Testimony In Support of LD 1550, Resolve Directing the Department of Health and Human Services to Amend Its Rules to Protect Water Quality by Reducing Nutrient Pollution from Septic Systems

Before the Joint Standing Committee on Health and Human Services

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Senator, Ingwersen, Representative Meyer, distinguished members of the Health and Human Services Committee, my name is David Rocque. I have been a Licensed Site Evaluator for 49 years and a Licensed Soil Scientist for nearly as long. I worked in the State Septic System program for 3 years as the State Site Evaluator where I licensed people to be Site Evaluators and investigated problem septic systems. I then moved into the position of State Soil Scientist with the Maine Soil and Water Conservation Commission which was dissolved in 1995 with its duties and functions, along with me, transferred to the Maine Department of Agriculture, Conservation and Forestry. I held that job for 33 years, until retirement in 2021. While employed as the State Site Evaluator, I would frequently find that septic system failures were due to contractor errors, mostly because they did not understand the ramifications of modifications they would use to save money for the homeowner. Many complained about the lack of training for contractors so they would better understand how to properly install a septic system. As a result of this unmet need, I began doing workshops aimed at providing contractors with this training. I continue to do them today, 5 years after I retired from State Government and have done two so far this year. As the State Soil Scientist, I was the soil expert for other State agencies, including DHHS, and private sector. I have written a number of sections in the Subsurface Wastewater Disposal Rules and continue having a working relationship with the State Septic System Program. Last summer, I helped set up the field exam for licensing Site Evaluators because the State Site Evaluator was on extended medical leave. I am frequently sought out by consulting firms, lake associations, municipalities and State Agencies because of my knowledge of septic systems and soils. As you can see, I have extensive knowledge regarding the subject of septic systems.

This resolve will address a concern I have had for many years. It is what I refer to as short circuiting septic systems which are septic systems that do little to attenuate nutrients in human wastewater before it reaches surface or groundwaters. Short circuiting septic systems are a threat to human health but also a significant environmental threat to lakes, ponds, streams, rivers and even the ocean. Septic systems installed in most Maine soil types do a pretty good job of removing nutrients from wastewater, but a few do not. The two most likely soil conditions for short circuiting are sandy/gravelly soils and shallow to bedrock soils. Nutrient attenuation in soils is accomplished primarily through biologic activity provided by microbes and plant roots utilizing them and cation exchange capacity. Cation exchange capacity is a measure of a soils ability to adsorb positively charge ions by negatively charged soil particles. Very small soil particles such as silt and clay are the primary carriers of negative charges. Sand and gravel have very little cation exchange capacity. Phosphorous, which is the limiting factor for algae blooms in lakes and rivers, is positively charged. So, if phosphorous comes in contact with a silt or clay particle, it will become attached to it and not travel into the groundwater table. If a septic system is installed in sand or gravel, where there are very few silt or clay particles and there is no biologic activity due to the lack of water or nutrients, it will travel unimpeded into the groundwater table. Similarly, if a disposal field is installed on a shallow to bedrock soil where site preparation for a disposal field installation results in exposing bedrock, wastewater can travel unimpeded through the gravel fill below the disposal field and into bedrock fractures and then into the groundwater table.

Not many people are aware that septic systems are designed to attenuate pathogens, not nutrients. That is why they are regulated by DHHs and not the DEP. The primary way they do this is by requiring septic systems to be installed far enough away from wells and waterbodies so that pathogens die before they reach them. Nutrients, however, do not die so setback distances are not an effective strategy to attenuate nutrients. In my role as State Site Evaluator and State Soil Scientist, I was called upon to investigate all manner of well and waterbody pollution complaints since they usually also involved soils. One of the cases I investigated involved a number of houses on a street in Fort Fairfield that had wells which were too contaminated to use. The source of contamination was placed on a potato farmer who buried cull potatoes nearby. I proved it was their own septic systems causing the contamination. The disposal fields were installed in sand and gravel. I recommended new disposal fields be installed on top of the topsoil layer, not below it, to take advantage of the finer texture and presence of biologic activity. That was done and the wells have been fine since. In another case, wells were contaminated in a subdivision in Topsham where shallow to bedrock soils were present. I proved it was their own septic systems again. Clean gravel had been placed on top of fractured bedrock allowing effluent to travel untreated to their wells. I recommended replacing their septic systems where some topsoil was placed on top of the bedrock before adding gravel fill. That was done and the wells cleared up. A third case was in the town of Rome where a cove on Long Lake in front of a subdivision experienced algal blooms so great in the summer that the algae had to be raked out at least twice a year. I proved it was their own septic systems causing the algal blooms. They were installed in gravel which allowed nutrients to travel freely to the lake.

While this resolve does not specify how DHHS should reduce nutrient loading from Septic Systems, they do have copies of my documents explaining how I believe the problem should be addressed. My recommendations do not affect the suitability of a property for a septic system and come with very little cost to implement. And the techniques are not new and unproven. They are used on a daily basis. All of our sand/gravel soils have a finer textured topsoil layer, unless it was stripped in the past, so it does not require bringing it to the site. Since 1974, if a sand/gravel soil has a groundwater table at 24" or less, it has to be installed at or above he ground surface. This would only apply to those sand/gravel soils with a deeper groundwater table. For shallow to bedrock soils, stripped topsoil is available on site to place on bedrock to prevent short circuiting, at no additional cost.

I encourage you to read my Short Circuiting Guidance document for a much more detailed explanation and recommendations. The companion document, Soil Potential Ratings for Short Circuiting, is useful in determining where short circuiting soils can be found anywhere in the state, thanks to the Web Soil Survey.

Thank you and I would be happy to take questions. I also make myself available for the work session, if you are interested in having me there.

GUIDANCE FOR EVALUATING SEPTIC SYSTEM DISPOSAL FIELDS TO DETERMINE WHETHER OR NOT A SHORT CIRCUIT IS OR IS LIKELY TO BE OCURRING

DAVID P. ROCQUE January 24, 2025

<u>What is a short circuit and when does it occur?</u>

A septic system short circuit occurs when effluent from a subsurface wastewater disposal field moves through the soil and into the groundwater table relatively untreated. Most of the soil types in Maine do a pretty good job of removing pollutants from wastewater but a few do not. The most common soils that are subject to short circuiting are sandy/gravelly outwash soils and coarse ablation till soils. If a disposal field is installed into the sand and gravel subsoil horizons (coarser than loamy fine sand), little polishing of the effluent takes place. That is because there is little to no cation exchange capacity (CEC)and little to no biologic activity or plant roots to uptake nutrients in the "C" horizon of these soils. Short circuiting can also occur if a disposal field comes in contact with fractures in bedrock or if disposal field effluent is directly connected to bedrock fractures by coarse sand and gravel fill material. A third way septic systems can short circuit is where coarse sand or gravel fill material for a disposal field fill extension connects to or comes close to a drainageway, stream, or ditch that then connects to a waterbody. If the soil below the coarse fill is fine textured and/or has a shallow seasonal groundwater table and is on a slope, effluent from the disposal field will seek the path of least resistance and flow along the interface between the original soil and coarse fill to the concentrated flow channel. This situation is most common in replacement systems but can occasionally occur in first time systems. There is also a fourth way that septic systems can short circuit when they were installed in areas previously filled with gravelly sandy soil. This is mostly a problem in the shoreland zone where wet areas near the shore were filled with coarse textured fill, before permitting was required, to make them dry enough to build on. Many of these areas had a bouldery surface with water near or at the surface in the spring and/or fall. Trenches or cesspools installed in these soils would typically last for a very long time because of very rapid permeability, but would provide very little treatment of wastewater due to the lack of CEC, plant roots, and microbes. Today, such areas would be classified as wetlands or hydrologically sensitive areas where filling would be prohibited (or should be prohibited). These areas are mostly a threat to surface water quality and not groundwater quality (except for any downgradient dug wells).

Pollutants in septic system effluent

From a human health perspective, the pollutant of greatest concern in wastewater is pathogens. Pathogens can and do make people sick and can even cause death on occasion. Fortunately, pathogens can only live for a relatively short period of time outside their preferred host. So, if a disposal system is setback sufficiently from a waterbody or well, pathogens will die before they get to the waterbody or well, rendering them harmless. The same, however, is not true for nutrients. They do not die. If they reach the groundwater table, particularly within the shoreland zone or near a waterbody, they will eventually reach the waterbody and can significantly affect the water quality of the waterbody. The nutrient of greatest concern in freshwater is phosphorus. It is considered to be the limiting factor for an algae bloom to occur in lakes and rivers. In marine waters, nitrogen is the limiting factor. In any waterbody experiencing an algae bloom, any increase in nutrients will most likely cause the bloom to be worse. It is therefore of great importance to eliminate as many sources of nutrients reaching our surface waters, including septic systems, as possible.

Disposal field designs to reduce nutrient loading to groundwater and surface waters

The most cost effective and simplest way to limit nutrient loading to surface waters from septic systems installed in coarse textured soils is to design disposal fields on top of or in the topsoil layer of coarse textured soils. Coarse textured soil profiles of greatest concern for short circuiting are profiles 5, 6, sandy 11 and some profile 4 soils. In their unaltered condition, all of our coarse textured soils have a topsoil layer deposited on top of the sand and gravel subsoil layers. This fine textured soil was deposited as wind-blown material in the time from when the last glacier retreated, leaving the soil surface bare, until the soil became vegetated again. Virtually all the biologic activity including plant roots and CEC can be found in the topsoil layer of these soils. There is little available water or nutrients for soil microbes or plant roots in the coarse sand or gravel layers and they have very little if any CEC. If a disposal field is installed on top of or partly into this topsoil layer, many pollutants will be filtered out before it reaches the sand or gravel layers. In addition, because of the great difference in soil pore size between the topsoil layer and sand/gravel layer below (known as a lithologic discontinuity), wastewater will be drawn by capillary attraction laterally instead of vertically into the sand or gravel layer below, further protecting the groundwater table and any nearby surface waterbodies. Using native topsoil layers that are relatively undisturbed is important because that protects the soil structure which is responsible for pores in the soil through which air and water move. If the topsoil layer is removed and then replaced, the soil structure will be destroyed, eliminating the primary path for water to move into and through the soil. If the topsoil over a coarse textured soil has been removed previously, it should be replaced with soil material that will allow reasonable infiltration, without naturally developed soil structure but has enough fines to provide some treatment. That material would be a gravelly coarse sand with 5% - 8% fines passing the #200 sieve (the SSWWD Rules allow backfill material to have as little as 2% fines so this is a higher minimum percentage).

In the case of shallow to bedrock soils, the risk for short circuiting begins with site preparation by the contractor. If the contractor scrapes enough soil to expose fractured bedrock and then places coarse sand or gravel on top of the bedrock, effluent will move rapidly through the sand and gravel and into the cracks in the bedrock. The easiest way to prevent this short circuit is to either avoid exposing bedrock during site preparation or to place some of the soil removed during site preparation back on top of the bedrock surface. Fine textured soil will have small capillary pores to slow down effluent movement into the fractures and will facilitate lateral movement of the effluent in capillary pores in surrounding soil. Soil pores are not important in the thin fill material above bedrock because you do not want effluent to freely enter any bedrock fractures. The remainder of any fill material used to create the required 24" separation between the bottom of a disposal field and any underlying bedrock should meet the backfill standard found in the SSWWD Rules.

In the case of coarse fill being used on a replacement system near a drainageway, ditch, stream or other waterbody, a clay berm or dike should be installed near the toe of fill on the downslope side and sides of the drain field to contain effluent and force it into the ground below the disposal field.

In the case of wet bouldery areas that were filled in the past with coarse textured soil, the main threat is from septic systems installed in the shoreland zone years ago. If a first time or replacement system is to be installed in such an area, it should follow the protocol outlined above for sandy/gravelly soils. The disposal field should be installed on top of the ground, on any topsoil layer. If no topsoil layer is present, it should be created by using backfill material with 5% - 8% fines and then the disposal field should be installed on top of the newly created topsoil layer.

<u>Process to identify soils subject to short circuiting and septic systems previously installed in soils subject to short circuiting</u>

First time disposal fields and replacement disposal fields should be designed and installed as described above to minimize pollutants moving into the groundwater table and surrounding surface waters relatively untreated. For systems already installed, particularly in the shoreland zone, an evaluation should be conducted to determine if they may be experiencing a short circuit. The following is a process which can be followed to make such determinations.

1. The first step is to determine whether or not the septic system is in a soil subject to short circuiting. If the soil does not have sand and gravel sub-horizons and is not shallow to bedrock, it is not subject to short circuiting unless it is close to a waterway or waterbody where the fill extension can cause a connection. There are several ways to determine soil types.
    a. Use the Web Soil Survey to see the soil types mapped by the Natural Resources Conservation Service (County soil maps). While these soil maps are not site specific, they can provide useful information about the likelihood of

finding a soil type subject to short circuiting. This method would need an on-site verification. See the document "Soil Series Ratings for Having a Short Circuiting Septic System Based on Soil Properties" dated June 6, 2024 to be used in conjunction with checking the NRCS soil maps.

   b. Refer to the HHE-200 (septic system design form), if available. This form provides soil profile data compiled by the Site Evaluator who designed the system. Not all homes or cottages will have a copy of this paperwork, but some will. For newer homes or cottages, you can check with the town Local Plumbing Inspector or go on-line to check a data base provided by the State Septic System Program to see if there is a form on file for the structure (search Maine Subsurface Wastewater Disposal Unit and then click on On Line Permit Search). As a note of caution, older septic system designs, prior to 1990, may have inaccurate soil profile information. That is because, in the early days of the Site Evaluation Program (started on July 1, 1974), a number of Site Evaluators were "grandfathered" because the State needed people to do the designs. Over time, those grandfathered have retired or otherwise left the profession and much better training is now available. Site Evaluators today are generally much better trained and qualified than in the early days of the program.
   c. Do an on-site evaluation of soil types present – This can be done by a Licensed Site Evaluator, a licensed Soil Scientist but can also be done by a trained lay person. A lay person would not be able to determine the soil profile designation or soil series name, but they could determine if the soil was sandy/gravelly or shallow to bedrock. If a lay person believed that the soil was sandy/gravelly or shallow to bedrock, it should be confirmed by a Site Evaluator or Soil Scientist.

2. Once the soil type on a property has been determined, those soil types not subject to short circuiting can be eliminated from needing to have a short circuit evaluation, with the exception of sites where a disposal field has been installed close to a waterway or waterbody.
3. For sites determined to have soils subject to short circuiting, the next step would be to determine if the disposal field was installed into the ground and if so, how deeply and what type of system it is comprised of.
   a. How deeply the disposal field was installed into the ground – Many of our soils that are subject to short circuiting have a shallow depth to the seasonal groundwater table. In those cases, the disposal field would be installed on top of or above the original ground surface. The Maine Subsurface Wastewater Disposal Rules (SSWWD Rules) require a minimum of 24" between the bottom of the disposal field and the seasonal groundwater table for sandy/gravelly soils and shallow to bedrock soils. If the topsoil layer was left in-tact, after removing any organic material on the surface, it would not

be subject to short circuiting. This can be determined by reviewing the HHE-200 form (disposal field cross-section), if available, and by looking at how high above the ground surface the disposal field is (a mounded system). If you do not have the HHE-200 form to review and are not sure how mounded the system is, a trained professional could excavate a soil pit beside the disposal field to observe the depth to sand and gravel layers. Soil pits should be as close to the toe of fill as possible, on the upslope side or at the ends of the disposal field.

b. Type of System – there are a number of disposal field types available to Site Evaluators these days. Up until the late 1980's, the only systems available were stone and pipe beds or trenches and concrete chambers. Today, there are a number of what we refer to as "proprietary Devices" that are available to be used in place of stone and pipe. Some of those devices reduce or eliminate the accumulation of organic material at the disposal field/soil interface referred to as a "Bio-mat". A bio-mat nearly always forms at this interface in stone and pipe systems and chambers, if installed in soils not subject to short circuiting and the system is used on a regular basis. We also have today a number of what the industry refers to as "Advanced Treatment Units". These ATU's generally oxidize the organic matter in effluent so no bio-mat forms. A few also reduce the nitrogen content of effluent but none currently available reduce the phosphorus content. The presence or absence of a bio-mat is a good measure of whether or not a short circuit is occurring in soils where a stone and pipe bed or chambers are used without additional treatment (ATU). The absence of a bio-mat is not a good measure of whether or not a short circuit is occurring if proprietary devices are used that reduce organic material or an ATU is used. However, the presence of a bio-mat is almost always an indication that a short circuit is not occurring. A couple of exceptions would be for a disposal field installed in a sandy or gravelly soil, in the sand or gravel layer, too close to the seasonal groundwater table so hydraulic failure is occurring and where fill extensions are close to or at the edge of a concentrated flow channel.

4. Determining if a Disposal Field is or is not Short Circuiting – After going through the process of elimination for disposal fields subject to short circuiting, those remaining as potential short circuits should be evaluated to see if they are or are likely to be short circuiting. This step would require excavating one or more soil pits into the disposal field or at the very edge if proprietary devised are used that would prevent excavating soil pits into the disposal field itself. It may be possible to use a soil auger to make this determination. If a soil auger is used and evidence of saturated soil/ponded water is observed, a short circuit is not occurring unless the system is installed into the seasonal groundwater table of a sand or gravel layer, or the fill extension connects to a concentrated flow channel or waterbody. If no ponded water

or soil saturation is observed, a shovel pit should be excavated in the disposal field to look for the presence of plant roots or a bio-mat. The pit should extend into the soil below the bottom of the disposal field to see if any fine textured soil is present below the bottom of the disposal field (loamy fine sand or finer). If fine textured soil is observed, a short circuit is not occurring. If no soil saturation is observed, no plant roots or limiting impediment to rapid infiltration including fine textured soil is observed, a short circuit is likely to be occurring (if the system is used with any regularity).

SOIL SERIES POTENTIAL FOR HAVING A SHORT CIRCUITING SEPTIC SYSTEM BASED ON SOIL PROPERTIES

June 6, 2024

The following soil series are rated on the potential for them to have short circuiting septic systems, based on soil texture and depth to bedrock. A short circuit occurs when effluent from the leach field freely drains into a coarse textured soil horizon or bedrock fractures without being partially renovated first, on its way to the groundwater table. In most leach fields that are used **year-round**, particles escaping from the septic tank plus the living and dead bodies of microbes partially fill some of the voids in the soil below it forming what is called a "bio-mat". This bio-mat is where a great deal of the treatment from a septic system occurs and is an essential part of a properly functioning septic system. The bio-mat looks like a black gelatinous material that coats sand and rocks at the interface between the bottom of the leach field and soil below. The soil, including plant roots and soil microbes, then finish the treatment process. This bio-mat usually causes some ponding of effluent as it is quite slowly permeable. The presence or absence of a bio-mat can usually be determining by the presence of ponded effluent. If however, the bottom of the leach field is on or in a coarse sand or gravel or rests on fractured bedrock, particles and microbes may not be able to accumulate to the degree that a bio-mat is formed. If that happens, the wastewater, along with most of the phosphorus, can travel down to the groundwater table and then move to a nearby lake, pond or stream. Not only do sandy or gravelly soils not always form a bio-mat, they do not provide as much treatment as do finer textured soils (silt and clay provide most of the soil treatment) so many of the nutrients can reach a waterbody, if nearby. You should also be aware that some of the newer types of leach fields such as Eljen In-Drains, Enviro-Fins, fabric wrapped pipes and advanced treatment units remove particulates from the wastewater so a bio-mat will not form even if the soil is not sand or gravel. You therefore, need to take the type of leach field into consideration when evaluating the short circuit potential of a newer septic system in any soil type. It is also important to consider the frequency of use of a septic system and how much of the year it is used. Lightly used septic systems (a single elderly person, for instance) or those used only a few weeks a year, may not have a bio-mat because of low usage or because there is a long enough time between usage (seasonal dwellings) that the bio-mat is decomposed each off-season. It is also important to understand that a short-circuit will not occur if the disposal field is installed completely into a fine textured soil, unless the bottom of the disposal field rests on or is connected to fractured bedrock or sand/gravel layers by sandy/gravelly fill material.

When considering the potential for a soil series identified on a soil map developed by the Natural Resources Conservation Service (NRCS) to have a short-circuiting septic system, it is important to keep in mind the following: 1) soil series established by the NRCS have an allowable "range of characteristics" meaning that they can have variable textures, thicknesses of soil horizons and other variable soil properties. This rating is based on the average of those properties (based on the "official Soil Series" description by the NRCS), 2) most of the soil mapping by NRCS was done in the 1940's – 1970's. A lot has happened over the years that may have altered the soils including topsoil removal, erosion, sedimentation, adding fill, culverts draining on the land and drainage ditches being dug. Those soils may now not have the same characteristics they did when the mapping was done, 3) County soil maps can only show different types of soil as small as about 3 acres. Any different type of soil encountered that is smaller than 3 acres will not show up on a County soil map and is considered to be an "inclusion". It is possible that a septic system is installed in an inclusion within a soil map unit that differs from the named soil series, sometimes they are significantly different, 4) septic system design and installation are important factors affecting the likelihood of short circuiting. If a leach field is designed to be installed on top of the ground over a sandy soil with a fine textured topsoil layer, the likelihood of a short circuit is small but if the leach field is designed to be installed below the topsoil layer, into sand or gravel, the likelihood of a short circuit is much greater. The same is true for the installation. A contractor may over excavate the topsoil layer of a sandy soil and then place sand/gravel in the excavation so it will be at the correct elevation. This can result in a direct connection between the bottom of the leach field and the sand or gravel below even if the design shows the bottom of the leach field being on top of or within the finer textured topsoil layer, and 5) Age of System. Septic systems installed prior to 1974 were based on a "perc test" as compared to our present system of "Site Evaluation" which is a much more accurate and we have many more types of systems to use now. Also, beginning in 1995, all septic systems installed within the shoreland zone in coarse textured soils were required to use a liner of soil material that had some silt in it below and beside the leach field to slow down infiltration and encourage the formation of a bio-mat. Unfortunately, contractors tend to err on the side of using fill material that is on the too coarse side so the fill material does not provide fine soil particles to slow down effluent and remove some of the nutrients. Septic systems installed in sandy or gravelly soils prior to 1974 have a very high likelihood of short circuiting. Septic systems installed between 1974 and 1995 have a greater likelihood of short circuiting than those installed after 1995 but less than those installed prior to 1974.

In the rating system below, I based the relative risk of a short-circuit on the texture of the soil parent material below any topsoil layer and the likelihood that the bottom of a disposal field would be installed on top of or into sandy or gravelly subsoils. If it is very likely that a disposal field bottom will connect with sandy or gravelly subsoils, the rating is very high. The less likely that there will be a direct connection between the bottom of a disposal field and sandy or gravelly subsoil layers, the lower the rating will be.

Soils with very high potential to have short circuiting septic systems: Soil names in () are names no longer used in Maine but may be found on older versions of County Soil Survey maps. These sandy/gravelly outwash soils are well to excessively drained (no seasonal groundwater table within 48" depth) so it is very likely that the bottom of a disposal field will be installed at least 24" below the ground surface and into sand or gravel layers.

Hermon, Colton, (Hinkley) Monadnock, Masardis, Stetson, Adams, Sunday, (Windsor), (Merrimac).

Soils with high potential to have short circuiting: These sandy/gravelly outwash soils are moderately well drained meaning that the seasonal groundwater table is present between 16" and 48" below the mineral soil surface. The septic system rules require a 24" separation between the bottom of a disposal field and any limiting factor (seasonal groundwater table, hardpan or bedrock) in sand and gravel outwash soils. That means a soil would need to have a seasonal groundwater table at a depth of greater than 24" for the disposal field to be installed into the ground and 36" for the disposal field to be installed 12" into the ground (the thickness of the topsoil layer for most outwash soils). There is therefore, a less but still significant likelihood that a disposal field will be installed down into the sand and gravel layers so it is rated as high instead of very high.

Skowhegan, Duane, (Ninigret), Croghan, (Deerfield), Waumbek, Sheepscot, Madawaska, Machias.

Soils with moderate potential to have a short circuit: Some of these soils have thick topsoil layers that may be over 24" thick (Allagash and Fryeburg) or are somewhat poorly drained (15" – 7" to swt), poorly drained (less than 7" to swt) and very poorly drained (swt at or above the mineral soil surface) meaning that a disposal field would have to be installed above the original ground surface to achieve a 24" separation distance from the bottom of the disposal field to the seasonal groundwater table. Wet soils do not usually have all of the topsoil layer removed, down to the sand or gravel layers, in order to install a disposal field so the risk of a short-circuit is relatively low but is still there and there is not much depth to the groundwater table.

(Agawam), Allagash, (Fredon), Fryeburg, Naskeag, Naumburg, Kinsman, Moosilauke, (Walpole), (Au Gres), (Finch), (Saugatuck), (Red hook), Atherton, (Halsey), Scarboro, Searsport.

The following soils have a very high or high rating for the potential to have a short-circuiting septic system but not due to soil texture. They have a high rating because bedrock is present in them at a depth of less than 20" (few septic systems are installed below a depth of 24"). These soils have suitable soil textures to encourage the formation of a bio-mat and provide additional treatment by the soil. The risk in these soils is if the bottom of a leach field rests on fractured bedrock or if the contractor over excavates native soil over bedrock and then uses coarse sand or gravel fill between the bottom of the leach field and bedrock. If native soil material is present between the bottom of the leach field and bedrock, the potential for a short circuiting is very low. If there is a direct connection between the bottom of the leach field and bedrock or coarse sand or gravel fill is used between the bottom of the leach field and bedrock, the potential for a short circuit is very high. It is also important to note that hard granitic bedrock poses the highest potential for contamination of a nearby body of water and sedimentary bedrock poses the lowest potential. That is because sedimentary bedrock is often soft in the top, where it meets mineral soil, and thereby acts more like soil than hard bedrock does. Sedimentary bedrock has to be relatively hard to have open fractures.

Very shallow to bedrock soils (Less than 10") with a very high potential for a short circuit: These soils are very shallow to bedrock meaning that there is less than 10" of soil over bedrock so the likelihood that a contractor will scrape it all off when preparing to install a disposal field is quite high. The sandy/gravelly fill material used for the installation of a disposal field may then rest directly on fractured bedrock causing a short circuit.

Abram, schoodic, Ricker, Knob Lock, Mahoosuc.

Shallow to bedrock soils with high potential for a short circuit: These soils have a depth to bedrock of 10" – 20" and likely have inclusions of soils with a shallower depth so the likelihood of a contractor scraping all of the soil from at least some bedrock areas is high but not as high as for very shallow soils.

Thorndike, Monson, Corrina, (Benson), Creasey, Lyman, (Hollis), Hogback, Saddleback, Canaan.

The only way to really find out what your actual soil type, where your leach field is installed, is to have a site-specific soil investigation done by a soil scientist or site evaluator. You can also look at the HHE-200 form for a septic system already installed to see what the soil type is and if there is bedrock present and at what depth.