Planning Board Workshop | April 12, 2022
Lake Auburn Watershed Ordinance Updates

Planning, Permitting & Code

auburnmaine.gov

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)

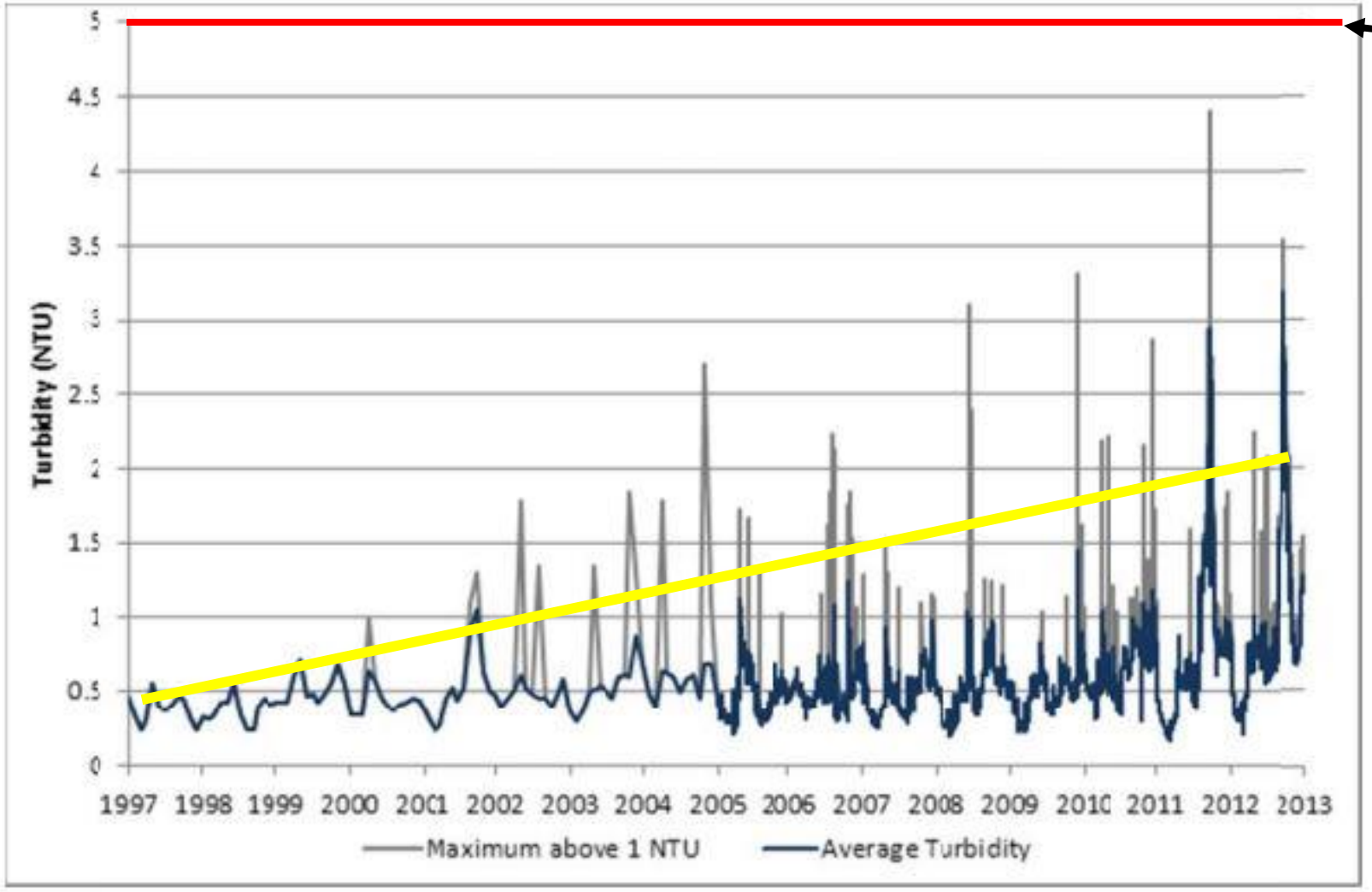
auburnmaine.gov

Proposed Changes Highlights

- **Allow for disposal fields for limiting factor of 12”**
- **Require all systems new or replacement be required to follow new disposal field guidelines.**
- **Require systems to have curtain drain or diversion ditch.**
- **No disposal fields closer than 400 normal high-water mark.**
- **Disposal system needs to installed on the lot or outside the watershed.**
- **Require phosphorus control plan for structures over 200 SF**
- **Require 24” of suitable natural soil or fill material for a total of**

auburnmaine.gov

STATE OF LAKE AUBURN



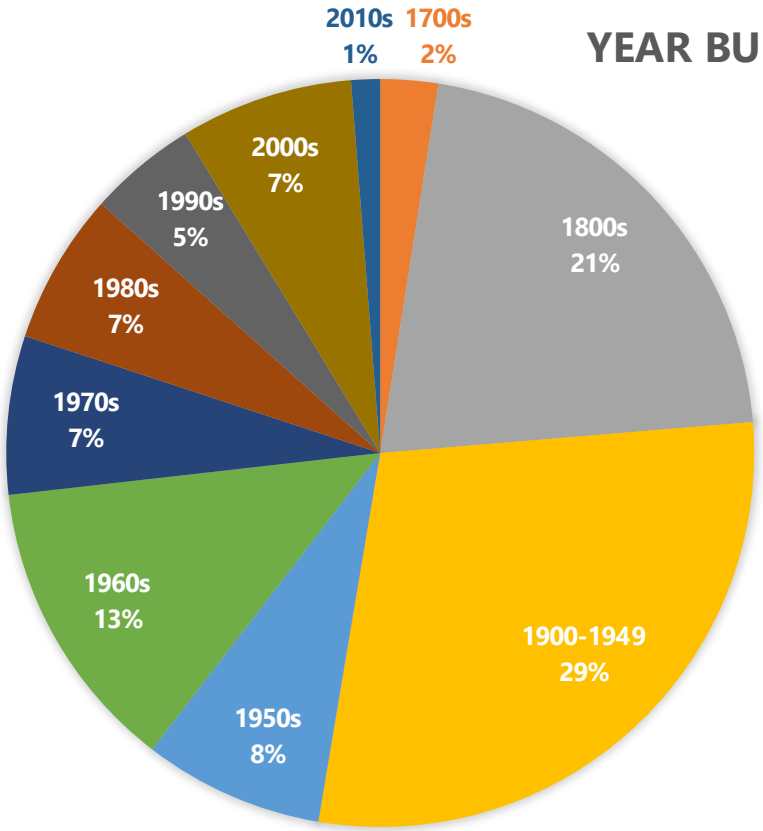
Average and Maximum when above 1 NTU Raw Water Intake Turbidity for 1997 to 2013

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).

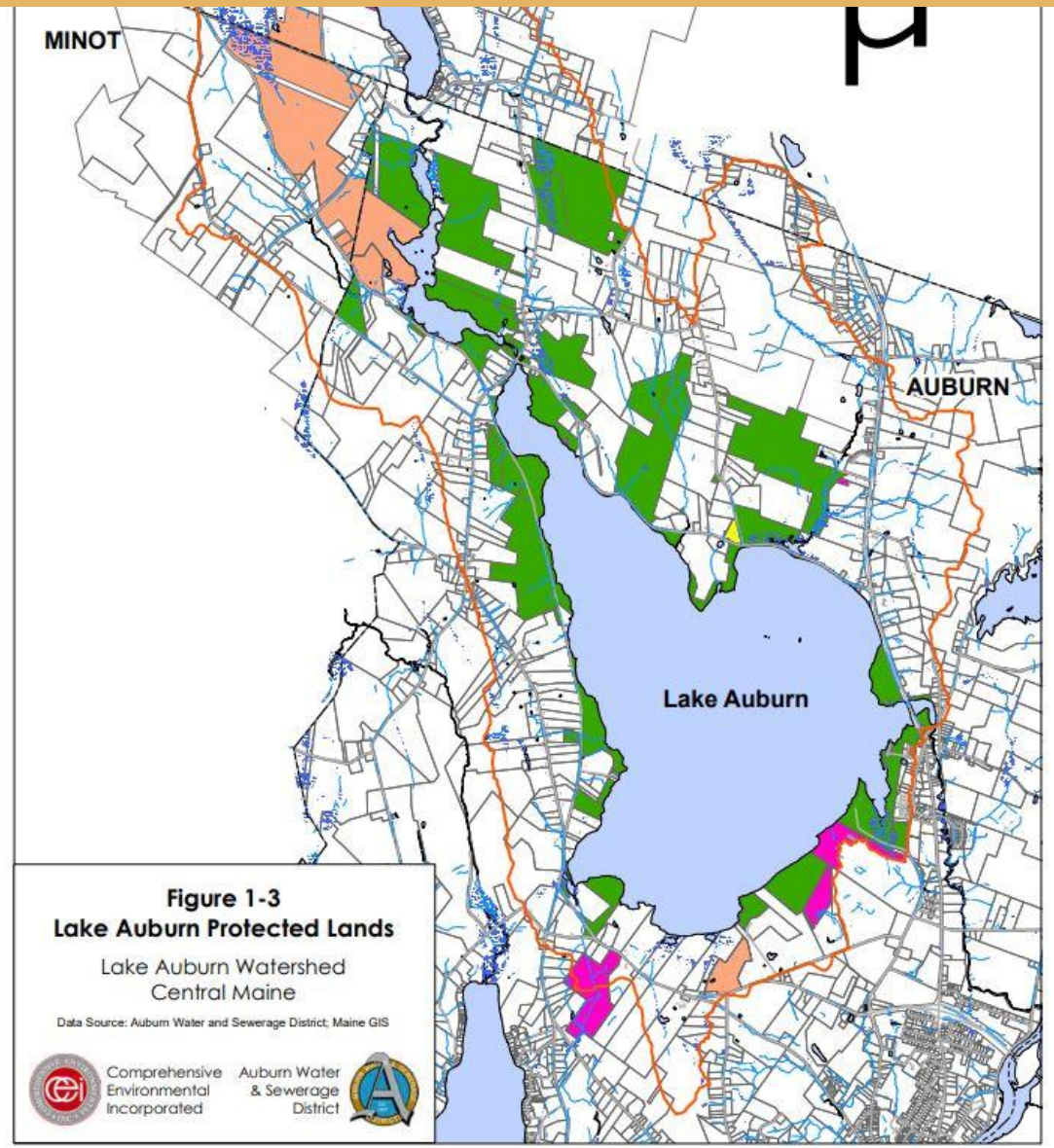
auburnmaine.gov

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 2021Report 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

auburnmaine.gov

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

Additional Considerations by: Comprehensive Plan/Community Conversations and City Council:

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.

3.) Reduction of SF to require a phosphorus control plan from 575 to 200 Square Feet.

4.) Map amendment to include minimum lot size to 3 acres and 1 Dwelling Unit per 3 acres.

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.

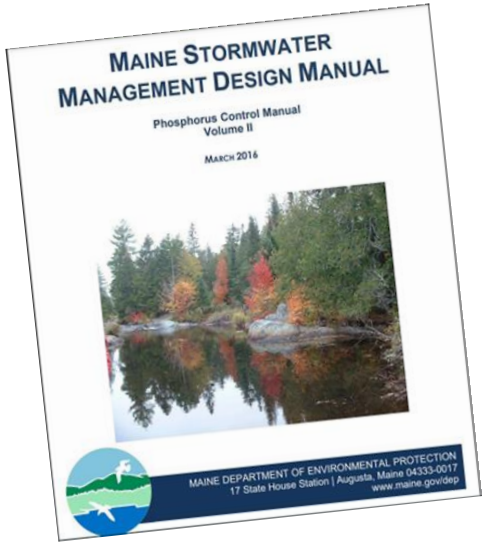
(5) All private sewage disposal systems shall be installed on the lot of the dwelling unit, unless the system can be developed outside the watershed or in under special conditions replacement systems may approve by local plumbing inspector on adjacent lots.

PHOSPHOROUS ORDINANCE SECTION 60-1070 TEXT AMENDMENT

APPROVED by Council on March 21, 2022

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)**

auburnmaine.gov

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

Additional Phosphorus Ordinance Text Amendment Sec. 60-1066

(1) Any new building or structure with more than ~~575~~ 200 square feet of ground floor area.

Further Commits the City of Auburn to Watershed Protection and Water Quality.

auburnmaine.gov

Comprehensive Plan Recommendation

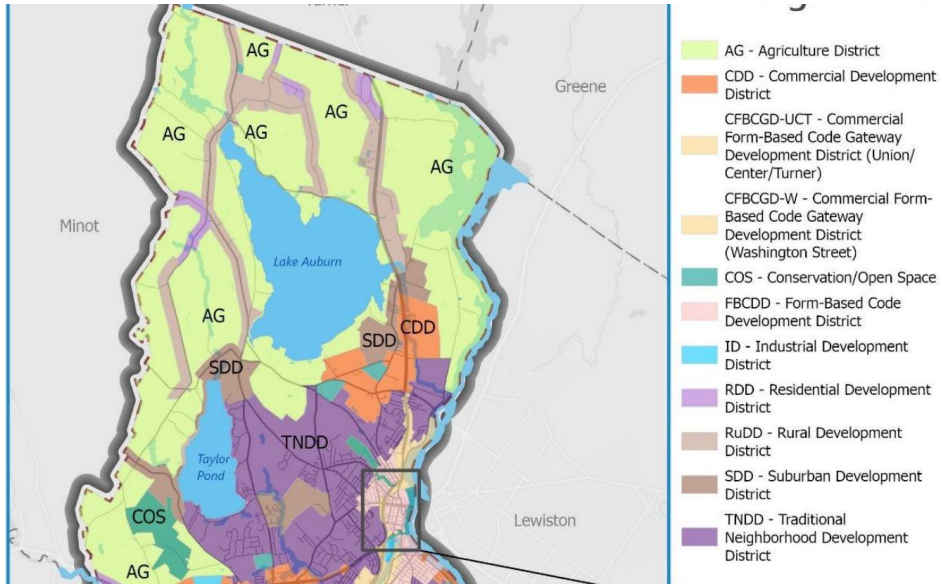
RURAL DEVELOPMENT DISTRICT (RD)

Objective – Allow for the development of residential uses (primarily detached single family homes) at a density of up to 1 unit per 3 acres with one additional dwelling unit permitted for each home in areas where public/community sewerage and water are not available and not likely to be available in the foreseeable future. New development should be designed to minimize the number of vehicular access points to existing collector and other through roads. Shared driveways should be encouraged by providing for a 50-foot driveway frontage bonus. Setbacks within lots should be maintained.

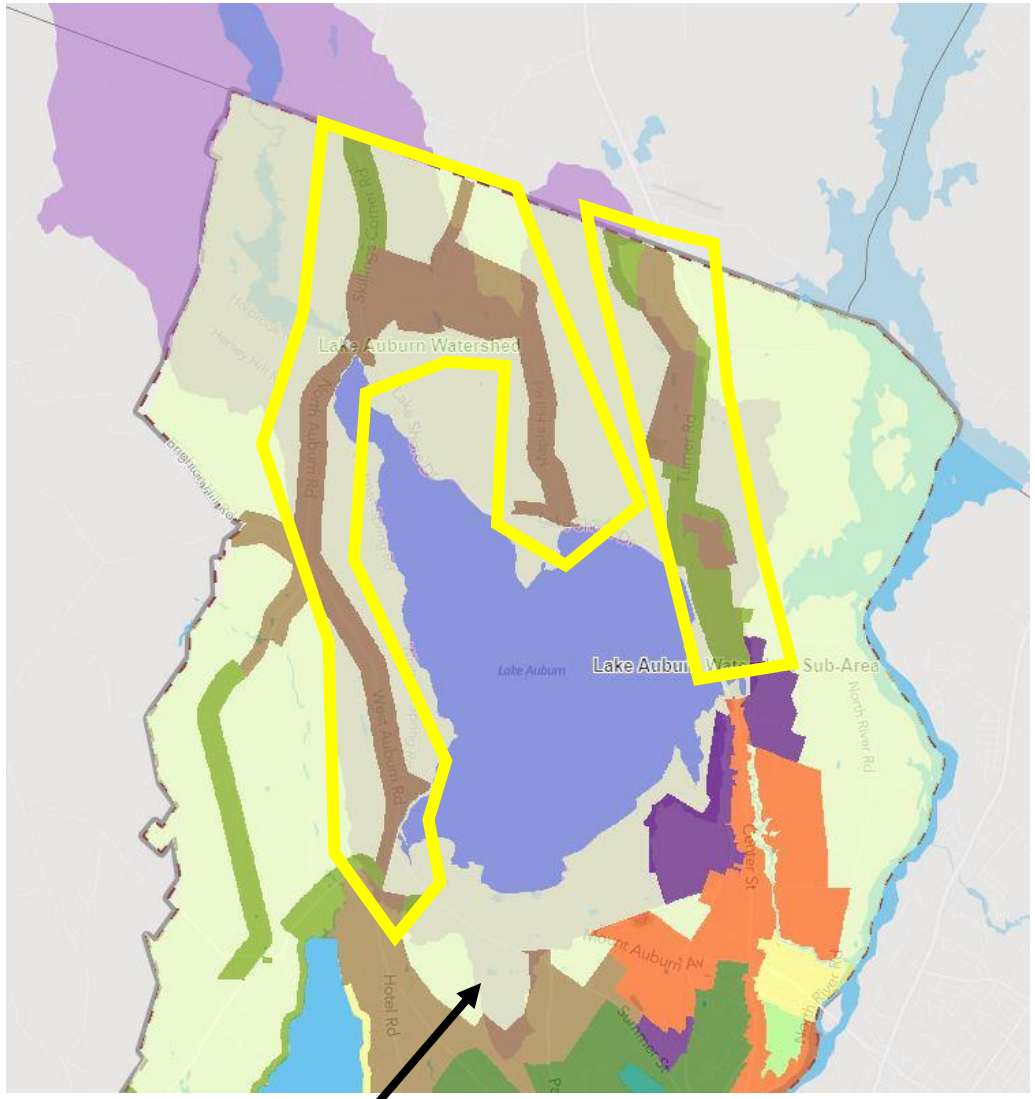
Allowed Uses – The Rural Development district generally follows the boundaries of the Low-Density Country Residential Zoning District, in effect at the time of the 2021 Comprehensive Plan update (see appendix IV). The following general types of uses should be allowed within the Rural Development District:

- Low Density Residential Dwellings
- Home occupations
- Community services and government uses
- Agriculture
- Small retail shops less than 3,000 square feet or 1.5 times the average size of the home within Village Overlay Neighborhoods.

Development Standards – The residential density in the Rural District should be one unit per 3 acres. Lot frontage requirements should be around 200 feet but should be reduced for lots that share driveways. In general, the minimum front setback should be 25 feet. Side and rear setbacks should be 15-25 feet or 25% of the average depth of the lot to establish dimensional standards that relate to the size and width of the lot.



1 Unit per 3 Acres (minimum lot size: 3 Acres)



Watershed Boundary

Proposed Map Amendment

auburnmaine.gov

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

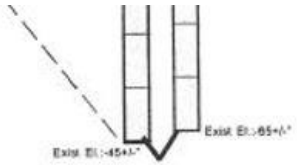
Upper Fill Layer	
Sieve #	% Passing by Weight
No. 4	75-95
No. 10	60-90
No. 40	35-85
No. 200	20-40
200 (clay size)	<2.0

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+/- "

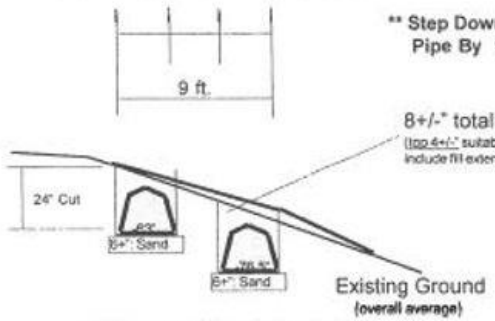
ELEVATION REFERENCE POINT
Location & Description top of bottom step
Reference Elevation is: 0.0" or:

DISPOSAL AREA CROSS SECTION

3 ft. Chambers w/ 3 ft. Spacing

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

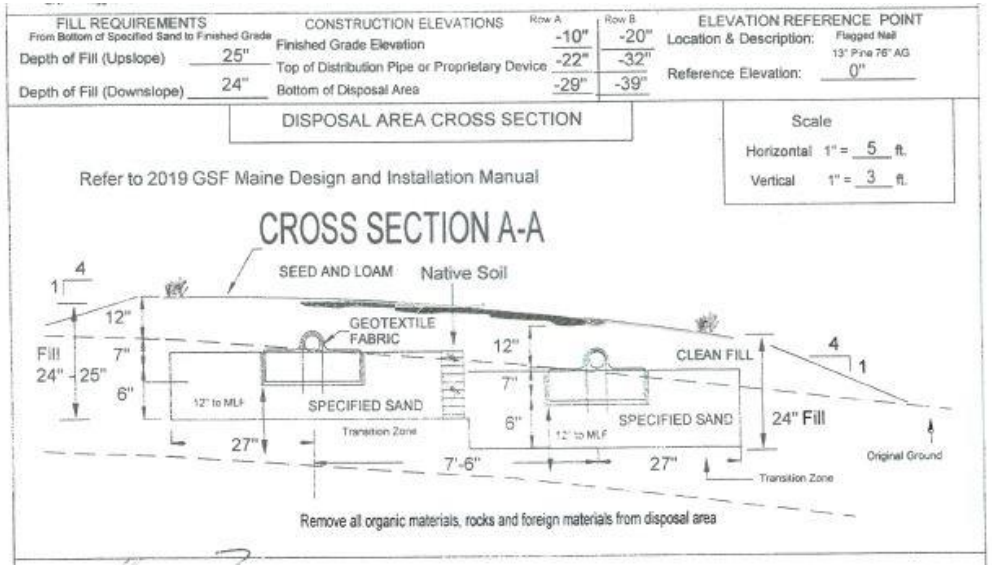
Construction Notes:
1. General Installation procedure shall follow RULES Manual, section 11. Available from State. call: (207) 287 5689.
2. Beneath & around chambers: use 6"+ coarse sand. Mix same into the surface of unexcavated soil for an interface transitional zone.
3. Fill above chambers can be on-site soils or coarser material.
4. Inspection &/or an "Affidavit" of Site Preparation may be required by LPI prior to installaion.

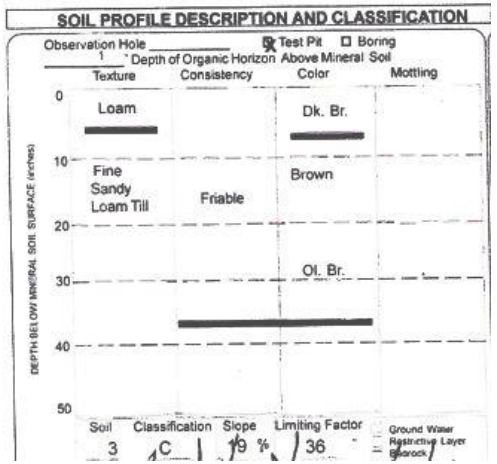


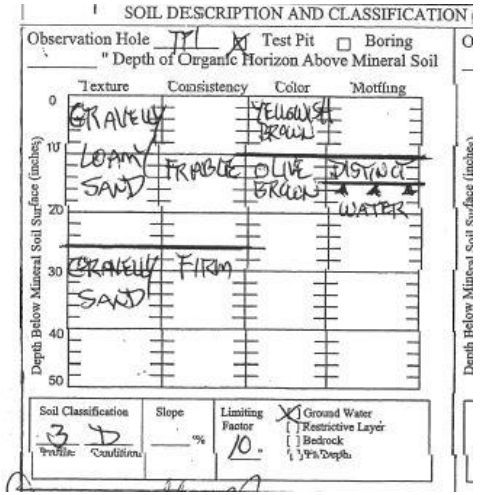
** Step Down Connection Pipe By 13.5" Each

8+/-" total cover over Devices
(top 4+/-" suitable for Grass Growth, Sect 604.2.6. include fill extensions)

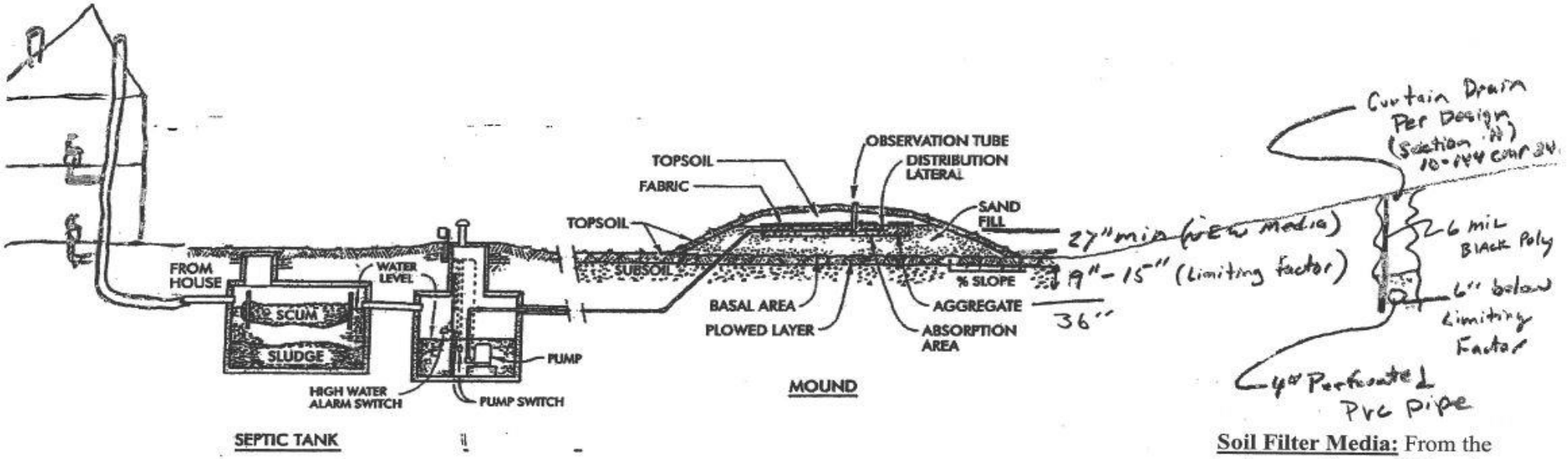
3' Plastic Chambers

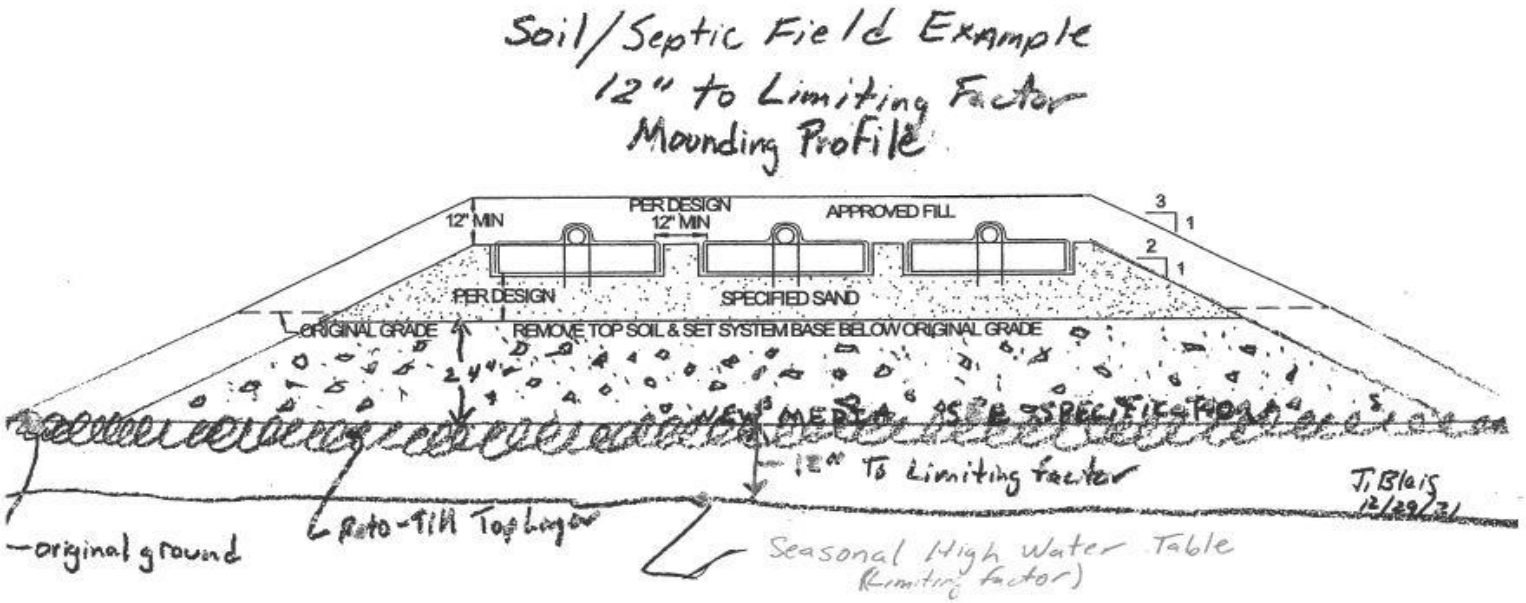






auburnmaine.gov





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

- **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**

auburnmaine.gov

FOLLOW-UP

Years 2, 4 & 6

How much development occurred?

How many existing sites did we correct?

Types of BMPs implemented

Quantify P, N & NO^2 trapped in the watershed

auburnmaine.gov

Next Steps

Community Conversations: February 16 & March 2 , 2022

Planning Board Workshop: April 12th, 2022

Planning Board Public Hearing: April 12, 2022

Council Reading: April 18, 2022

Council Reading: May 2, 2022