shall observe the complete installation of the liner and media and shall provide an as-built drawing including a cross-section and map view of the system and a written certification to the department that the entire installation meets the requirements of the permit and this chapter.

(p) The designer, if an engineer, may alter the media mix ratios, specify additional layers, or add liners to enhance treatment and effluent routing provided they do not:

1. reduce to less than 24 inches the vertical effluent travel path through unsaturated soil from the bottom of the drainfield to the seasonal high water table;

2. reduce to less than 18 inches the vertical effluent travel path through unsaturated soil from the bottom of the drainfield to the nitrogen-reducing media layer;

3. provide a route for effluent to bypass the nitrogen-reducing media;

4. reduce the average effluent contact time with the nitrogen-reducing media; or

5. cause a violation of 64E-6.0151, FAC.

(q) The designer, if an engineer, shall specify methods to replenish media and remove spent media if the continued presence of such spent media appreciably reduces the efficacy of the process provided the methods do not compromise the efficacy of the system in a manner listed in (p)1. through 5. above.

(r) Any seams or penetrations through the liner shall be sealed in accordance with the liner manufacturer's instructions to prevent leakage for the life of the liner.

(s) Provided the effluent has passed vertically without pressure through at least 24 inches of unsaturated soil, the designer, if an engineer, may specify the collection of the effluent and distribution to an absorption drainfield that is separated from the seasonal high water table by no less than least 6 inches and may be more than 30 inches below the ground surface. Minimum pitch from previous components shall be used to maintain distribution as high as possible above the seasonal high water table.

(8) through (10) Renumber as (9) through (11) No change

Rulemaking Authority 381.0065(3)(a) FS. Law Implemented 381.0065 FS. History–New 12-22-82, Amended 2-5-85, Formerly 10D-6.49, Amended 3-17-92, 1-3-95, Formerly 10D-6.049, Amended 11-19-97, 2-3-98, 3-22-00, 4-21-02, 6-18-03, 11-26-06, 6-25-09,_____.

16-01 ISSUE FOR TECHNICAL REVIEW AND ADVISORY PANEL CONSIDERATION

Printed 8/22/2016 7:11:26 AM

Next Trap Meeting:

Subject: Drip Emitter System Slope

Rule Sections: 64E-6.009(5)(a)

Issue:	In the absence of specific language addressing the maximum permissabole slope for drip emitter lines, the standard "level to 1 inch per 10 feet" could apply. This is not an appropriate restriction for the pumped emitter system and certainly is not necessary for pressure-compensating emitters. This issue seeks to remedy that by creating sub-paragraph 27. and also cleans up some minor language issues in sub-paragraph 20. and 26.
Issue Originated By:	Scott Franz, Soil Scientist
Purpose and Effect	The proposed changes provide a broader range of allowable slopes based on the manufacturer's recommendations differentiating between the type of emitter being used in the installation. May provide an alternative to drop boxes for sloping lots.
Proposed Rule Change:	16-01--64E-6.009 Drip Emitter System Levelness.doc (See Attached)
Summary:	This proposal eases the requirements for drain line slope for drip emitter systems.
Possible Financial Impacts:	As the proposal eases the requirements, the financial impact should either be none or possibly provide a lower cost or more desireable alternative on sloping lots.
Date New:	2/11/2016
Initially Reviewed by Trap:	
Tabled by Trap:	
Trap Review Finished:	
Variance Committee Reviewed:	
Trap Review Variance Comments:	
Trap Final Decision:	
Final Outcome:	
Comments:	
Ready for Rule	☐
In Rule	☐
Rule Date:	

64E-6.009 Alternative Systems.

(1) through (4) No change

(5) Drip irrigation systems – Drip irrigation systems may, at the option of the applicant, be used in lieu of a mineral aggregate drainfield. Drip irrigation systems shall meet all requirements of this chapter except as noted below.

(a) Drip irrigation systems shall receive effluent from an approved aerobic treatment unit or a performance-based treatment system designed to meet at least secondary treatment standards for $CBOD_5$ and TSS, and shall meet the following requirements:

1. through 19. No change

20. All onsite sewage treatment and disposal systems that include a drip effluent disposal system and aerobic treatment unit or performance-based treatment system shall have a biennial operating permit, a maintenance contract with an approved ~~aerobic treatment system~~ maintenance entity, and shall be inspected in accordance with the requirements of this chapter.

21. through 25. No change

26. Except for slopes required to meet the stabilization requirements of paragraph 64E-6.009(3)(f), F.A.C., the area over the drip irrigation drainfield shall be stabilized in the same way or vegetated with plant species specified by the design engineer. The species specified shall not include trees.

27. For drip emitter lines using non-pressure-compensating emitters, the maximum elevation difference shall be four inches between the highest and the lowest emitter in any individual line segment between the supply and the return line. For drip emitter lines using pressure-compensating emitters, there shall be no more than 18 inches of elevation difference between the highest and lowest emitter in any line. When the slope in the drainfield area exceeds 10 percent, the designer shall identify the means by which drainage from the various system components will be prevented from flowing to the lowest area of the zone. Neither property slope nor drip emitter line slope shall result in the depth of cover over the drip emitter lines to be outside of the range permitted in 64E-6.009(5)(a)19.

EARLIER PROPOSAL:

~~27. Where possible, drip emitter line segments between supply and return lines shall be designed and installed roughly level. Where the slope of the lot dictates otherwise, for non-pressure-compensating emitters, a maximum difference of four inches between the highest and lowest emitter in any line is allowed. For pressure-compensating emitters, a maximum difference of 18 inches between highest and lowest emitter in any line shall is allowed. When the slope of the drainfield exceeds 10 percent, the designer shall identify the means to minimize a disproportionate amount of drainage into the lowest area of the zone.~~

(b) No change

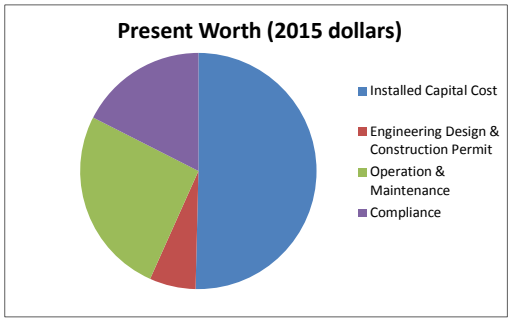
(6) through (10) No change

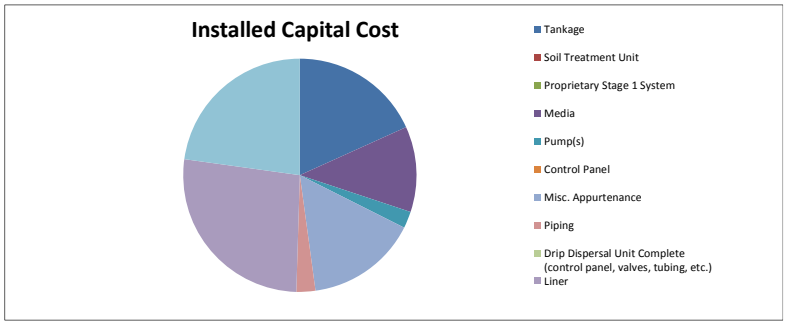
Rulemaking Authority 381.0065(3)(a) FS. Law Implemented 381.0065 FS. History–New 12-22-82, Amended 2-5-85, Formerly 10D-6.49, Amended 3-17-92, 1-3-95, Formerly 10D-6.049, Amended 11-19-97, 2-3-98, 3-22-00, 4-21-02, 6-18-03, 11-26-06, 6-25-09,_____.

PNRS LCCA: Life Cycle Cost Analysis Tool for Passive Nitrogen Reduction Systems
LCCA Identification: BHS-7

Worksheet

9. LCCA Total System





Conventional System Summary

No. of Bedrooms	3
Building area, square feet	1800
Depth to seasonal high water table (inches)	72
New OSTDS installation or retrofit of existing system	new
Design wastewater flow, gallon/day	300

User override Conventional costs have been specified

PNRS System Summary

PNRS System	17
Stage 1: PNRS or proprietary	PNRS
PNRS Stage(s)	Stage 1&2
Stage 1 in-tank or in-ground	In-ground
Stage 1 single pass or recirculation	Single pass
Stage 1 media type	Native Sand
Ligno disposition	Underlying Stage 1 in-ground liner
Stage 2 media type	Ligno only
Construction Complexity	Simple
Level of nitrogen removal efficiency provided by system	Medium

No user override PNRS costs have been specified

Life Cycle Cost Calculations

Project Life (PL), years	30
Interest Rate (IR), %	2.000
Primary tank pump out interval (TI), years	5.0
Pump out analysis life (PL), years	25.0
Stage 2 media replacement interval (MI), years	15.0
Stage 2 media cost analysis life (ML), years	15.0
Equipment replacement interval (EI), years	10.0
Equipment replacement analysis life (EL), years	20.0
Compound Interest Factors	
P/A PL/IR	22.396
A/P PL/IR	0.04465
A/F TI	0.19216
P/A PL	19.523
A/F MI	0.05783
P/A ML	12.849
A/F EI	0.09133
P/A EL	16.351
Nitrogen Removal	
Mass loading/year, lbs.	27.0
Removal efficiency, %	60.0
Mass removal/year, lbs.	16.21

Life Cycle Cost

Cost Item	Present Worth, $	Uniform Annual Cost, $	% of Total Life Cycle Cost
Conventional System Installation			
Primary treatment tank	1,400.00	62.51	6.4
Pump tank	600.00	26.79	2.8
Conventional system pump	250.00	11.16	1.1
Soil treatment unit	0.00	0.00	0.0
Subtotal Conventional	2,250.00	100.46	10.3
Proprietary Stage 1 system	0.00	0.00	0.0
PNRS Installation			
Tankage	0.00	0.00	0.0
Media	1,301.25	58.10	6.0
PNRS Pump	0.00	0.00	0.0
Control Panel	0.00	0.00	0.0
Piping	289.60	12.93	1.3
Misc. Appurtenance	1,693.00	75.59	7.8
Stage 1 Drip Dispersal System Complete (control panel, valves, tubing, etc.)	0.00	0.00	0.0
Liner	2,925.00	130.60	13.4
Contractor Fee	2,500.00	111.62	11.5
Subtotal	8,708.85	388.85	40.0
Total System Installation	10,958.85	489.31	50.4
Engineering Design & Construction Permit			
Construction permit	375.00	16.74	1.7
Engineering design fees	1,000.00	44.65	4.6
Operation and Maintenance			
Annual energy cost	191.49	8.55	0.9
Annual inspection & maintenance	4,479.29	200.00	20.6
Primary tank pump out	937.90	41.88	4.3
Stage 2 media replacement	0.00	0.00	0.0
Equipment replacement	0.00	0.00	0.0
Subtotal	5,608.68	250.43	25.8
Compliance			
Operating permit fee	1,119.82	50.00	5.1
Water quality monitoring	2,687.57	120.00	12.4
Subtotal	3,807.40	170.00	17.5
Total	21,749.93	971.13	100.00

Installed Capital Cost

Installation	Cost Item	Present Worth, $	Uniform Annual Cost, $	% of Installation Cost
Tankage		2,000.00	89.30	18.3
Soil Treatment Unit		0.00	0.00	0.0
Proprietary Stage 1 System		0.00	0.00	0.0
Media		1,301.25	58.10	11.9
Pump(s)		250.00	11.16	2.3
Control Panel		0.00	0.00	0.0
Misc. Appurtenance		1,693.00	75.59	15.4
Piping		289.60	12.93	2.6
Drip Dispersal Unit Complete (control panel, valves, tubing, etc.)		0.00	0.00	0.0
Liner		2,925.00	130.60	26.7
Contractor Fee		2,500.00	111.62	22.8
Total System		10,958.85	489.31	100.0

Life Cycle Cost

Cost Item	Present Worth, $	Uniform Annual Cost, $	% of Total Life Cycle Cost
Installed Capital Cost	10,958.85	489.31	50.4
Engineering Design & Construction Permit	1,375.00	61.39	6.3
Operation & Maintenance	5,608.68	250.43	25.8
Compliance	3,807.40	170.00	17.5
Total	21,749.93	971.13	100.0
$/lb nitrogen removed	44.73	59.92	

Developed by: HAZEN AND SAWYER Environmental Engineers & Scientists **and** AET

Cost Proposal Elements

Please provide your cost proposal in the following format:

Modification Permit Fee $ 500

Drainfield, piping, diverter (materials) $ 6750.00

Excavation and installation (based on 4 hour estimate) $ 1000.00

Additional hours if required ($ 250 /hr)

Recycled hardwood mulch, including delivery (based on 48 / cu yds) $ 720.00

Additional cu yd, delivered ($ 15 /cu yd)

30 mil (or greater) PVC or polyethylene liner (based on 1344 sq ft) $ 1800.00

Larger size liner needed ($ 2 / sq ft) must be custom made

Site restoration and seeding (based 2 hour estimate) $ 500.00

Additional hours if required ($ 250 /hr)

Other costs (Explain: Clean fill if needed $300 per load $ —

Other potential costs (Explain $1800 for 6 loads of fill if needed

ESTIMATED TOTAL COST $ 11270.00

Shelley's Septic Tanks, Inc.

P.O. Box 249
Zellwood, FL 32798
(407) 889-8042
Lake Co. Residents (352) 383-5775

Invoice

DATE	INVOICE #
7/29/2016	139853

Bill To:

FDEP Ground Water Mgt. Section
2600 Blair Stone Rd, MS 3575
Tallahassee, FL 32399-2400
Attn: Richard Hicks

Service Address:

Wekiva River Basin
Septic study
1914 Orchard Dr.
Apopka, Fl. 32712

P.O. NO.	TERMS	DUE DATE	PERMIT NO.
		7/29/2016	16-0935

QUANTI...	DESCRIPTION	RATE	SERVICED	AMOUNT
	Modification Permit Fee	500.00		500.00
8	Site Work - Excavation (4 hours in estimate + 4 additional)	250.00		2,000.00
	Install 30 mil liner as required	1,800.00		1,800.00
8	Site Work - Hours additional to install liner due to depth and weather	250.00		2,000.00
54	Yards of hardwood mulch	15.00		810.00
	Installed 432B square foot drain field in infiltrators.	4,320.00		4,320.00
	State Sales Tax	6.50%		0.00

Thank You. We Appreciate Your Business!

Total $11,430.00

NEW REMIT TO ADDRESS:
PO BOX 1209
WINTER PARK, FL 32790

Construction Summary: Assessment of the Nitrogen Removal and Viability of a Reactive Layer with Liner under a Conventional Septic System Drainfield

Division of Environmental Assessment and Restoration

Florida Department of Environmental Protection

August 2016

2600 Blair Stone Road, MS 3575
Tallahassee, Florida 32399-2400
www.dep.state.fl.us

Prepared by:

Florida Department of Environmental Protection

Division of Environmental Assessment and Restoration

Water Quality Evaluation and TMDL Program

Groundwater Management Section

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DEP Groundwater Management Section

850-245-8229

richard.w.hicks@dep.state.fl.us

Introduction

Construction of the experimental drainfield at 1914 Orchard Drive in Apopka was completed during the week of July 18, 2016. Site restoration and installation of the monitoring devices occurred the following week. This summary provides information on the construction activities and challenges as well as specifics on measurements and any deviations from the construction and monitoring plan. In general, only minor deviations from the original design occurred. The experimental drainfield was put on line on July 29, 2016.

Experimental Design

This experimental drainfield was constructed as designed for the most part. Construction activities, actual dimensions and deviations are described below. **Figure 1** shows the site layout. **Figures 2, 3** and **4** show the actual dimensions and depths of components as installed. **Figures 5** and **6** show the actual locations and depths of the monitoring components. **Table 1** provides summary information on the construction depths and relative elevations of system components and monitoring devices. Photographs in **Appendix A** document the stages of construction and methods used for installation.

- This design was constructed using a conventional gravity flow drainfield system consisting of a bed of infiltration chambers. The actual drainfield footprint was 9 feet by 36 feet instead of 10 by 36 feet, which resulted in a wider than anticipated margin between the drainfield edge and the edge of the liner.
- The drainfield was underlain by 19 to 20 inch thickness of native sand.
- A 13 to 14-inch thickness of recycled wood mulch was installed. After compaction, the thickness of the wood mulch layer may be closer to 10 inches in thickness. The recycled wood mulch consisted of 4 inch or finer shredded hardwood obtained from Raynor Shine Wood Mulch Products in Apopka.
- A 30 mil reinforced polyethylene liner was installed on a level surface before the mulch was emplaced. Leveling of the bottom was done by hand with use of a laser level and

carpenter's level. The liner was manufactured by GEI Works for ponds and lagoons. Sand was installed by hand along the outside edge of the liner to create a sloped berm around the margins of the liner. A level and tape were used to make certain that the edge of the liner on the berm was consistently 6 inches about the bottom. Water percolating through the sand and wood mulch will collect on the liner to create a saturated zone of 6 inches within the mulch, flow over the edge of the plastic sheeting, and continue to seep downward.

- Monitoring devices were installed to measure water quality in the effluent, infiltrating effluent above the mulch layer, water residing within the saturated zone on top of the liner, infiltrating treated water along the liner edges, and shallow ground water immediately adjacent to the experimental drainfield. Water levels will be measured to monitor mounding within the mulch layer and flow to the system will be measured with a flow meter installed on the water supply line to the residence.

Installation Steps

The installation of the experimental drainfield and monitoring system occurred during the weeks of July 18 and 25. Construction took 5 days, followed by 2 days of work to install monitoring devices and 1.5 days of site restoration. **Table A1** in **Appendix A** provides a timeline of the construction project, instrumentation for monitoring and site restoration.

The following activities occurred in the construction and set up of the experimental drainfield:

1-Preparing the Septic Tank Outlet and Installation of Flow Diversion: Shelley's Septic Tanks was the contractor who installed the system. The contractor exposed the top and outlet end of the septic tank to install new piping to connect the septic tank to both the in-use drainfield and the experimental drainfield. Two knife valves were installed side by side at the septic tank outlet end to divert flow. These were both enclosed in a 2-foot-diameter riser with domed lid. In addition, the contractor replaced a section of the septic tank lid which showed signs of deterioration and installed a riser on top of the new lid at the tank outlet end. The tank outlet was used as an elevation reference for all of the experimental drainfield

components. The bottom of the tank outlet was approximately 3 feet (36 inches) below land surface in the tank area.

2-Excavation of Pit and Leveling: The contractor used a Case 580 Series backhoe loader to excavate the pit for installation of the liner, mulch, sand backfill, and drainfield and a mini trachoe to complete backfilling and leveling. Due to caving sands, the actual excavation dimensions exceeded the footprint of the 16 by 42 foot lined area by 3 to 4 feet on each side. Due to the depth of the septic tank outlet, which was approximately 3 feet below land surface, it was necessary to excavate the pit to a depth of approximately 7 feet. This required removal and management of approximately 300 cubic yards of material from the pit area. To manage the amount of stockpiled material and allow access of the equipment for mulch installation and backfilling, the excavation of the pit, installation of the liner and installation of the mulch occurred in stages.

3-Liner Installation: The liner was installed in three stages and met the construction specifications for width and length and uniform depth below the reference elevation. At completion, the bottom of the lined area was 16 by 42 feet. To allow it to be installed in stages, the liner was first unfolded and spread out on an obstruction-free area, properly oriented to be installed, then rolled up so that it could be put in the pit and unrolled as construction proceeded. Installation proceeded from the header end, with liner installed beneath the area to be covered by the header. It was emplaced on the smoothed and leveled bottom of the pit so that at least 3 feet of liner extended beyond the anticipated edge of the drainfield in all four directions. The edges of the liner were turned up on a sloped berm of sand to create a uniform 6 inch depth of the reservoir. The liner bottom is approximately 75 inches (6.8 feet) below land surface, which is 39 inches (3.3 feet) below the septic tank outlet.

4-Mulch Layer Installation: The contractor obtained approximately 27 cubic yards of wood mulch from Raynor Shine and stockpiled it for installation after the liner was prepared. The installation of the mulch was preceded by the installation of clean backfill on top of the liner at the header end. At the header end, the sand layer extended to the edge of the drainfield. The installation of the mulch then proceeded. Marked stakes inserted in the mulch area on top of the liner were used to maintain a uniform thickness of mulch as it was

installed, compacted by walking on it, and leveled. The edge of the mulch layer was kept within the level portion of the lined area. The thickness of the mulch at installation ranged from 13 to 14 inches (1.1 feet), as the surface of the mulch was irregular.

5-Backfilled Sand Layer Installation: Clean sand from the stockpile was installed on top of the mulch layer after it was installed. Sand was installed to an average thickness of 19 inches (1.6 feet). Sand installed directly on the liner at the header end of the drainfield was packed down and built up to support the header. After setting the header, the sand layer was then smoothed and sloped to achieve the necessary fall from the header as the rows of infiltrators were installed.

6-Drainfield Installation: The drainfield was constructed of 4 rows of infiltration chambers that were spaced approximately 6 inches apart. This drainfield is 9 feet wide by approximately 36 feet long and has 432 square feet of infiltrative surface. The drainfield was constructed of Infiltrator Quick 4 EQ36™ infiltration chambers that were covered by fabric prior to burial. The drainfield was oriented on top of the lined area so that a minimum of 3 feet of lined margin extended on all sides. Actual margin ranged from 3 feet 4 inches to 5 feet because the drainfield was 1 foot narrower than the design and had to be articulated slightly to accommodate piezometers that were installed earlier. The edge of the liner was marked by wooden stakes and PVC pipes that were placed to help locate the position of deep lysimeters to be installed after construction.

7-Monitoring Device Installation: The monitoring devices installed during the construction phase included 6 horizontal well points installed on top of the liner perpendicular to the long axis and 3 piezometers that were installed on top of the liner along the midline of the drainfield. After the construction, 6 deep lysimeters were installed along the edge of the liner, 6 shallow lysimeters were installed between the infiltration chambers to monitor infiltrating water above the mulch layer and 1 shallow lysimeter was installed beneath the header. In addition, a flow meter was installed on the water supply line from the well to measure flow of water to the house and drainfield (excluding the irrigation system). A monitoring well installed adjacent to the drainfield site prior to the construction activities will also be included in the monitoring plan. Depths of the monitoring devices were established using the bottom of the septic tank outlet as an elevation point of reference. **Table 1**

provides the monitoring device installation depths and bottom elevations relative to the experimental drainfield system components.

6-Site Restoration: After the drainfield was installed, the remaining open excavation was carefully backfilled and smoothed to the pre-existing grade. The combined area of the excavation site, soil and mulch stockpile areas and equipment turnaround areas was approximately 60 by 80 feet. This entire area was resodded after the site grading, removal of excess mulch and rubble, and installation of the monitoring devices.

Next Steps

DEP staff will return to the site after 1 month of system operation to collect samples and record measurements of flow and water levels in the piezometers and monitoring well. After three months of monitoring data are collected and analyzed, the first quarterly report will be submitted.

Figure 1. Study site with existing septic tank, old drainfield area, and experimental drainfield locations.

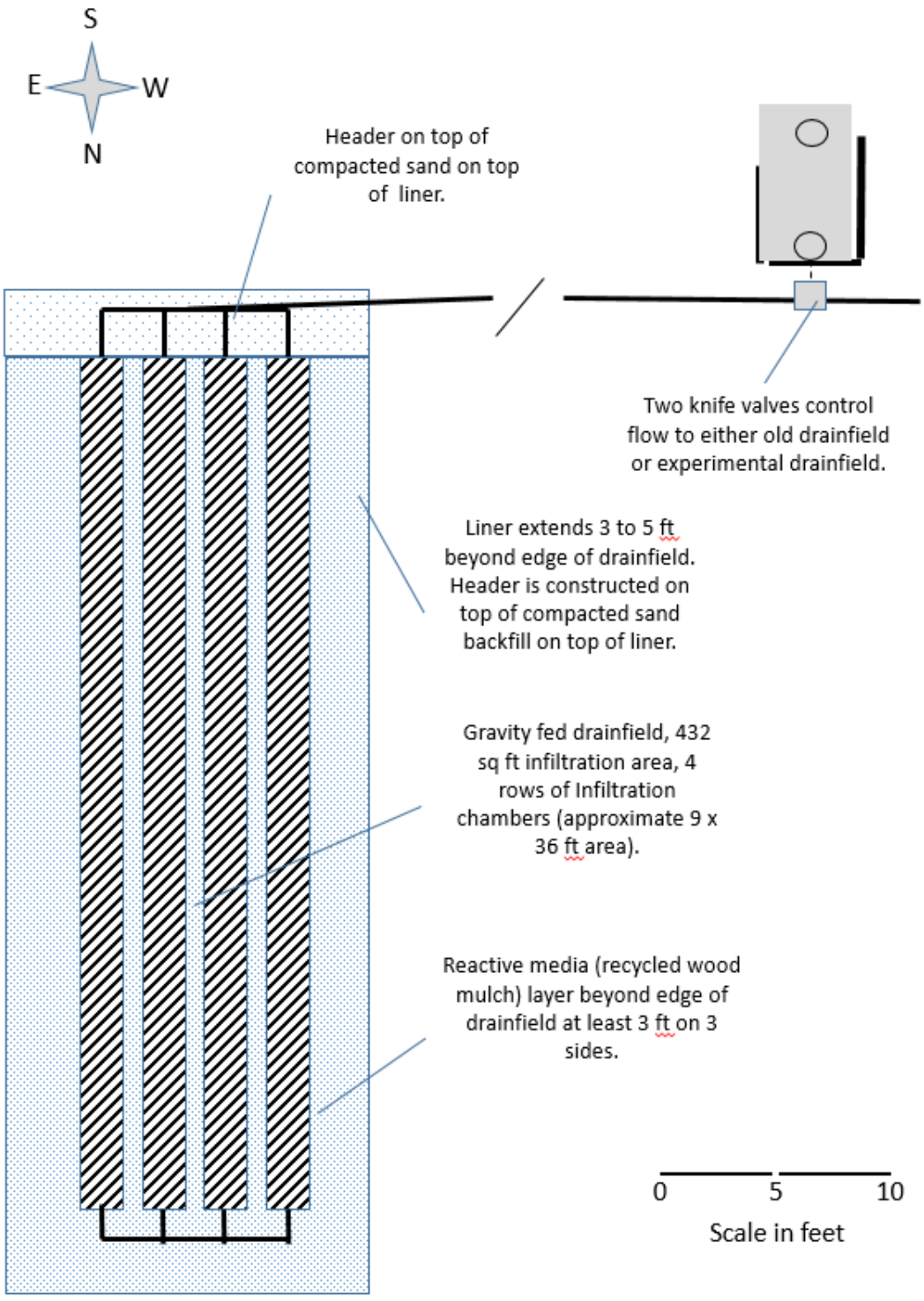


Figure 2. Plan view of experimental drainfield.

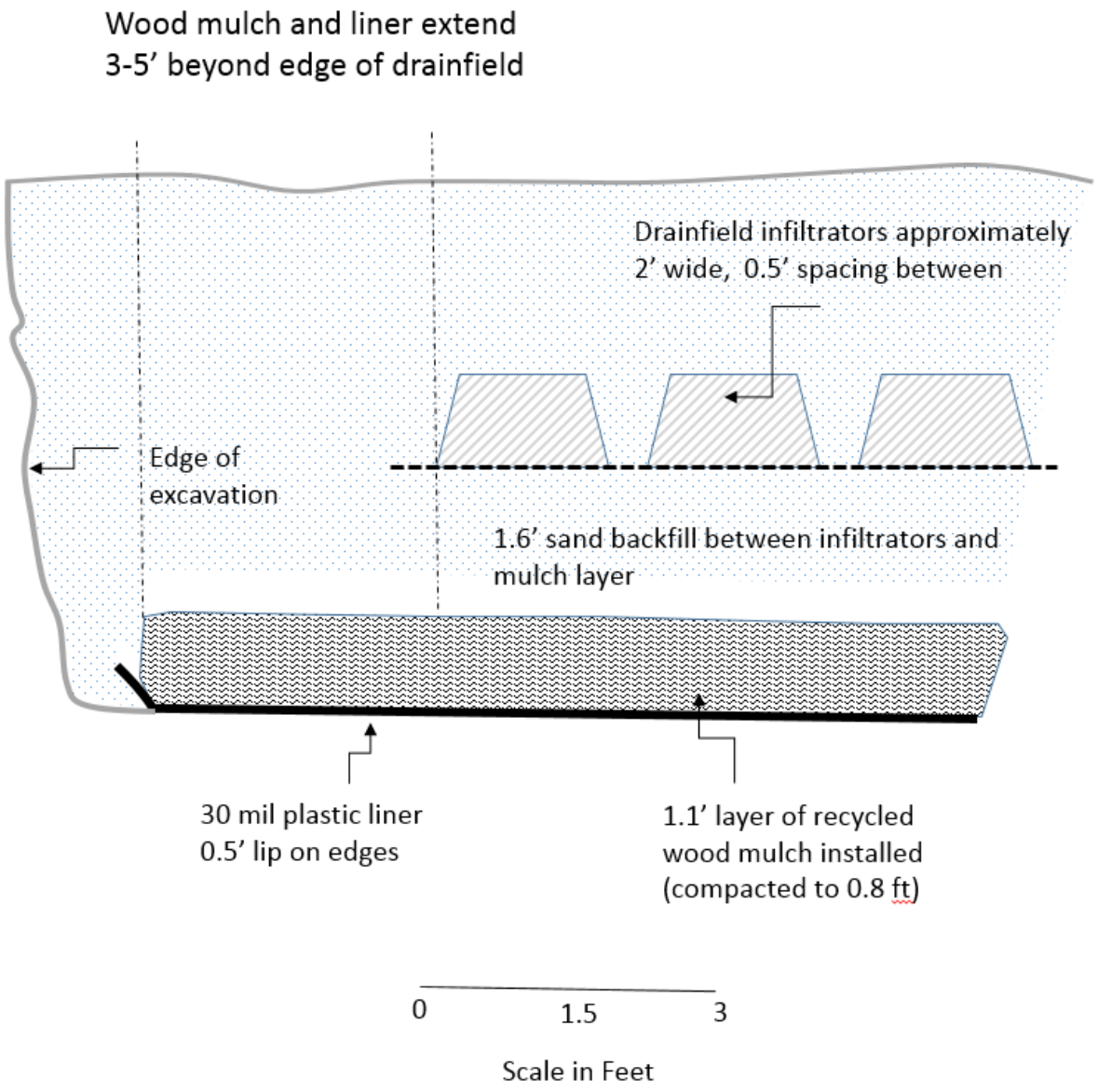


Figure 3. Cross sectional view of experimental drainfield.

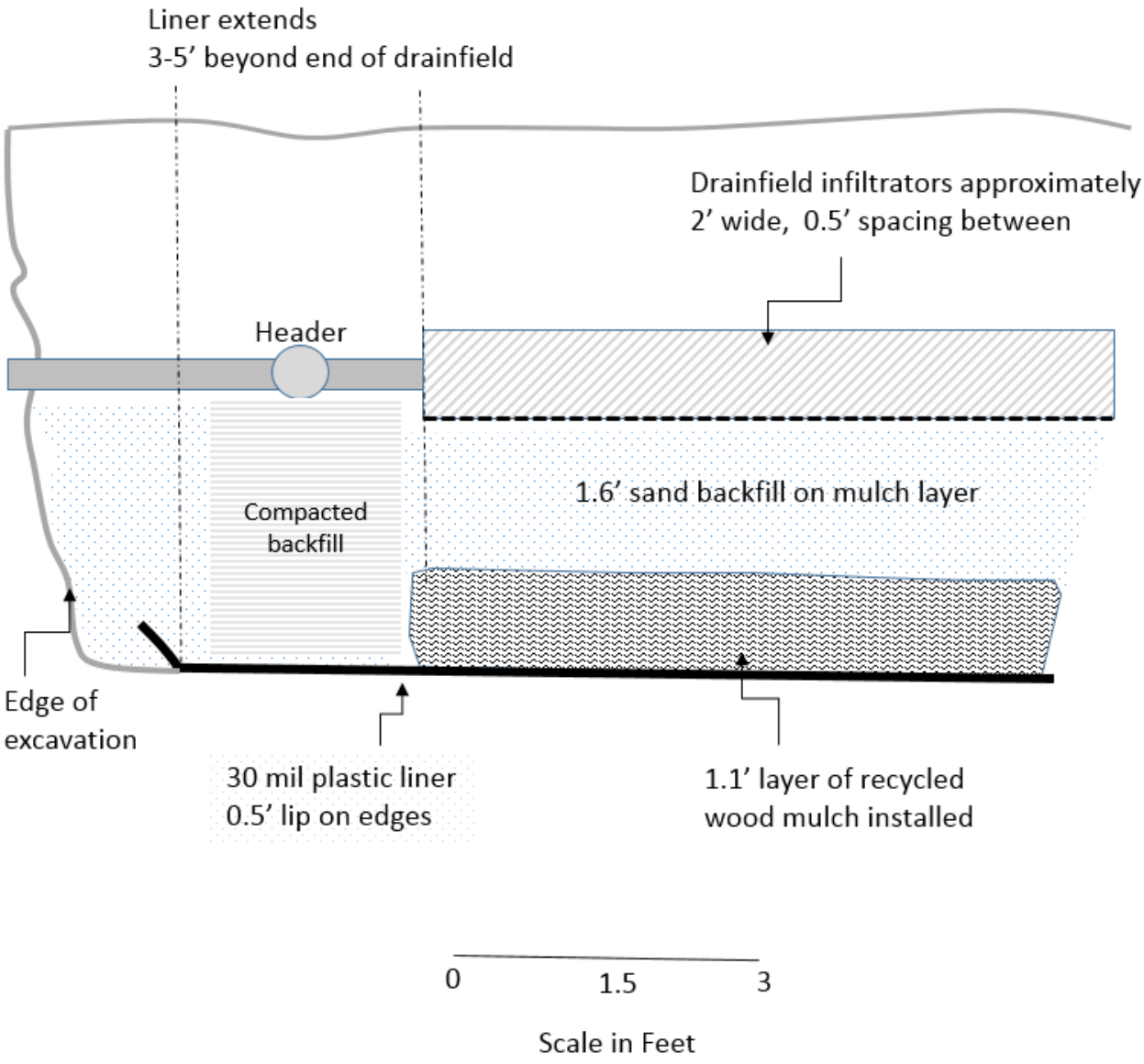


Figure 4. Cross sectional view of header area, experimental drainfield.

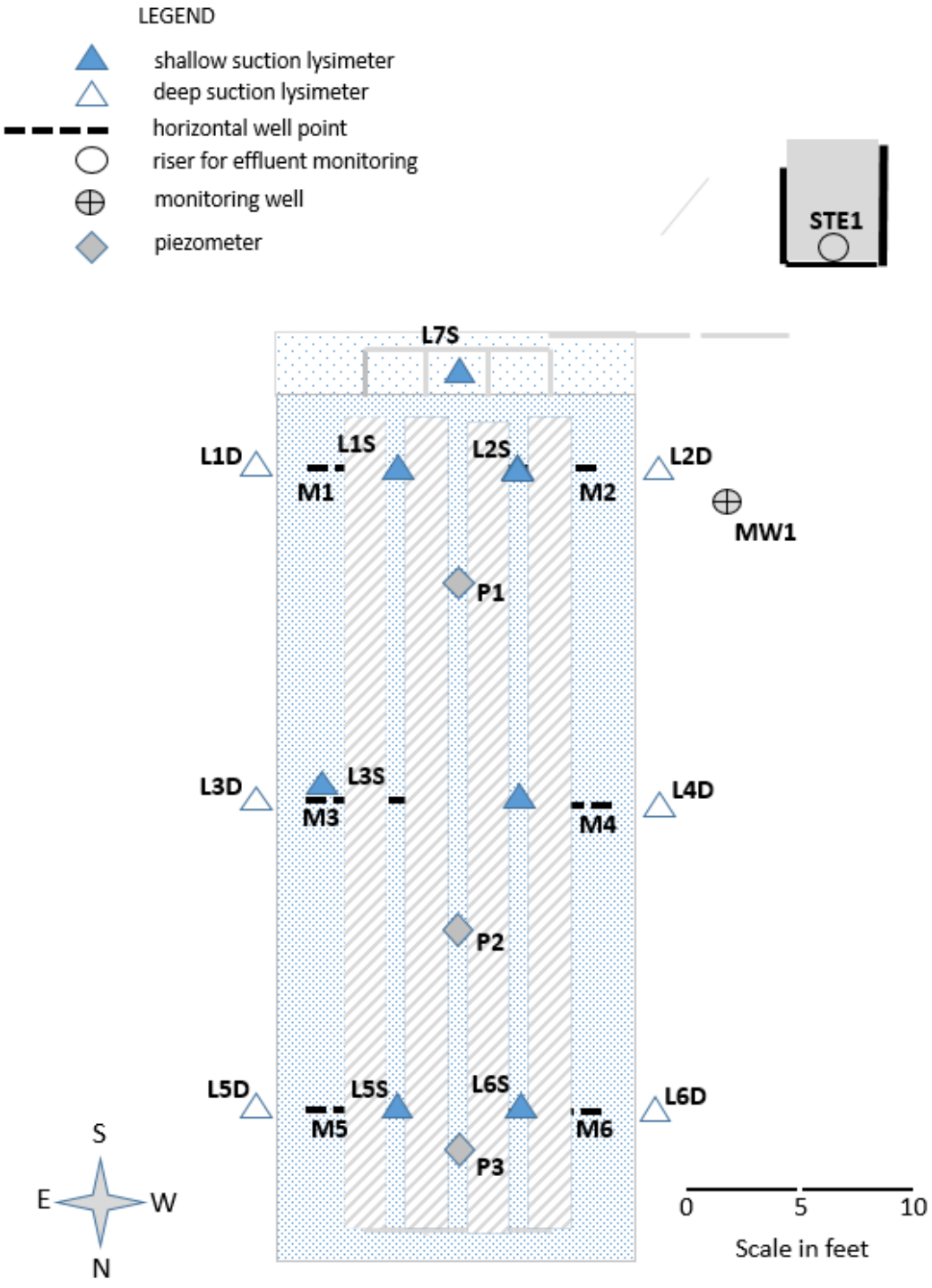


Figure 5. Plan view of monitoring locations at experimental drainfield.

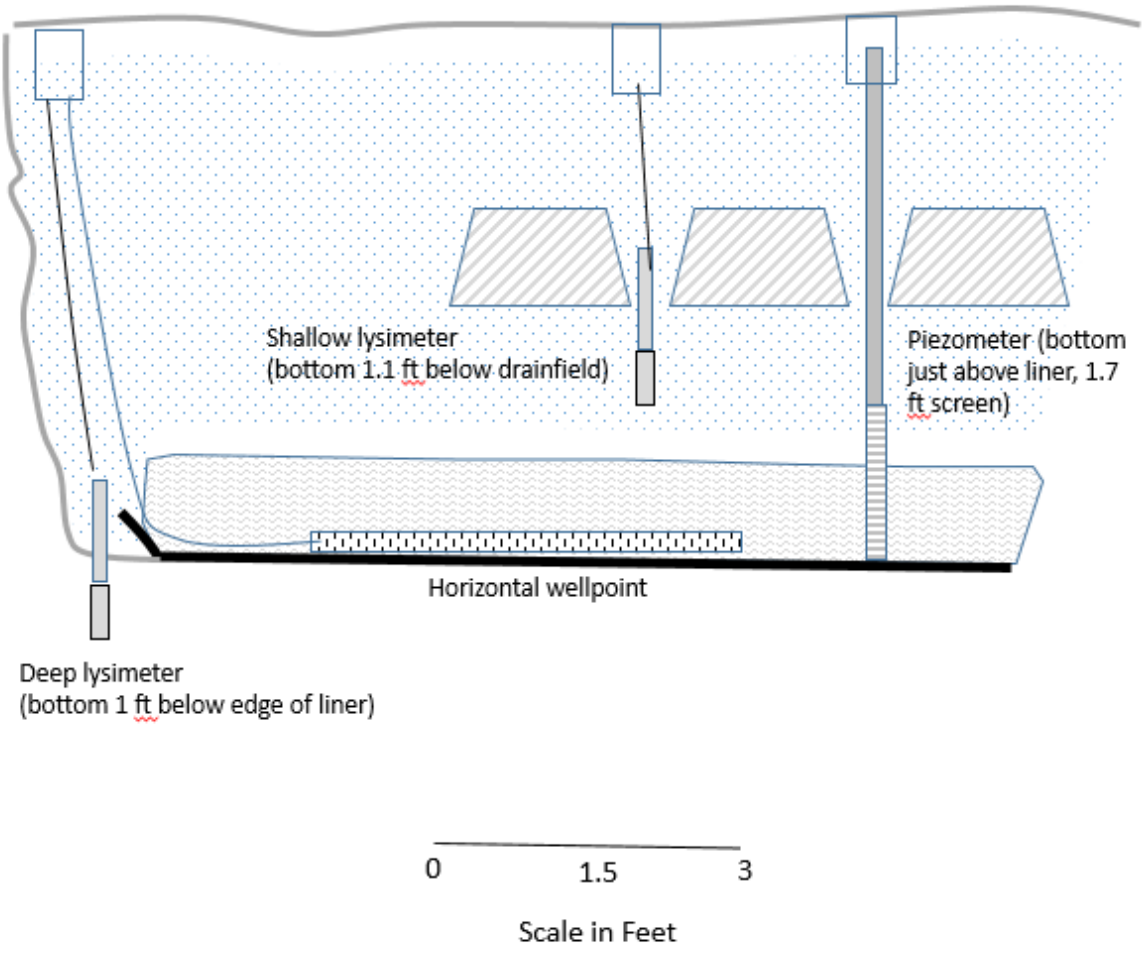


Figure 6. Cross section showing zones being monitored at experimental drainfield.

Table 1. Depths and Relative Elevations of Experimental Drainfield Components and Monitoring Devices

Point	Relative Elevation	Depth below land surface	Depth below outlet	Height above liner bottom	Height above liner edge
Average land surface at drainfield	103.5	0.0	-3.5	6.8	6.3
Septic tank outlet	100.0	3.5	0.0	3.3	2.8
Header	99.8	3.8	0.3	3.0	2.5
Infiltrator top	100.3	3.3	-0.3	3.5	3.0
Infiltrator base	99.3	4.3	0.8	2.5	2.0
Liner bottom	96.8	6.8	3.3	0.0	-0.5
Liner edge	97.3	6.3	2.8	0.5	0.0
Deep lysimeter bottom	96.2	7.3	3.8	-0.6	-1.1
Shallow lysimeter bottom	98.2	5.3	1.8	1.4	0.9
Horizontal well point mid	97.1	6.4	2.9	0.4	-0.1
P1 measuring point	102.7	0.8	-2.7	6.0	5.5
P1 bottom	97.0	6.6	3.1	0.2	-0.3
P2 measuring point	102.5	1.0	-2.5	5.8	5.3
P2 bottom	97.0	6.6	3.1	0.2	-0.3
P3 measuring point	102.4	1.1	-2.4	5.7	5.2
P3 bottom	97.0	6.6	3.1	0.2	-0.3
MW1 measuring point	102.5	1.0	-2.5	5.8	5.3
MW1 bottom	60.5	61.5	58.0	-54.8	-54.2

Notes: Depths and elevations in feet. Elevations are relative to septic tank outlet bottom, assigned elevation of 100.0 feet. Land surface based on average across drainfield area.

Table 2- Timeline of Site Activities

Date	Activity
July 18	Construct diversion to experimental drainfield and knife valves, replace damaged septic tank lid and install riser at effluent end of septic tank, stake out drainfield dimensions
July 19	Begin excavation, extend effluent pipe from septic tank to drainfield, install liner at header end, obtain mulch, move sand pile to get access to next segment of pit to excavate
July 20	After overnight rain event, repair excavation and pump out water accumulated on liner, install mulch on approximately 1/3 of liner, continue excavation and move accumulated soil pile to allow access to remaining area to excavate
Jul 21	Install sand in header area, complete excavation and install remaining liner and mulch in two stages, construct header
July 22	Complete mulch installation, install sand layer, install drainfield, obtain inspection, backfill remaining excavated area
July 25	Complete final grading of site and pick up
July 27-28	Install lysimeters
July 29	Install flow meter, re-sod construction area

APPENDIX A

Experimental Drainfield Construction Photographs

Drainfield area prior to construction. Jared and Kim from DOH.

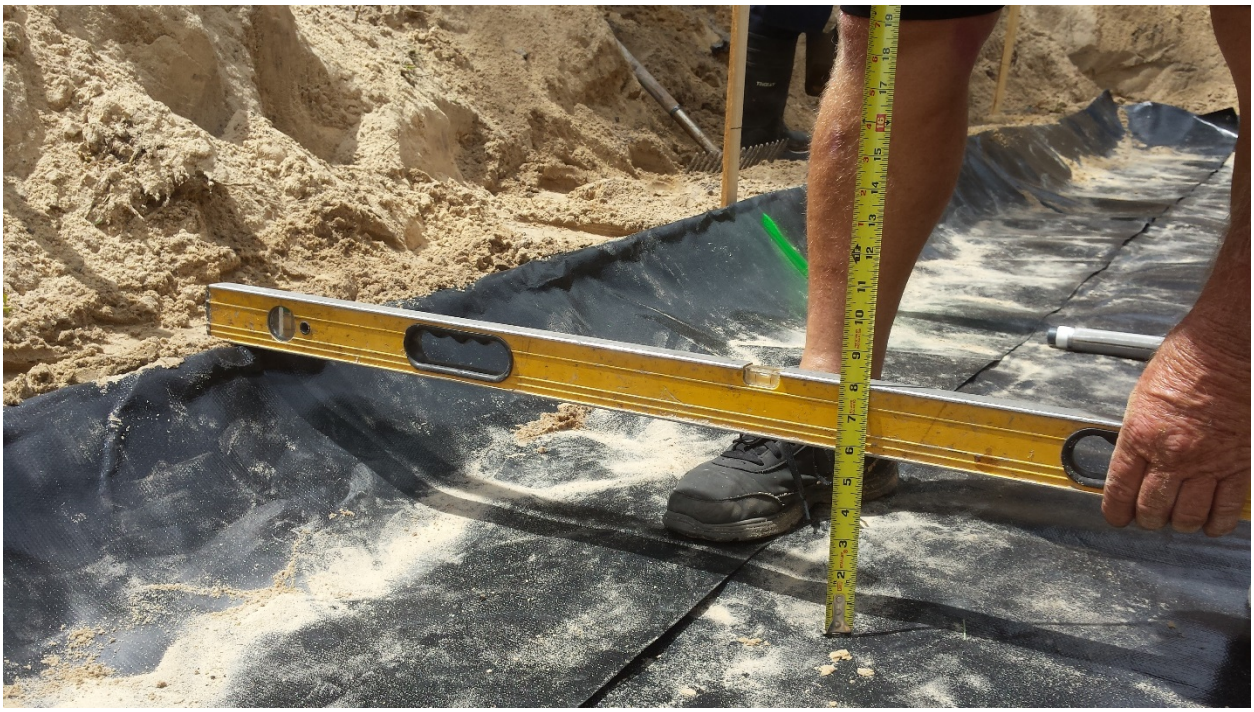
Knife valves and effluent sampling/inspection riser on septic tank. Green pipes are inspection ports to confirm flow direction.

Excavation of pit and leveling for liner installation

Liner installation, first stage

Impact from heavy rain event

Building up berm around edge of liner



Leveling to assure 6 inch depth

Horizontal wellpoint on liner

PVC pipe marking location for deep lysimeter, notch in liner to direct flow to lysimeter

Stockpiled shredded hardwood mulch

Mulch installation, second stage

Installing mulch adjacent to compacted sand for header, first stage

Completed mulch installation. Pipe is piezometer. Stakes used to assure uniform depth of mulch

Installing backfill on top of mulch, 19 to 20 inches thick

Header installation

Drainfield installation

Completed drainfield, piezometers between second and third rows. PVC pipes on edges mark edge of liner. Pipes between infiltrators are piezometers. Tubes go to horizontal wellpoints.

Fabric cover being installed over infiltrators

Covering drainfield after inspection, string marks edge of liner

Excavation filled prior to final grading

Edge of drainfield and material stockpile and equipment turning area, to be re-sodded

Installing lysimeters in graded drainfield area

Lysimeters installed in hand augered boreholes

Flow meter installed on supply line to house, next to water well. Irrigation line is separate.

Valve to experimental drainfield opened after flow meter installed

Total of 14 pallets of sod laid to restore damaged area

Site restored