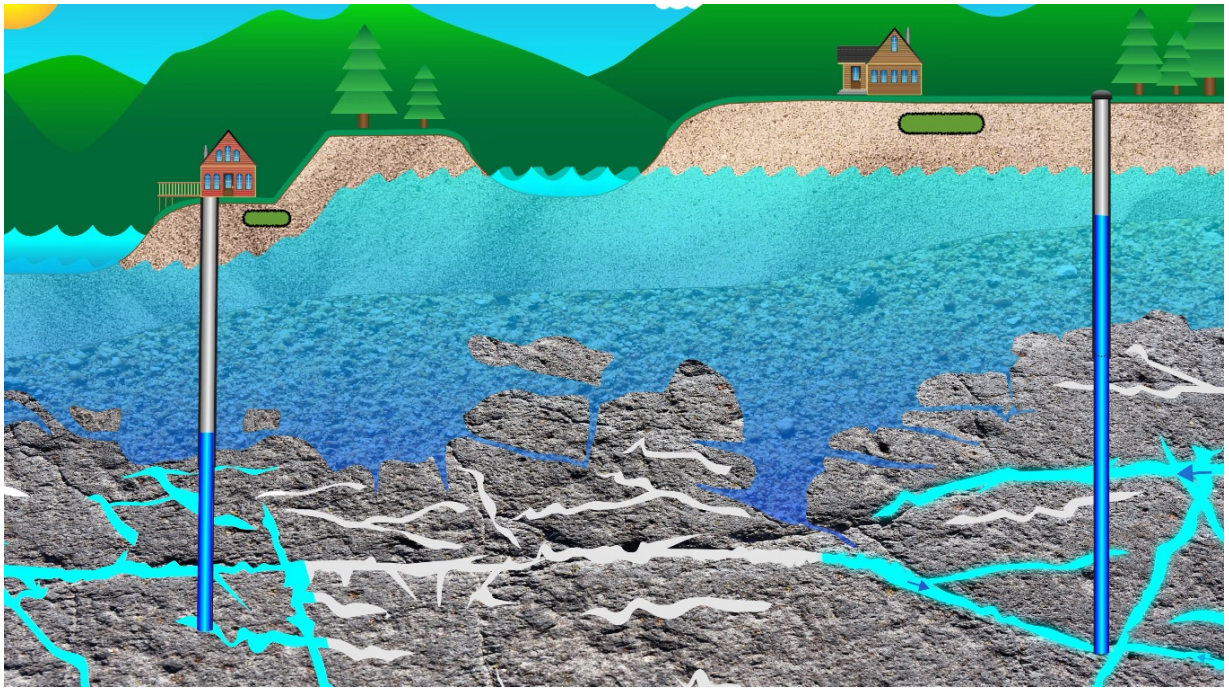
Wells and Septic Location Updates

4/16/2024 - GSOWA

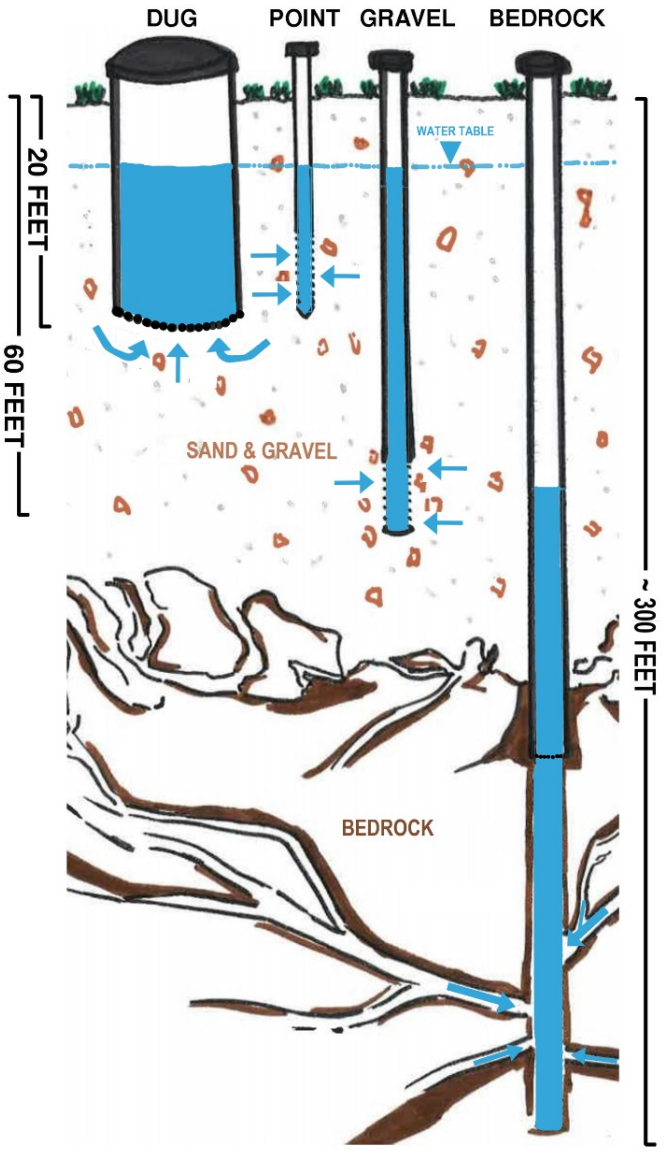


Abigail Fopiano, P.G.
Hydrogeologist / Owner

EDGEWATER STRATEGIES
CLEAR SOLUTIONS

Groundwater Withdrawal Permitting – Public Water System Management – Shoreline Permitting – Public Outreach

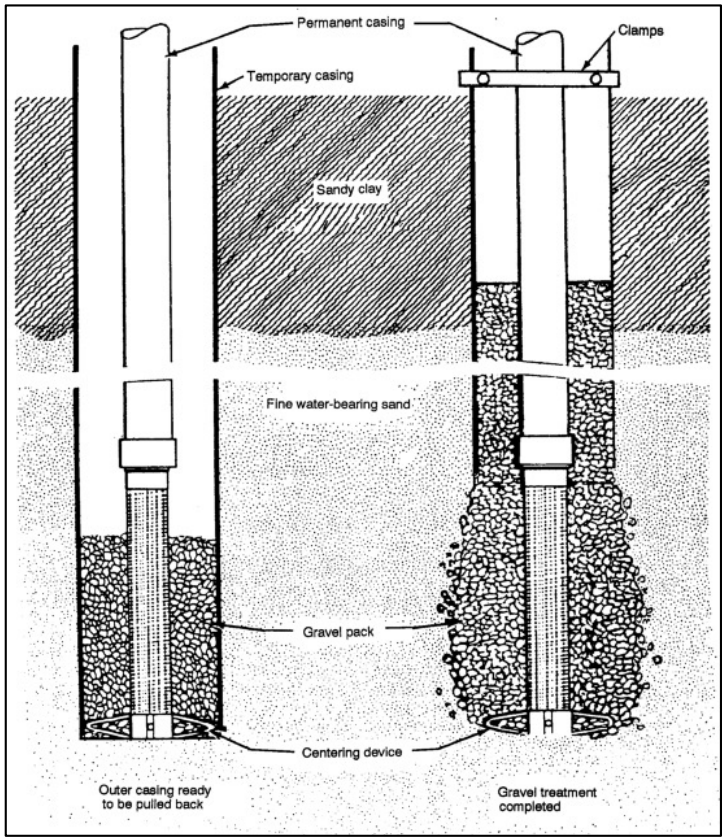
Groundwater Flow to Wells



Well Basics – Overburden Wells

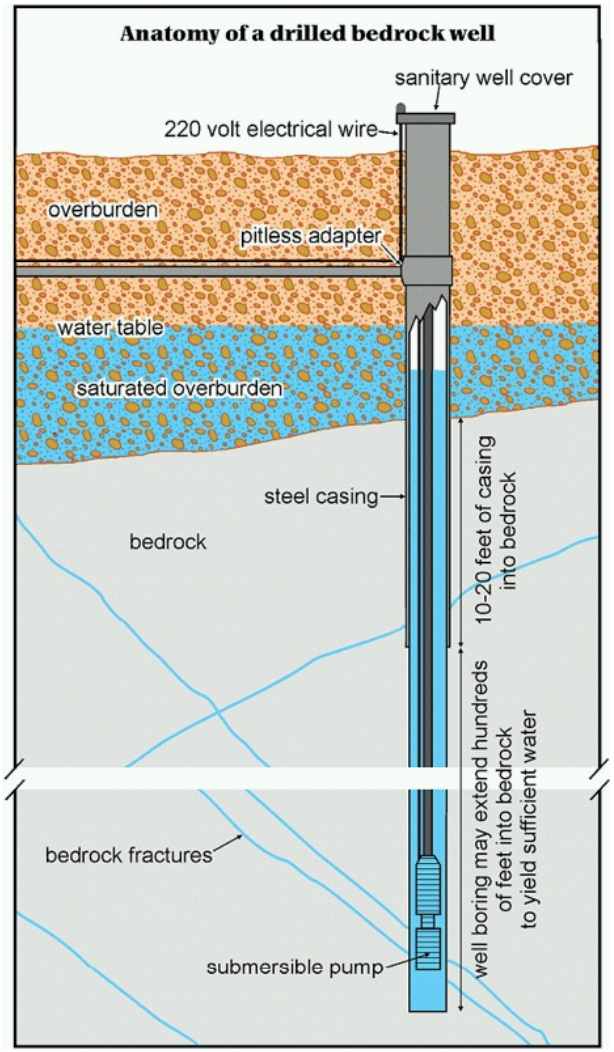
Sand and Gravel Wells – gravel of naturally packed, water flow through screen

Dug wells and Springs (<5% of Private Wells)



Well Basics – Bedrock Wells

Bedrock – casing installed into competent rock, water flow trough fractures



What happens underground?

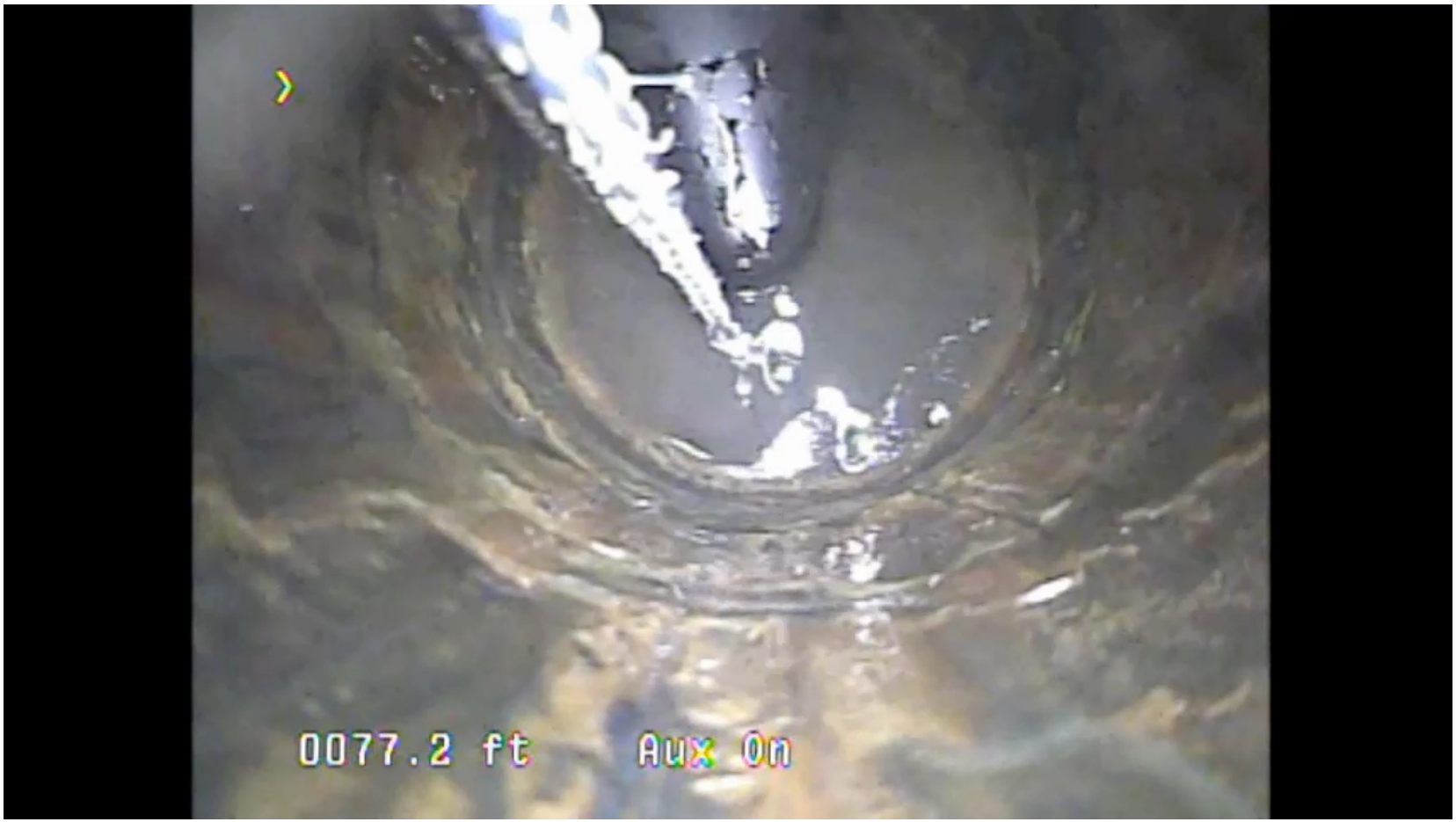
Proper Well Construction

- Select well type/drilling method
- Hire a licensed water well contractor and
- Hire a licensed pump installer
- Install casing
  - At least 10 feet into competent rock
- Install screen
- Grout well (sanitary seal)
  - Required for Public Supplies
  - Required when setbacks are not met
- Develop well
  - **Maximize specific capacity**

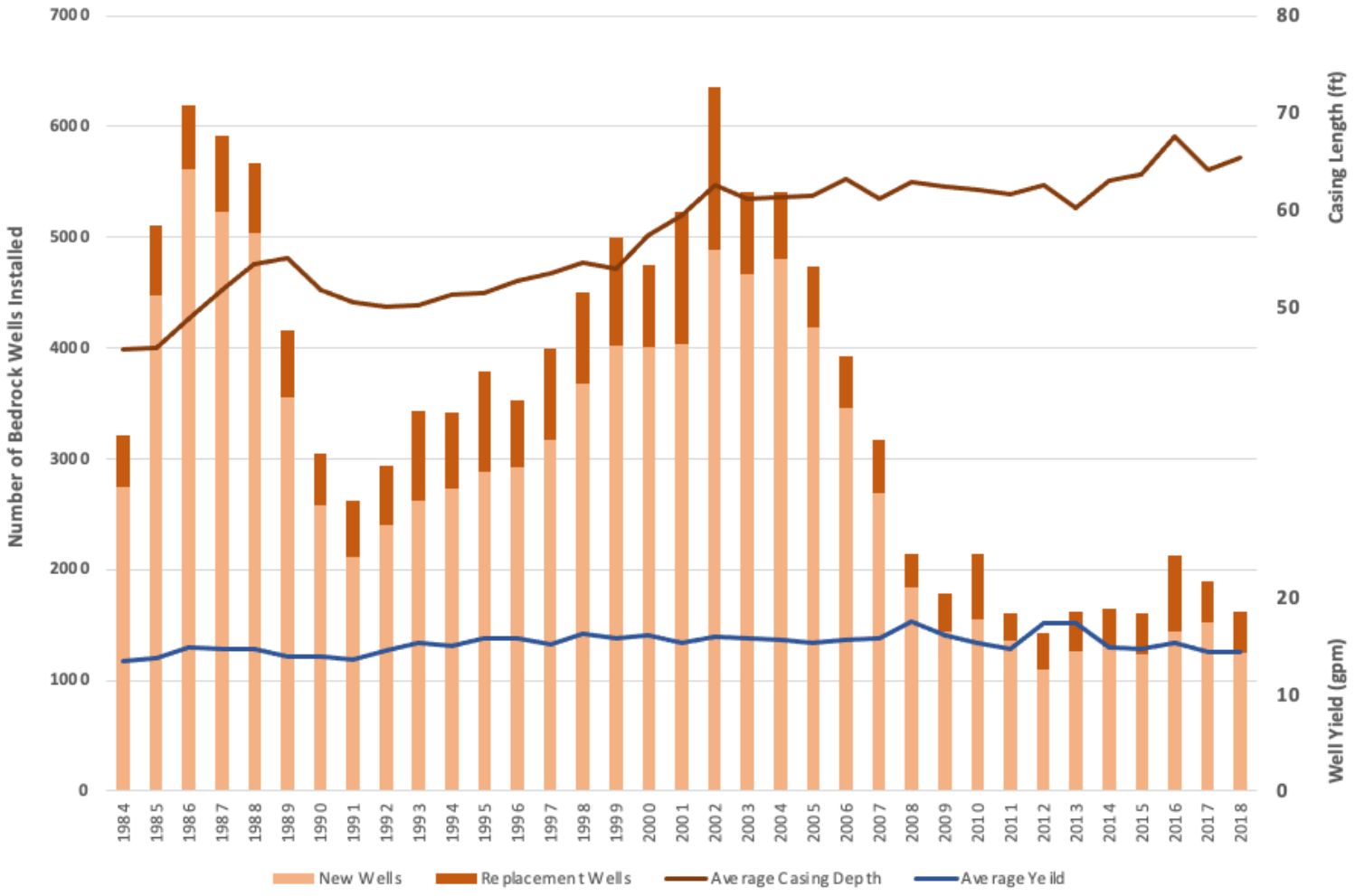
Take note of alterations to well casings after installation!
(seals, extensions, drains)

Yield Rating A Well

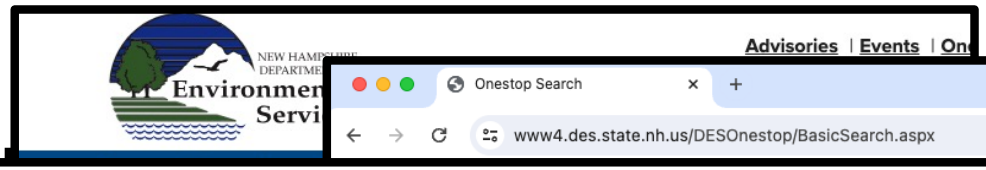
Proper Construction of a Well



Number of Bedrock Wells Installed per Year
Trends in Casing Depth and Well Yield



NEW HAMPSHIRE DEPARTMENT OF Environmental Services



Onestop Search

www4.des.state.nh.us/DESOnestop/BasicSearch.aspx

OneStop - Search Results

Document R

New Search

Save Results

Total rows found: 447

Display 10 results per page

Sort By:

OneStop - Water Well

Document Retrieval Problems? Learn More

First Prev Next Last

Save Results | Well Driller | Request Sample Containers | Program Info | Program Contact | Water Well Board | Water Well Contractors Search

If you have any questions about or corrections to the information below, please contact us. Click the Program Contact button above for contact information.

Well Id (WRB#):	189.0240	Date Completed:	07/21/1998
Name and Location:	A. BLAIS 565 THIRD RANGE RD PEMBROKE	Total Depth:	400 FT
		Depth to Bedrock:	27 FT
Tax Map No:		Casing:	40 FT
Lot No:		Tested Yield:	6 GAL/MIN
Type:	DRILLED IN BEDROCK	Static Water Level:	20 FT
Use:	DOMESTIC	Measured Yield After Development:	

Well Driller

Document Retrieval Problems? Learn More

Driller License No:	522	Driller Well Id:	353
Name and Address:	DIGGER DAY'S ARTESIAN WELL COMPANY INC 63 CROSS RD CONTOOCOOK NH 03229	Current License Status:	INACTIVE
Email:		Phone Number:	603-746-3568

DES DWGB PWS Regulations

Public Water Supplies (PWS)

SANITARY PROTECTIVE RADIUS
Dependent on System Design Capacity
Majority of small PWSs are on septic systems

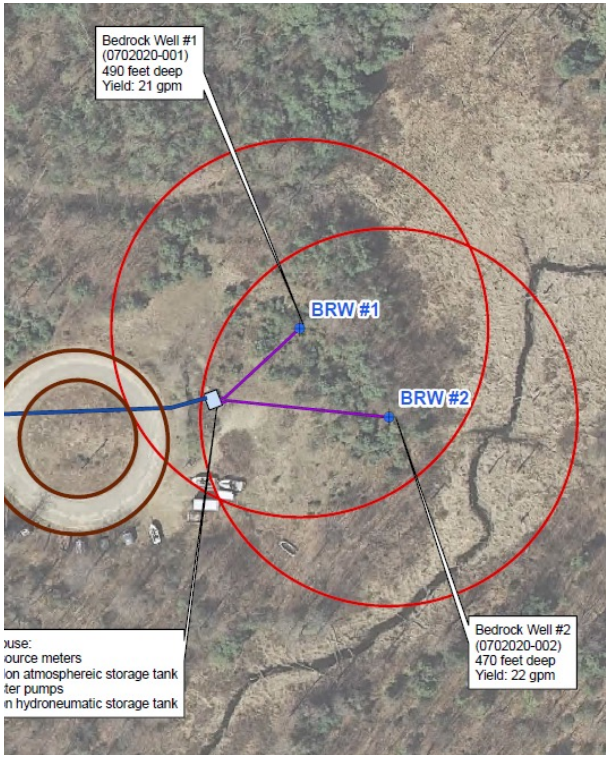


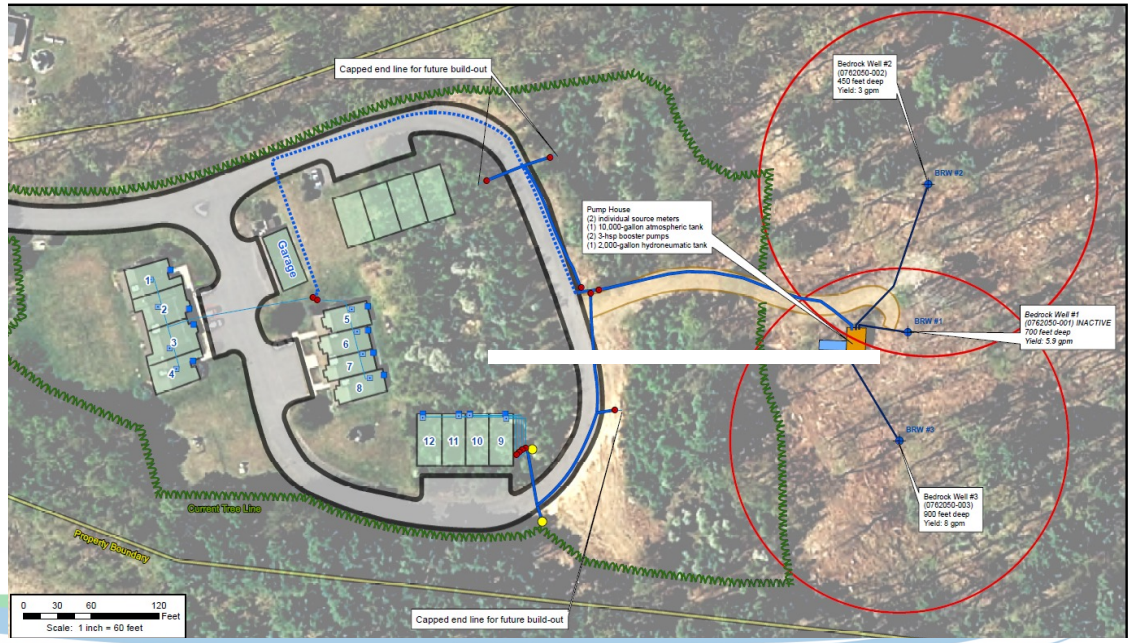
Table 302-1 Sanitary Protective Area Radii

Permitted Production Volume (gallons in a 24-hour period)	Radius
less than 14,400	150 feet
14,401 to 28,800	175 feet
28,801 to 57,599	200 feet
57,600 to 86,400	250 feet
86,401 to 115,200	300 feet
115,201 to 144,000	350 feet
greater than 144,000	400 feet

Public Water Systems

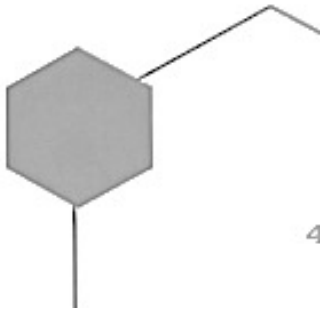
50% NH Residents on PWSs
Regulated by EPA / NH DES
Required to provide water that is safe to drink
Required to provide water at an adequate pressure.
Public information
25 persons or 15 connections
2 bedrooms / home (2.5 people/bedroom). 1 bedroom home (1.5 persons)
Community / Non Community / Transient / Non-Transient
Larger well radius, different pump design standards

NEW HAMPSHIRE DEPARTMENT OF Environmental Services



House Bill 247 (HB247) – Wells, Well Releases

- Standard Well Release Prepared by Designer → Setback Reduction Form Prepared by Water Well Contractor
- Residential protective well radius ends at the property line.
- Encroachment Waiver is gone.
- New well location at ISDS inspection → Amended Plan.
- New well location after ISDS inspection → No Amended Plan.
- **Wells still need to meet ISDS setbacks.**
- **Commercial well radius stays on property or needs easement.**



The Water Well Board Regulations

Private Wells

75- Foot separation from septic systems

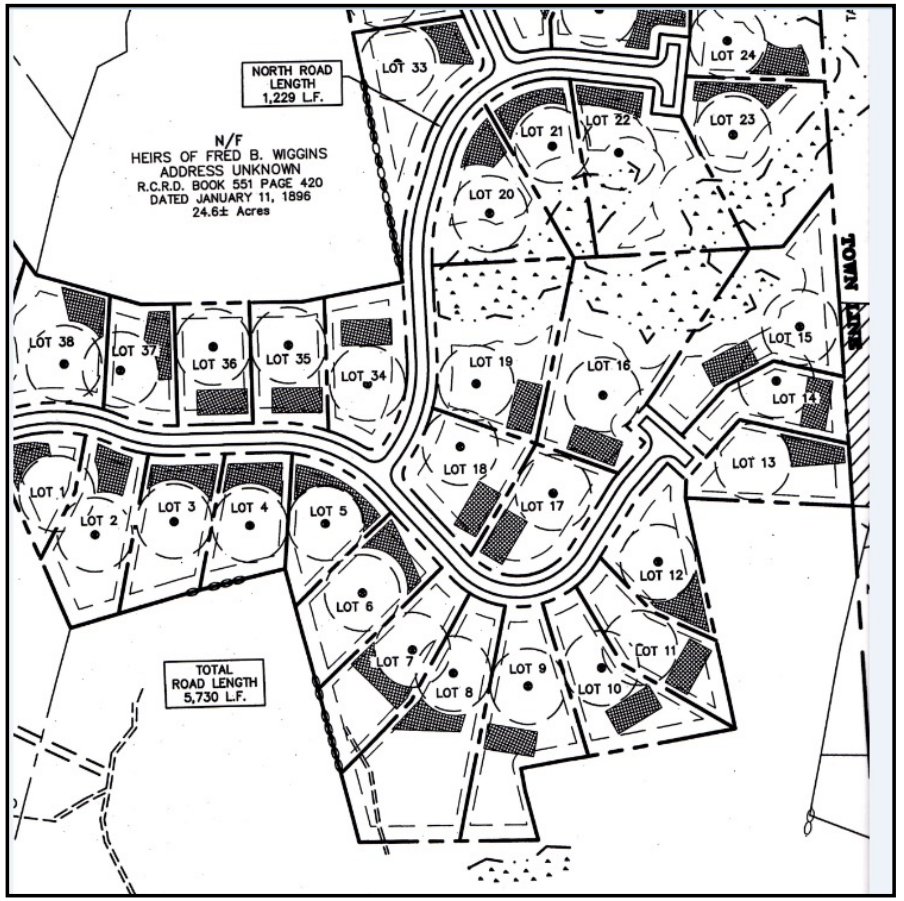
150-gallons per day per bedroom

Irrigation uses often double domestic uses

Other well setbacks

Special methods of construction

Retro-fit existing wells.



The WWB Regulations

RESIDENTIAL DRINKING WATER WELL LOCATION SETBACKS	
Entity	**Setback (ft.)**
Effluent Disposal Area (leach field/bed)	75[1]
Septic Tank	75[2]
Property Boundary	75
Livestock Pen	75 (100 for dug wells)
Automobile Salvage Yard	75
Underground Storage Tanks (containing gas or diesel fuel)	250
Storage of Regulated Substance (except gas or diesel fuel)	75
Solid Waste Disposal Site	75
Bulk Storage of Material (ex. fertilizer, manure, salt)	75
Stump Dump	75[3]
State Highway Right-of-Way	50[4]
Sewer Component	50[5]
Surface Water / Swamp	50[6]
Public Road Surface	75[7]
Other Sources of Contamination	75

Notes:

[1] NHDES site visit and approval required for wells within 25 feet of an effluent disposal area.

[2] Setback can be 50 feet if SDR 26 pipe is used and the tank is plastic or coated with a sealant to prevent infiltration and exfiltration.

[3] The burial of on-site tree stumps is not considered solid waste if greater than 75 feet from a well. As such, wells must be 75 feet from stump burial sites.

[4] A well that is constructed within 50 feet from a state highway right-of-way or in a location that does not allow or provide for adequate surface drainage is not eligible for DOTs well replacement program.

[5] Under certain conditions the distance to septic system components to water supply lines may less than 50 feet. Contact NHDES for site-specific information.

[6] 50-foot setback required from all surface waters including inundated wetlands, bogs, and swamps.

[7] Setback reduction requirements must be followed if a road surface is within 75 feet of the well.

We 602.07 Well Location: Setbacks from Septic Systems.

(a) For purposes of this section, the setback distance from any septic system effluent disposal area or septic tank shall be determined in accordance with Table 1008-4 in Env-Wq 1008.06(b); as reprinted below in Appendix C.

(b) A well shall be located no less than 75 feet from an effluent disposal area or tank of a septic system having a design flow of up to 750 gallons per day.

(c) The setback to a septic tank specified in (b), above, may be reduced to 50 feet if the soil line is SDR 26 or its equivalent and the tank is sealed and grouted.

(d) A water well contractor shall determine the location of existing septic tanks and effluent disposal areas. If the location of existing septic tanks and effluent disposal areas cannot be determined visually, the water well contractor may reasonably rely on information provided by the property owner.

We 602.12 Well Location: State Approved Septic Plans.

(a) Prior to constructing a new well on a lot on which a septic system is proposed or has been constructed, a water well contractor shall review the state-approved septic plan to confirm the approved well location.

(b) For any new well on a lot on which a septic system is proposed or has been constructed, a water well contractor shall install the well in the location shown on the state approved septic plan.

(c) If a well cannot be installed in the location shown on the approved plan, a water well contractor shall consult with the property owner, or the property owner's agent, to determine an acceptable location for the well, and construct the well in an alternate location in accordance with RSA 485-A:30-b, and We 602.06 through We 602.15.

(d) For lots with site conditions requiring a critical well location, as defined in We 101.11, the following criteria shall apply:

(1) If the well cannot be installed in the location shown on the approved plan, the water well contractor shall consult with the permitted designer of the individual sewage disposal system and property owner, or the property owner's agent, to determine an acceptable location for the well; and

(2) The water well contractor shall not construct the well in an alternate location prior to the issuance by the department of an approved amended plan, pursuant to RSA 485-A:29 and Env-Wq 1003.14(b).

The WWB Regulations

Bedrock well installations that do not meet setbacks – For bedrock wells proposed to be installed on a property where setbacks cannot be met, and *all* efforts to meet the setbacks are not practicable, the well is to be installed one of the following ways:

OBTAIN SETBACK REDUCTION FORM:

1. **Obtain a written acknowledgement** from the property owner using the Setback Reduction Form and submit with the Well Completion Report.
2. Install no less than 40 feet of casing, with no less than 10 feet into competent rock.
3. Seal the annular space outside of the well casing with *grout* material.

Note: The Setback Reduction Form is not the Well Release Form required in the septic system approval process.

OR

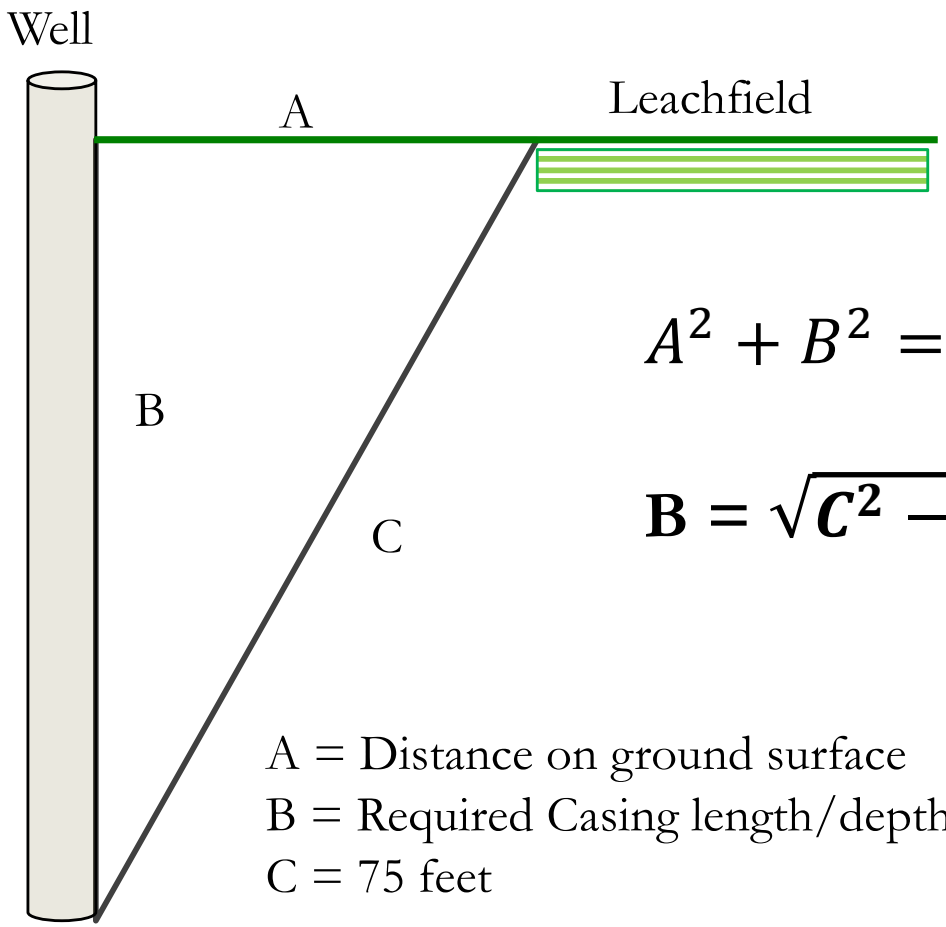
USE SPECIAL METHODS OF CONSTRUCTION:

1. Inform the homeowner that setbacks are not met and the risks involved.
2. **Install a minimum casing length** per the tables defined in the We 600 rules (shown below, derived from the Pythagorean Theorem). The minimum casing length is from ground surface.
3. Seal the annular space outside of the well casing with *grout* material.

Minimum Casing Length (from ground surface) Where a 75-foot Setback is Required	
Horizontal Setback (ft.)	Minimum Casing Length (ft.)
75 or greater	20
70-74	27
65-69	37
60-64	45
55-59	51
50-54	56
45-49	60
40-44	63
35-39	66
30-34	69
25*-29	71
*NHDES must inspect any proposed well location within 25 feet of a septic system.	

Special Methods of Construction

Pythagorean Theorem



$$A^2 + B^2 = C^2$$

$$\mathbf{B = \sqrt{C^2 - A^2}}$$

A = Distance on ground surface
B = Required Casing length/depth
C = 75 feet

Minimum Casing Length (from ground surface) Where a 75-foot Setback is Required	
Horizontal Setback (ft.)	Minimum Casing Length (ft.)
75 or greater	20
70-74	27
65-69	37
60-64	45
55-59	51
50-54	56
45-49	60
40-44	63
35-39	66
30-34	69
25*-29	71
*NHDES must inspect any proposed well location within 25 feet of a septic system.	

Table 602-2 Minimum Casing Length Where a 50-foot Setback is Required

Horizontal Setback (ft.)	Minimum Length of Casing (ft.)
50 or greater	20
45-49	22
40-44	30
35-39	36
30-34	40
25-29	43

Setback Reduction Form

Non-bedrock wells and/or not enough casing

STATE OF NEW HAMPSHIRE
WATER WELL BOARD
PO Box 95
Concord, NH 03302-0095
(603) 271-1974

Setback Reduction Form
Please Attach Copy to the Well Completion Report

REASON FOR SETBACK REDUCTION (Check appropriate box)

- ☐ The property size is not sufficient to allow for the required setback;
- ☐ Sufficient setbacks from other potential sources of contamination cannot be met;
- ☐ Excessive slopes prohibit access;
- ☐ The location of permanent structures would result in unreasonable impacts or damage to the structures;
- ☐ The location of lakes, ponds, streams or wetlands prohibits meeting the required setbacks;
- ☐ The presence of bedrock at or within four vertical feet of the surface would result in unreasonable offset trenching requirements; or
- ☐ Other (Explain) _____

ADDITIONAL CONSTRUCTION METHODS USED (Check appropriate boxes)

- ☐ Extra casing installed into bedrock: Casing depth _____ Depth to bedrock _____
- ☐ Casing annulus grouted with bentonite grout; Other grout _____
- ☐ Additional well seals:
  - ☐ Jaswell type; Depth setting _____feet below land surface; ☐ Annulus grouted
  - ☐ Shale packer; Depth setting _____feet below land surface; ☐ Annulus grouted
  - ☐ Other (Explain): _____
- ☐ Other Construction Methods: _____

SETBACK DISTANCES

Setback to on-site septic system leach field _____ ft.; Septic tank _____ ft.
Setback to off-site septic system leach field _____ ft.; Septic tank _____ ft.
Setback to property line(s)_____ft.
Setback to other potential observed source(s) of contamination_____ft.

Setback Reduction Form

Non-bedrock wells and/or not enough casing

STATE OF NEW HAMPSHIRE
WATER WELL BOARD
PO Box 95
Concord, NH 03302-0095
(603) 271-1974

Setback Reduction Form

Please Attach Copy to the Well Completion Report

*** * * Property Owners Please Take Notice * * ***

Pursuant to RSA 228:34 Private Water Supplies: property owners who have wells constructed within 50 feet of State Highway rights-of-way, drainage ditches or where the location does not allow or provide for adequate surface drainage, lose the possibility of receiving compensation from the New Hampshire Department of Transportation for damages to their drinking water supply from construction or maintenance operations on the state highway systems.

Setbacks to Property Lines and Septic Systems: RSA 485-A:30-b and State regulations require a 75-foot setback from wells serving homes up to 5 bedrooms, to property lines and septic systems. Where site conditions prevent compliance with the required setback, special methods of construction, in accordance with We 602.14, must be used to protect the water supply. For lots developed after July 1989, a Standard Release form issued by the New Hampshire Department of Environmental Services (NHDES) must also be filed. Please note that reduced setbacks to septic systems are not recommended. For new construction, site plans may **not** be approved by NHDES where wells are located less than 75 feet from septic systems.

The WWB Regulations

IF YOU CAN COMPLY – YOU MUST COMPLY

New Lot development

Drillers must install where shown

Designers – be aware of limitations

*Shoreland lots – well by the water

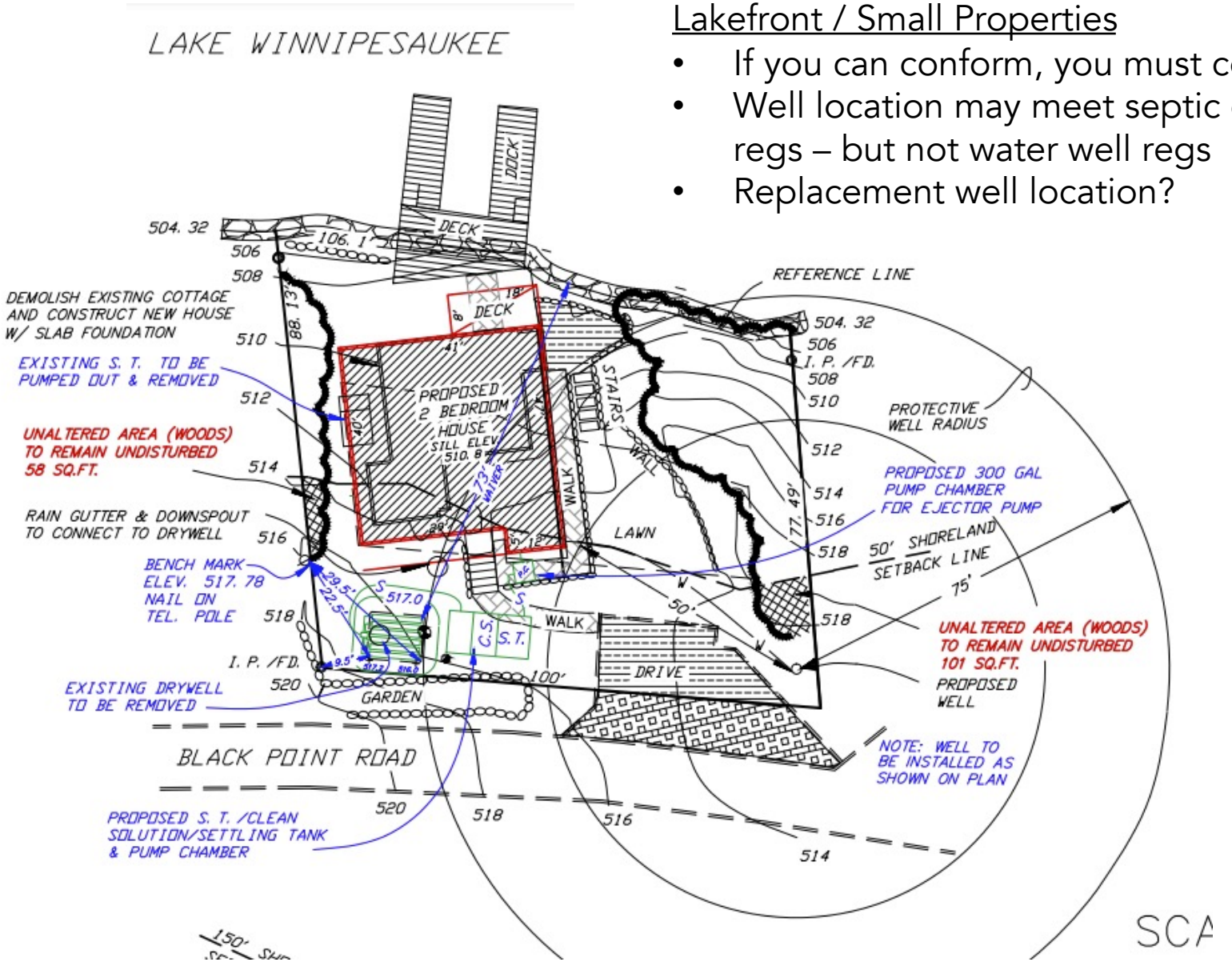
Replacement Wells

Replaced within 5 feet of original well

Replaced elsewhere without septic approval – may not be approvable when septic is replaced

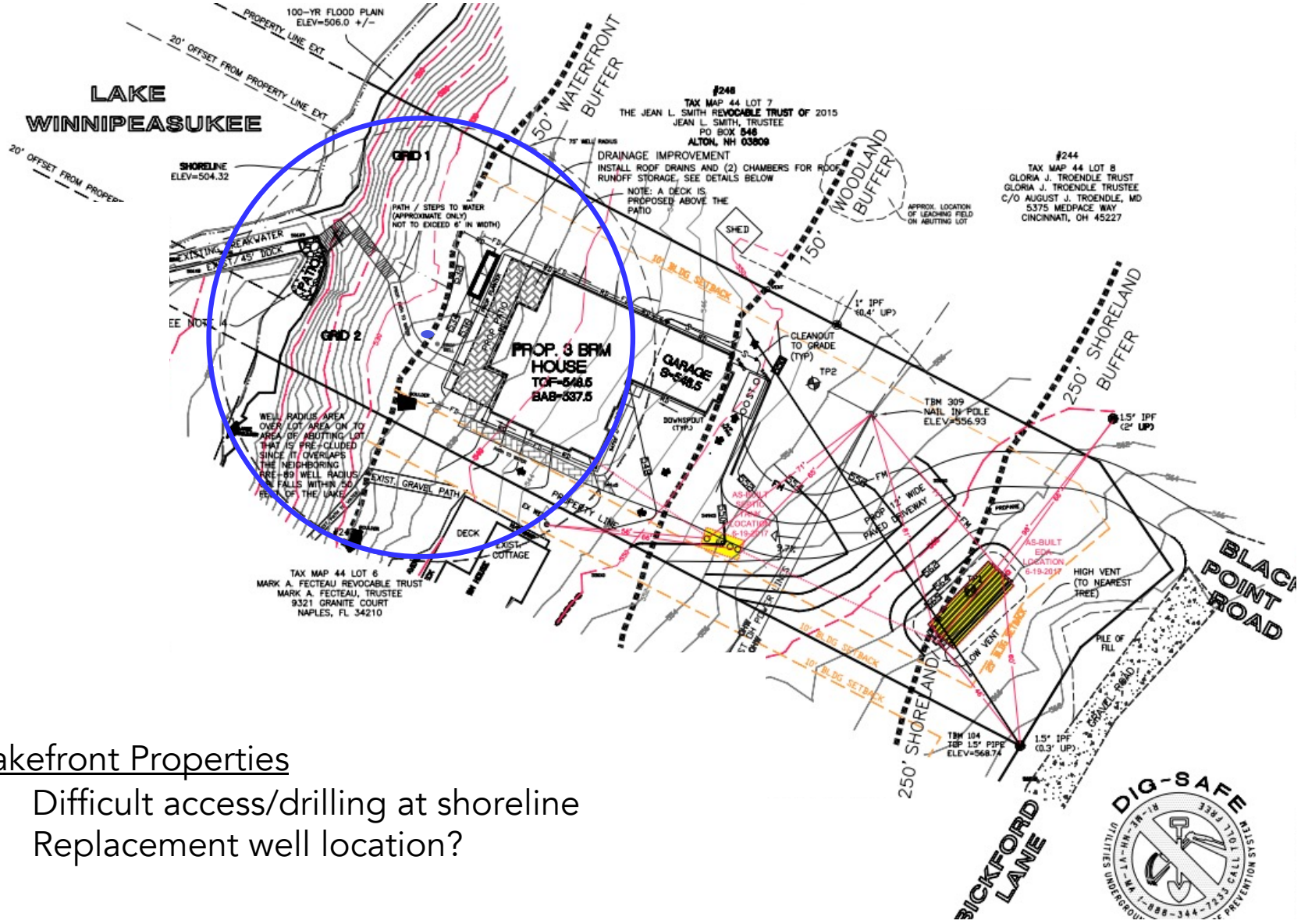
Seasonal Conversion

Get a septic plan with approved location



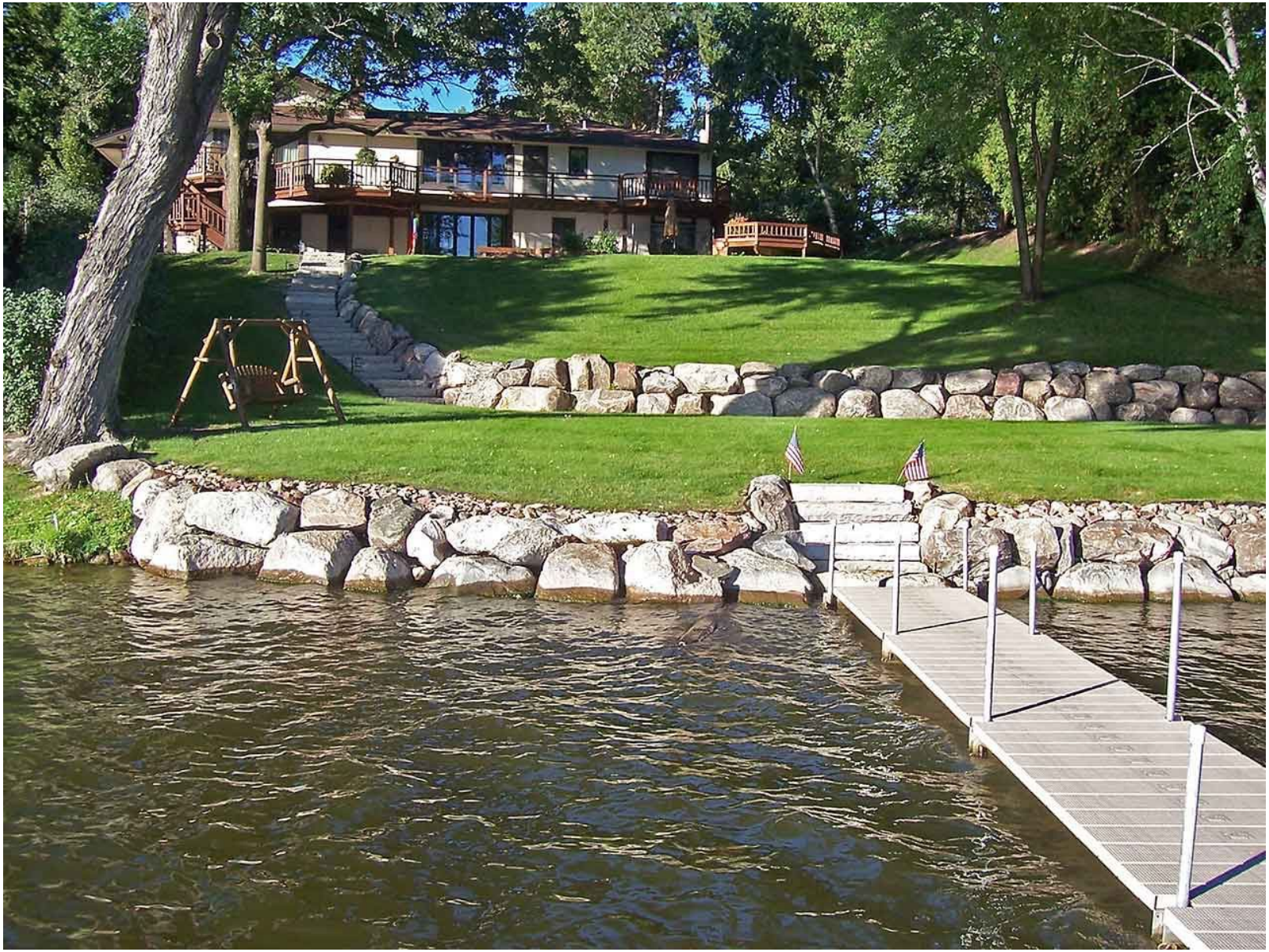
Lakefront / Small Properties

- If you can conform, you must conform
- Well location may meet septic design regs – but not water well regs
- Replacement well location?



Lakefront Properties

- Difficult access/drilling at shoreline
- Replacement well location?



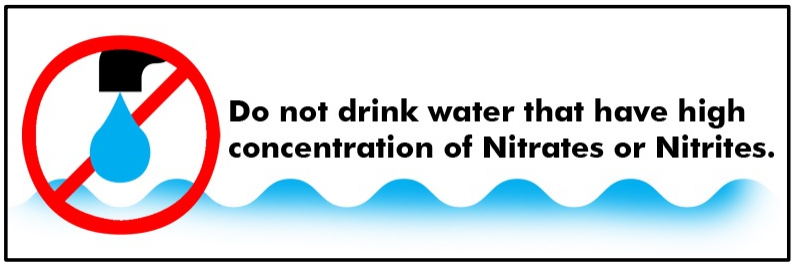
Common Contaminants

Nitrite / Nitrates

Primary DW Standard:

Nitrite 1.0 mg/L

Nitrate 10 mg/L



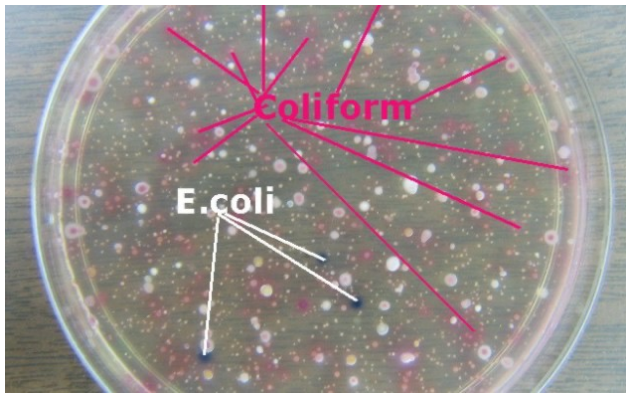
Can remedy through:

- Resolve problem where it enters
  - Inspect septic system/Well
- Well Construction issues
- RO (Reverse Osmosis)
- Boil Water does NOT help

Bacteria: Coliform Bacteria - E.Coli Bacteria

Primary DW Standard:

Absence / Presence



Can remedy through:

- Resolve problem where it enters
- Well Construction issues
- UV light
- Chlorination
- Boil Water (temporary)

195 Center Street, Building C, Auburn, Maine 04210
Phone (207) 784-5354 website www.allaboratory.com

CERTIFICATE OF ANALYSIS FOR DRINKING WATER

DATE PRINTED: 02/07/2024
CLIENT NAME: [redacted]
CLIENT ADDRESS: [redacted]
Otisfield, ME 04270

SAMPLE ID #: 2402-00323-001
SAMPLED BY: Owner

SAMPLE ADDRESS: [redacted]
Otisfield ME 04270
MORE LOC INFO: Kitchen

Legend	
Passes	✓
Fails EPA Primary	⊗
Fails EPA Secondary	▽
Fails State Guideline	✕
Attention	⚠

DATE AND TIME COLLECTED: 02/01/2024 12:00PM
DATE AND TIME RECEIVED: 02/02/2024 09:55AM
ANALYSIS PACKAGE: A & L-IC-Basic-MPN-ME
RECEIPT TEMPERATURE: 13° CELSIUS
CLIENT JOB #:

Test Description	Result	Test Units	Pass /Fail	DQ Flag	RL	Limit	Method	Analyst	Date - Time Analyzed
Calcium	26.9	mg/L			0.1	No Limit	EPA 200.8	DG-NH	02/05/2024 04:45PM
Copper*	2.93	mg/L	⊗		0.005	1.3 mg/L	EPA 200.8	NM-NH	02/06/2024 07:42PM
Hardness (calc.)	77.8	mg CaCO3/L			0.25	No Limit	EPA 200.8	DG-NH	02/05/2024 04:45PM
Iron	<0.1	mg/L	✓		0.1	0.3 mg/L	EPA 200.8	DG-NH	02/05/2024 04:45PM
Magnesium	2.57	mg/L			0.1	No Limit	EPA 200.8	DG-NH	02/05/2024 04:45PM
Manganese*	0.0616	mg/L	▽		0.001	0.05 mg/L	EPA 200.8	DG-NH	02/05/2024 04:45PM
Sodium	153	mg/L			0.5	No limit	EPA 200.8	NM-NH	02/06/2024 07:42PM
Chloride*	→ 279	mg/L	▽		20	250 mg/L	EPA 300.0	TT-ME	02/03/2024 11:02AM
Fluoride*	<0.2	mg/L	✓		0.2	4.0 mg/L	EPA 300.0	TT-ME	02/02/2024 02:48PM
Nitrate as N*	→ 5.10 high	mg/L	✓		0.2	10 mg/L	EPA 300.0	TT-ME	02/02/2024 02:48PM
Nitrite as N*	<0.2	mg/L	✓		0.2	1 mg/L	EPA 300.0	TT-ME	02/02/2024 02:48PM
pH*	6.22	SU	▽	H	--	6.5 - 8.5 SU	SM 4500H+B	TT-ME	02/02/2024 02:04PM
Coliform MPN*	<1	MPN/100mL	✓		1	No Limit	SM 9223 B	TT-ME	02/03/2024 09:00AM
E. coli MPN*	<1	MPN/100mL	✓		1	0	SM 9223 B	TT-ME	02/03/2024 09:00AM

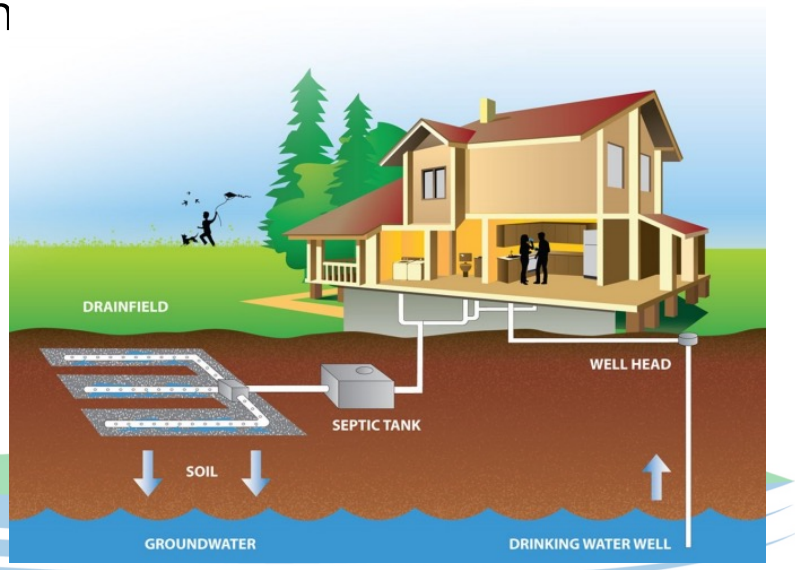
Total Coliform / E.coli Bacteria Preparation (Colilert®-18 Quanti-Tray®) 20th ED SM 9223 B RL-ME 02/02/2024 02:50PM

Closing Thoughts

Reduce the RISK of Contamination

- Understand groundwater flow to wells
- Know potential contamination sources within radius/cone of depression
- Proper construction of well – specifically special methods
- Proper construction and maintenance of septic systems

- Confirm well location on plan is attainable
- Communicate – homeowner – driller- designer - installer
- Be proactive for replacement wells
- Stay up to date on changing regulation



THANK YOU

Abigail Fopiano, P.G.
Hydrogeologist / Owner

EDGEWATER STRATEGIES
CLEAR SOLUTIONS

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(603) 630-1971