

Planning Board Workshop | March 8, 2022

Lake Auburn Watershed Ordinance Updates

Planning, Permitting & Code



AGENDA

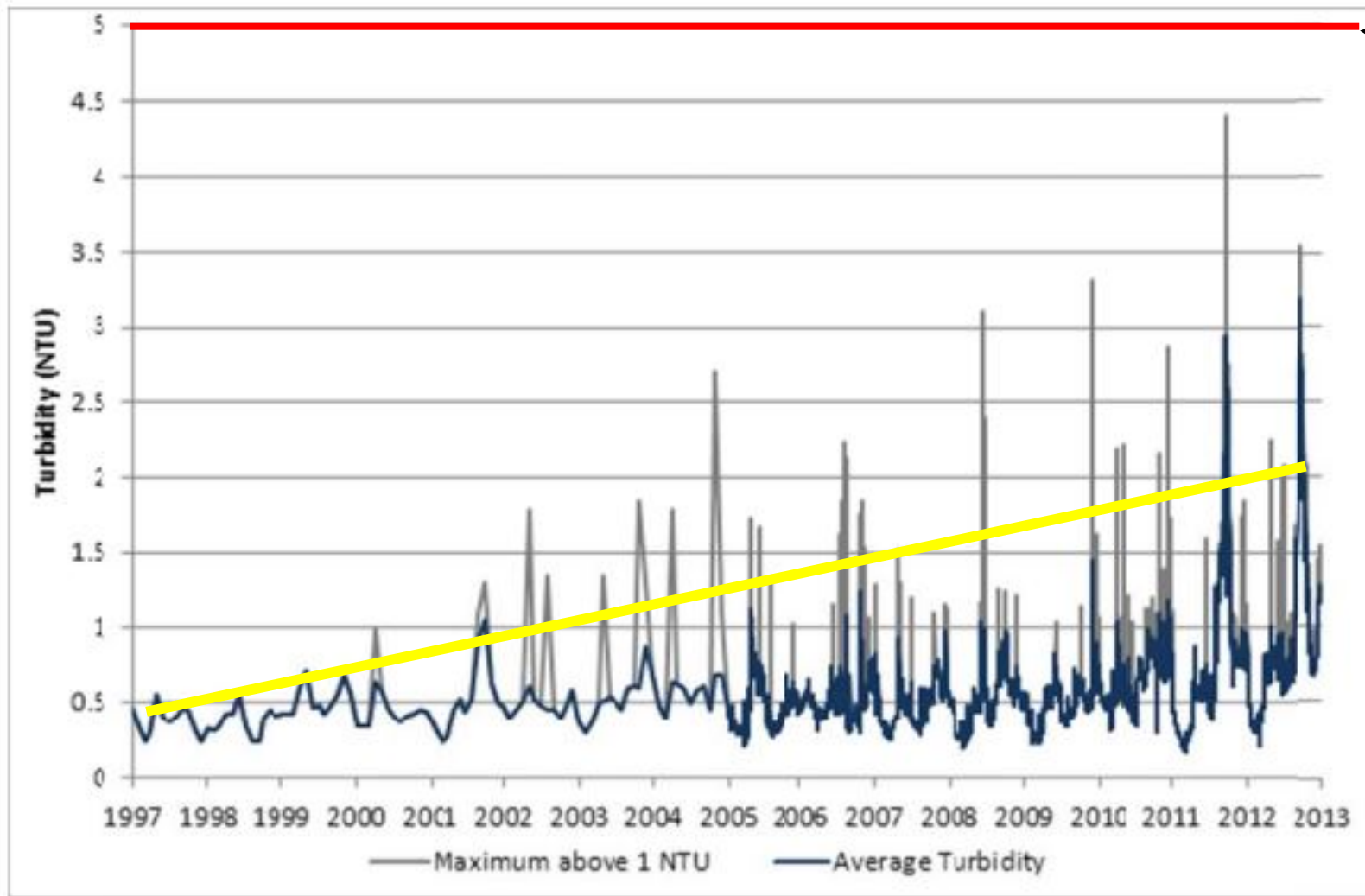
Proposed lake auburn watershed ordinance updates

- Sense of **urgency** (can't wait on protection of public water supply)
- Guiding **team** to adopt and guide ordinance update (identify stakeholders)
- What is the **vision & strategy** (why and how)
- Greater **understanding & buy-in** (technical information)
- **Follow-up** with change and results (year 2, 4, 6)

URGENCY!

- **The source of drinking water** for Auburn & Lewiston
- Lake Auburn high water quality has entitled the Auburn Water District to a **waiver from filtration** from the EPA; one of only 10 water utilities in Maine to do so.
- Development pressures – **LD1884, LD 1312** & lack of housing opportunities.
- Older developed lots without watershed protections (existing septic systems).

STATE OF LAKE AUBURN

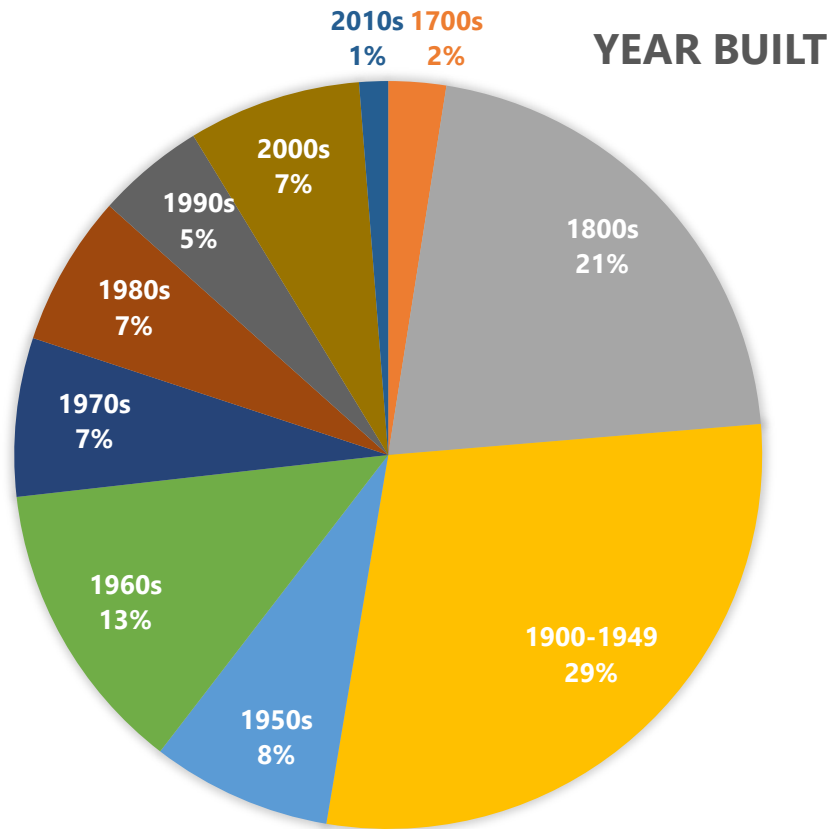


A Compliance Perimeters; 5 Nephelometric Turbidity Unit (NTUs). Measurement of suspended solids in the water.

In 2011 and 2012, however, water quality was degraded due to a combination of factors that raised turbidity in the lake to near the limit allowed under the filtration avoidance waiver granted to the Auburn Water District and Lewiston Water Division (AWD/LWD).

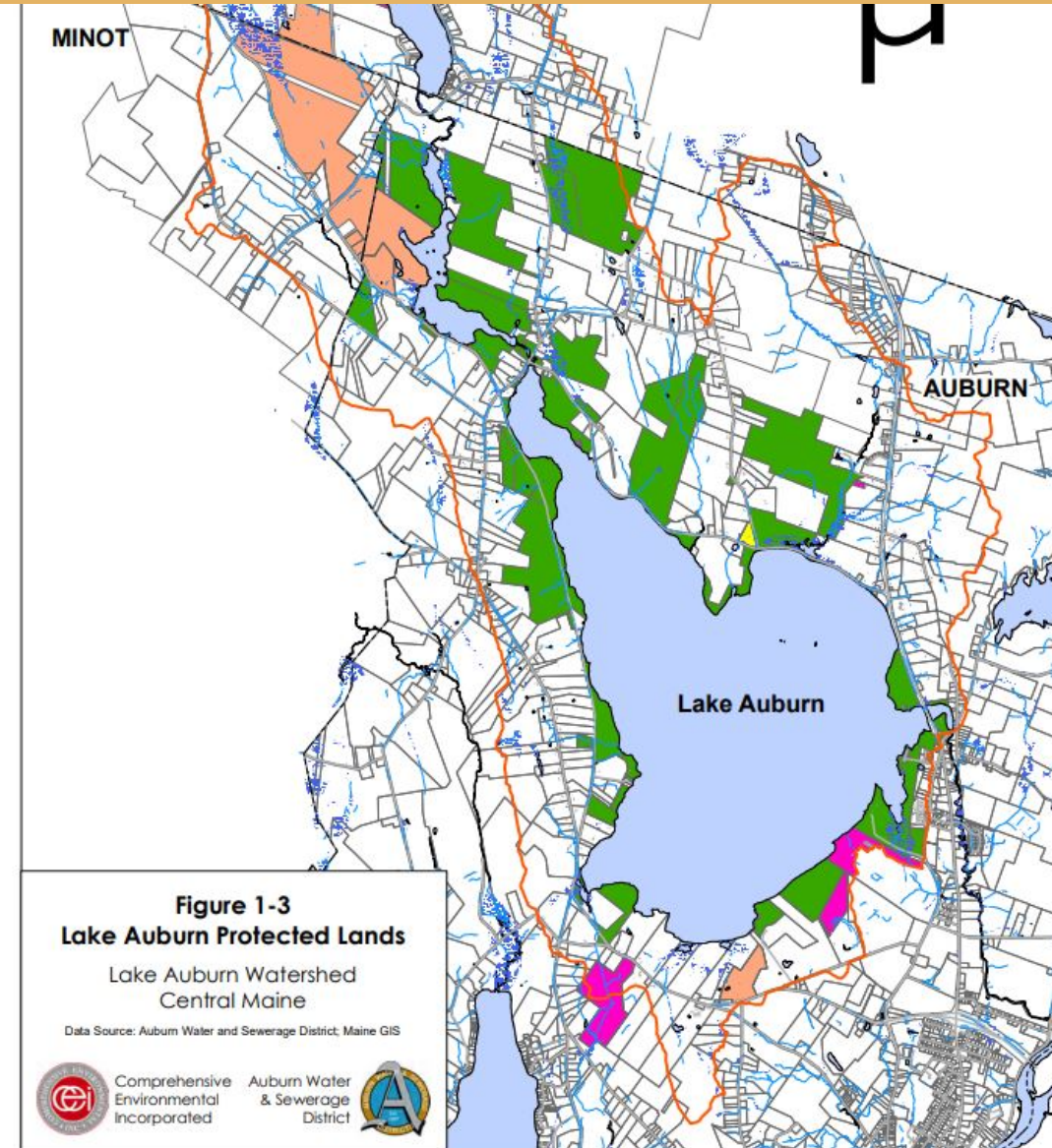
Average and Maximum when above 1 NTU Raw Water Intake Turbidity for 1997 to 2013

THE WATERSHED NUMBERS



YearBuilt	
1700s	8
1800s	68
1900-1949	93
1950s	25
1960s	41
1970s	22
1980s	21
1990s	15
2000s	24
2010s	4
Grand	321

275 systems are grandfathered to state subsurface wastewater standards for replacement systems out of a total of 321. (10-144 CMR 241), Maine Subsurface Wastewater Disposal Rules, Section 4, Design Criteria allows down to 9" (limiting factor) outside the shoreland zone.



VISION

Reports

Diagnostic Study of lake Auburn: Phase 1

Diagnostic Study of Lake Auburn: Phase 2

Lake Auburn Watershed Management Plan (2010)

A Regulatory Environmental, and Economic Analysis of Water Supply Protection Auburn, Maine (2021)

Recommendations from 2021 Report that align with 2010 Report

- 1.) Align the septic system regulations contained in the Lake Auburn Watershed Overlay District Ordinance with the best available science and Maine's septic system regulations.
- 2.) Develop a clear set of standards for farm management that will limit phosphorus loading from commercial agricultural activities.
- 3.) Incorporate low impact development requirements for new single family residential development.

Other Recommendations:

- 1.) City is to increased density in other areas of the community.
- 2.) City to foster a working relationship with stakeholders
- 3.) City continue to support small watercraft restrictions.
- 4.) City support implementation of BMPs.
- 5.) City should support local YCC for summer conservation work.
- 6.) City recommends larger lot frontage in LDCR

TEAM APPROACH & ORDINANCE IDENTIFICATION

Stakeholders:

City of Auburn and city of Lewiston

(city-wide residents, mayor, council and staff)

Auburn & Lewiston water districts and consultants

Ordinances to be updated and Community Conversations Considerations:

1.) Limit additional suitable natural soil or fill material to 12".

2.) Require a septic inspection at point of sale in the Auburn Watershed Overlay Area.

Sec. 60-952 (c) *Agricultural buffer strip*. Where land adjoining Lake Auburn or its perennial tributaries is tilled for agricultural purposes, an untilled buffer strip ~~50~~ 100 feet wide shall be retained between the tilled area and the normal high-water mark. This subsection (c) shall not be interpreted as permitting agricultural tillage in any zoning district in which it is not otherwise permitted.

(f) *Private sewage disposal systems*. The following regulations shall be adhered to in the development of private sewage disposal systems in the Lake Auburn Watershed:

(1) ~~Subsurface absorption Disposal~~ areas shall not be permitted on sites on which ~~the highest seasonal groundwater table, bedrock, or other impervious layer~~ is less than 12 inches to the limiting factor, 36—12 inches below the bottom of the organic horizon. Not less than 24 inches of suitable soil shall be present below the bottom of the subsurface absorption area. The bottom of such subsurface absorption area shall not be less than 12 inches below the bottom of the organic horizon measured from the lowest point on the subsurface absorption area. In addition, having at least 24 inches of suitable natural soil or fill material below the bottom of the disposal field and (the mineral soil surface) to result in a 36-inch separation between the bottom of the disposal field and the limiting factor.

(2) Within areas containing soils described as deep, ~~loose~~ and sandy or gravelly and which contain more than ~~70 percent~~ sand or gravel outwash or stratified drift as shown on table- ~~4D (profiles 5 or 6 and some 11) of the State of Maine Subsurface Wastewater Disposal Rules 10-144 Chapter 241 9-3 of the state plumbing code, part II (April 25, 1975)~~, no subsurface absorption area shall be installed closer than ~~300~~ 400 feet to the normal high-water mark of any lake, pond, or year-round or intermittent stream. Where the daily sewage flow is or is reasonably likely to be in excess of 2,000 gallons, the system shall be located at least 1,000 feet from the normal high-water mark of any lake, pond or year-round or intermittent stream.

(3) All disposal areas, replacement or new shall meet the section 60-952 (F) (1) design criteria. If replacement systems cannot meet Section 60-952 (F) (1) The local plumbing inspector must evaluate the design with concurrence from the Auburn Water District to impart as much design criteria to the replacement system.

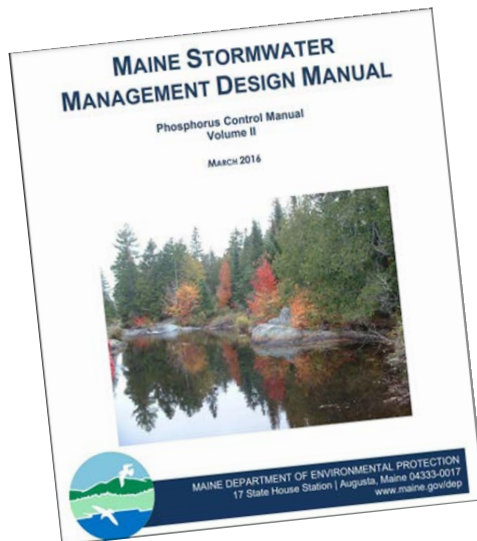
(4) All private sewage disposal systems shall have a curtain drain installed per section H, 10-144 CMR 34 of the Maine Subsurface Wastewater Disposal Rules or diversion ditch, upslope of a disposal field, for its entire length including fill extensions as determined by groundwater conditions by a Licensed Site Evaluator.

(5) All private sewage disposal systems shall be installed on the lot of the dwelling unit, unless the system can be developed outside the watershed or in under special conditions replacement systems may approve by local plumbing inspector on adjacent lots.

PHOSPHOROUS ORDINANCE SECTION 60-1070 TEXT AMENDMENT

Sec. 60-1070. Submission requirements.

All projects subject to review under the provisions of this division shall submit a phosphorus control plan and maintenance provisions meeting the standards set forth in ~~the manual Phosphorus Control and Lake Watersheds A Technical Guide to Evaluating New Development design criteria of the Maine Department of Environmental Protection, Maine Stormwater Management Design Manual, Phosphorus Control Manual Volume II, March 2016. (Maine DEP et al., September 1989, with the Simple Review Method revised in May 1990).~~



- Utilizes most current design manual available for Phosphorus Control
- Implements the use of low impact development (LID) techniques
- Focus on infiltration techniques best management practices. (BMP)

TECHNICAL INFORMATION

- Existing Conditions
- LID
- Buffers
- Stormwater Controls
- Soils
- Septic Design



Picture credit: City of Portland, Oregon, 2016.

Grassy Swales and Vegetated Swales (Bioswales)
Description
Gently sloping vegetated channels/depressions that convey stormwater and remove pollutants by sedimentation and infiltration through the soil. Maintenance requirements include litter removal and landscaping. Vegetated swales with native or non-invasive plants are preferable to grassy swales, which function primarily as a stormwater conveyance system.
Conditions Suited For
Swales require shallow slopes, well-draining soils, and a minimal width of 3 feet. They are typically long channels placed at the side of a road or parking lots. Where soils don't drain well, swales can overflow to an approved discharge location (typically, another BMP).
Additional Information
Maine Stormwater Management Design Manual Vol III Chapter 8.1. Vegetated Swale



Picture credit: Joy Stewart, USEPA.

Raingardens
Description
Landscaped depressions that collect runoff in a vegetated soil medium, where water infiltrates back into the ground, is absorbed by plants, evapotranspirates, or is redirected. Raingardens require some maintenance, such as watering during extreme droughts, and general landscaping. Raingardens should be planted with native or non-invasive plant species
Suitable for
Can be used in small residential installations to capture driveway or roof runoff, or to complement other BMPs in larger developments. Plants must be able to tolerate both dry and wet conditions.
Additional Information
Vermont Rain Garden Manual Native Plants for New England Rain Gardens New Hampshire Homeowner's Guide to Stormwater Management Do-It-Yourself Stormwater Solutions

Appendix 2

Current Septic Design Standard

Auburn Zoning Ordinance Section 60-952(f)(1): Subsurface absorption areas shall not be permitted on sites on which the highest seasonal groundwater table, bedrock or other impervious layer is less than 36 inches below the bottom of the organic horizon. Not less than 24 inches of suitable soil shall be present below the bottom of the subsurface absorption area. The bottom of such subsurface absorption area shall not be less than 12 inches below the bottom of the organic horizon measured from the lowest point on the subsurface absorption area.

The Implication: Local standards within the Lake Auburn Watershed Overlay District limit development on a significant portion of the watershed by effectively prohibiting the use of innovative and alternative septic system and leach field designs to meet the 'depth to constraining layer' requirement. These innovative and alternative designs are otherwise allowed by the State and can achieve comparable or better nutrient removal than a traditional system and leach field.

Recommended Septic Design Standard

The Recommendation: Maintain a requirement for a minimum depth of 36 inches above the constraining layer (groundwater or bedrock), while allowing the use of State-approved alternative septic system and leach field designs that meet statewide standards.

This can be achieved by referencing the Maine Subsurface Wastewater Treatment Rules (10-144 CMR 241), with the exception that the required depth to the constraining layer would be at least 36 inches (specified by updating Table 4-F, Minimum Permitting Requirements and Minimum Design Requirements). Because the State rules already provide for the use of such alternative designs such as mounded leach fields and drip distribution systems, as well as other proprietary systems, these would be allowed in the Lake Auburn watershed as well.

SOILS



Photos of Maine soils. The first (1.) one shows an outwash soils with a finer textured topsoil layer. The second (2.) one shows a field profile typical in Maine where there is no organic horizon, just a plow layer. The third (3.) shows a spodosol, our most famous soil profile. We used to have a lot of these, but many have been destroyed by farming, forestry (skidding) or development. Note that all three-show little rooting below the upper most layer of soil.

Soil Filter Media: From the bottom-up (lower fill layer) consists of a loamy sand (see spec.) and a minimum of 6 inches of upper fill layer. (see specification)

New Soil Media Specification

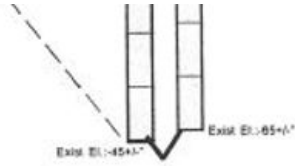
Upper Fill Layer	
Sieve #	% Passing by Weight
No. 4	75-95
No. 10	60-90
No. 40	35-85
No. 200	20-40
200 (clay size)	<2.0

Lower Fill Layer	
Sieve #	% Passing by Weight
No. 10	85-100
No. 20	70-100
No. 60	15-400
No. 200	6-8
200 (clay size)	<2.0

Replacement Disposal Profile

18 - 6" Plastic Chambers
 (High Capacity- 16" high, CODE Table 6B)
 USE any equivalent brand & length
 of Plastic Chamber

2 trenches of 9 Chambers (56 ft. long)
 @ 6 ft. center to center



> = 4" Solid PVC Connection Pipe

FILL REQUIREMENTS

Depth of Backfill (Upslope) 0 "

Depth of Backfill (Downslope) 0 +/- "

DEPTH AT CROSS-SECTION (shown below)

CONSTRUCTION ELEVATIONS

Finished Grade Elevation (Top Row **) -39 "

Top of Distribution Pipe or Proprietary Devices -47 "

Bottom of Disposal Area -63 "

Bottom of Sand Layer -69 +/- "

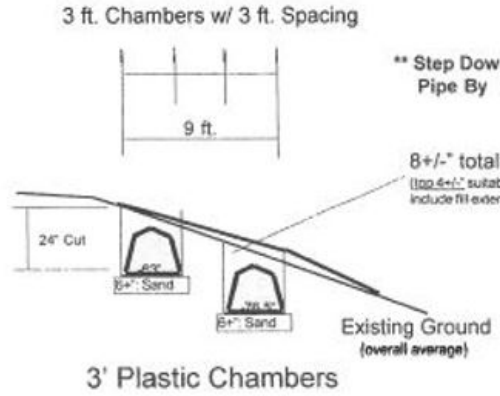
ELEVATION REFERENCE POINT

Location & Description top of bottom step

Reference Elevation is: 0.0 " or:

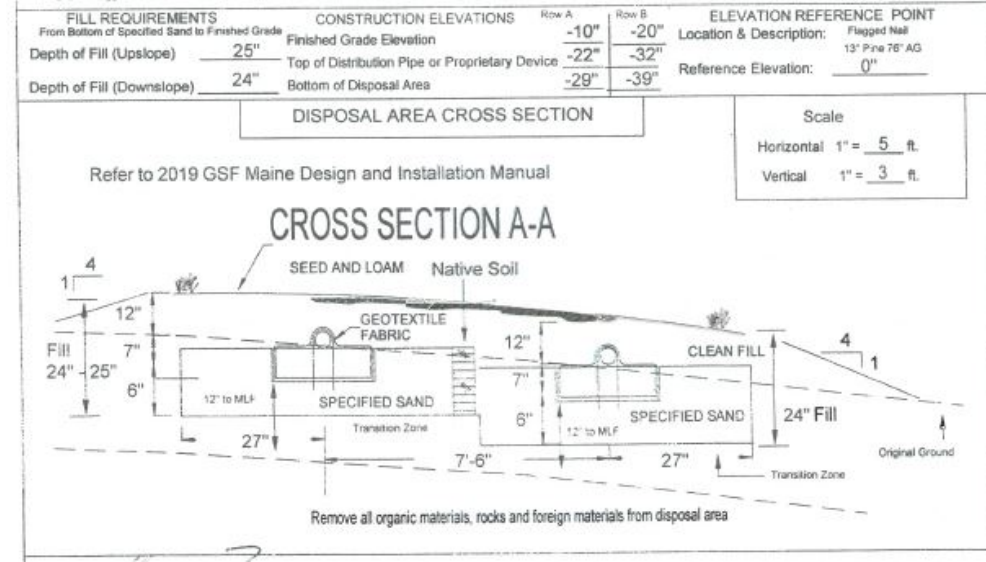
Scale:
 Vertical: 1" = 5 Ft.
 Horizontal: 1" = 10 Ft.

DISPOSAL AREA CROSS SECTION



** Step Down Connection
 Pipe By 13.5" Each

8 +/-" total cover over Devices
 (top 6 +/-" suitable for Grass Growth, Sect 504.2.6,
 include fill extensions)



SOIL PROFILE DESCRIPTION AND CLASSIFICATION

Observation Hole 1 Test Pit Boring

Depth of Organic Horizon Above Mineral Soil

Texture	Consistency	Color	Mottling
Loam		Dk. Br.	
Fine Sandy Loam Till	Friable	Brown	
		Ol. Br.	

Soil Classification: 3 C Slope: 19% Limiting Factor: 36

SOIL DESCRIPTION AND CLASSIFICATION

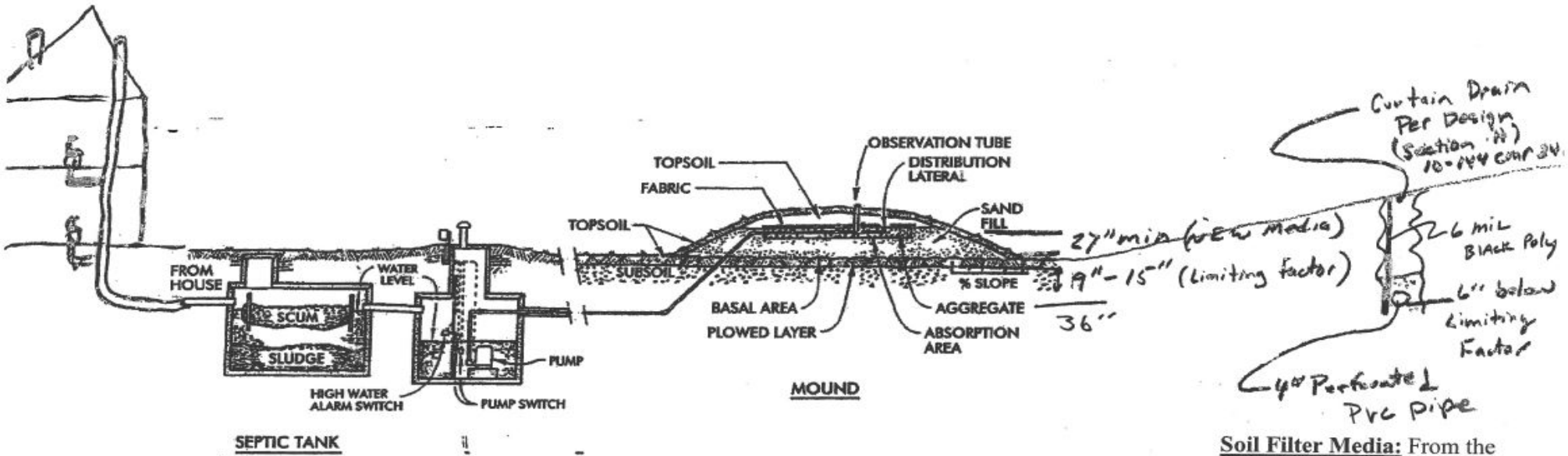
Observation Hole 1 Test Pit Boring

Depth of Organic Horizon Above Mineral Soil

Texture	Consistency	Color	Mottling
GRAVELLY LOAM SAND	FRAGILE	YELLOWISH BROWN	
GRAVELLY SAND	FIRM	OLIVE BROWN	WATER

Soil Classification: 3 D Slope: 10% Limiting Factor: 10

Ground Water Restricting Layer 3% Depth



- Peer review: David Rocque, retired state soil scientist & currently licensed site evaluator & soil scientist

- Mottling of soils | restrictive layer | restrictive layer | seasonal high-water table

- Curtain drains - effectiveness of protection of septic disposal fields during high water table conditions and saturated soils from high rain events

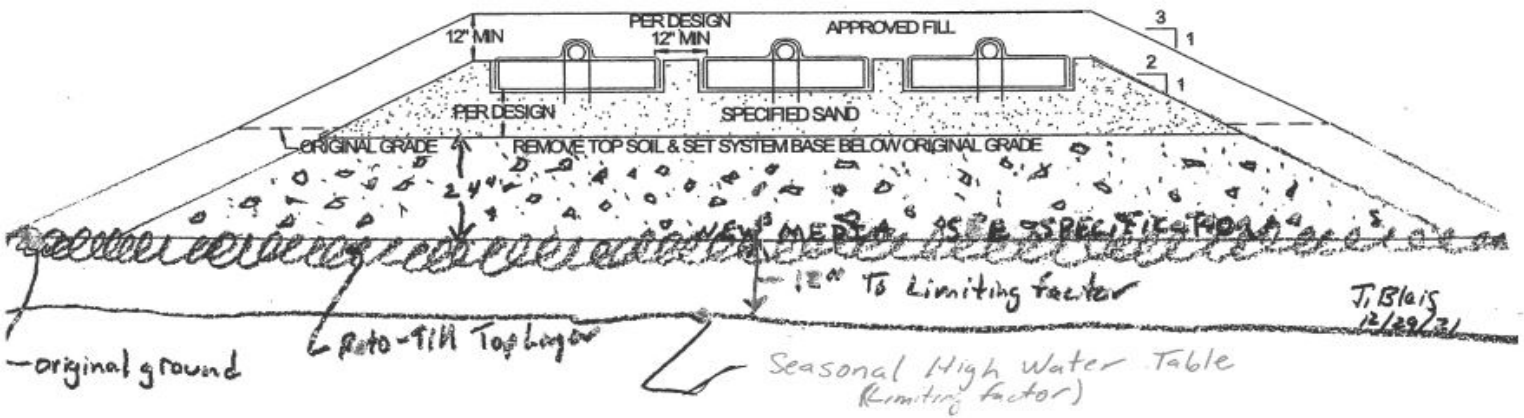
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New Soil Media Specification

Upper Fill Layer	
Sieve #	% Passing by Weight
No. 4	75-95
No. 10	60-90
No. 40	35-85
No. 200	20-40
200 (clay size)	<2.0

Lower Fill Layer	
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No. 10	85-100
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No. 60	15-400
No. 200	6-8
200 (clay size)	<2.0

Soil/Septic Field Example
12" to Limiting Factor
Mounding Profile





FOLLOW-UP

Years 2, 4 & 6

How much development occurred?

How many existing sites did we correct?

Types of BMPs implemented

Quantify P, N & NO² trapped in the watershed



Next Steps

Community Conversations: March 2, 2022

Planning Board Workshop: March 8th, 2022

Planning Board Public Hearing: April 12, 2022

Council Reading: April 18, 2022

Council Reading: May 2, 2022