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Friendship Area Well Water

with ***Diana Hammer***

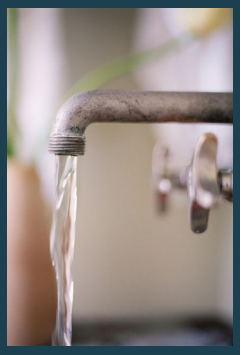
Community, Natural Resource & Economic Development Educator
UW-Extension, Fond du Lac County

Slides & Graphics developed by Kevin Masarik

We teach, learn, lead, & serve, connecting the people with the University of Wisconsin and engaging with them in transforming lives and communities.

This Evening's Agenda

- Water Testing Results
- What To Do Now
- Drinking Water Trivia
- Who Will You Tell?



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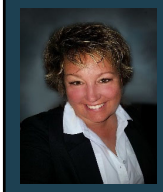
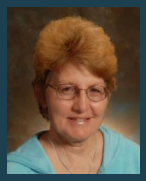
Program Assistants

Nutrition



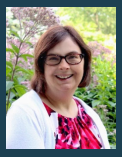
Area Extension Director

Agriculture & Agribusiness



Community Gardens

Family Living



4-H Youth Development

Community Development & Natural Resources

Sampling Results

Bacteria (positive or negative): 62 total tests

62 tests	None detected
4 tests	Positive for coliform
0 tests	Positive for E. coli

BACTERIA (Positive/Negative) for Township 16N R17E

Bacteria	Number	Percent
Coliform Positive	7	9%
Coliform Negative	73	91%
Total:	80	
E. coli Positive	0	0%
E. coli Negative	3	100%
Total:	3	

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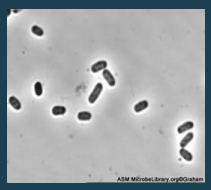
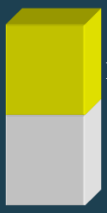
Coliform bacteria

- Coliform bacteria <u>may</u> indicate the presence of more harmful bacteria with similar life cycles.
- Harmful bacteria can cause gastrointestinal disease, cholera, hepatitis
- If any is present assume that the water is unsafe
- Sources:
  - Live in soils and on vegetation
  - Human and animal waste
  - Sampling error

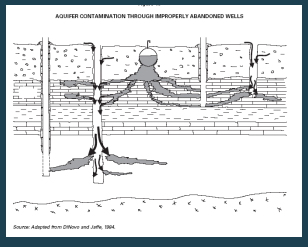




Present =Unsafe

Absent = Safe

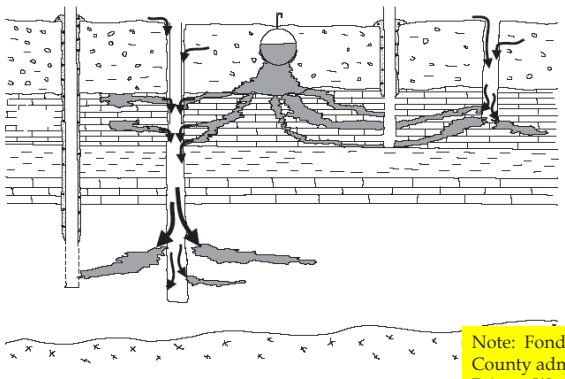
Some Common Pathways for Bacteria to Enter Your Water System



E.coli bacteria

- Type of bacteria found in the intestines of warm-blooded animals and their feces are called E.coli.
- E.coli are often present with harmful bacteria, viruses and parasites that can cause serious gastrointestinal illnesses.
- Any detectable level of E.coli means your water is unsafe to drink.

AQUIFER CONTAMINATION THROUGH IMPROPERLY ABANDONED WELLS



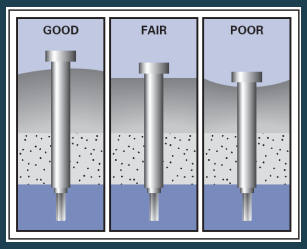
Source: Adapted from DiNovo and Jaffe, 1984.

Note: Fond du Lac County administers the Private Water Systems Ordinance which relates to the abandonment of wells and drill holes.

What should I do if coliform bacteria was present?

1. **Use alternative source of water for drinking**
2. **Retest**
3. **Try to identify any sanitary defects**
   - Loose or non-existent well cap
   - Well construction faults
   - A nearby unused well or pit
   - Inadequate filtration by soil
4. **Disinfect the well**
5. **Retest to ensure well is bacteria free.**

➢ **For reoccurring bacteria problems the best solution may be a new well.**



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Sampling Results

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Bacteria (positive or negative): 62 total tests

62 tests	None detected
4 tests	Positive for coliform
0 tests	Positive for E. coli

Nitrates (health standard is 10ppm): 60 total tests

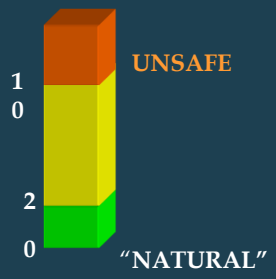
57 tests	None detected
0 tests	< 2 ppm
3 tests	2 – 9.9 ppm
0 tests	10 ppm or greater

NITRATE (mg/l as N) for Township 16N R17E

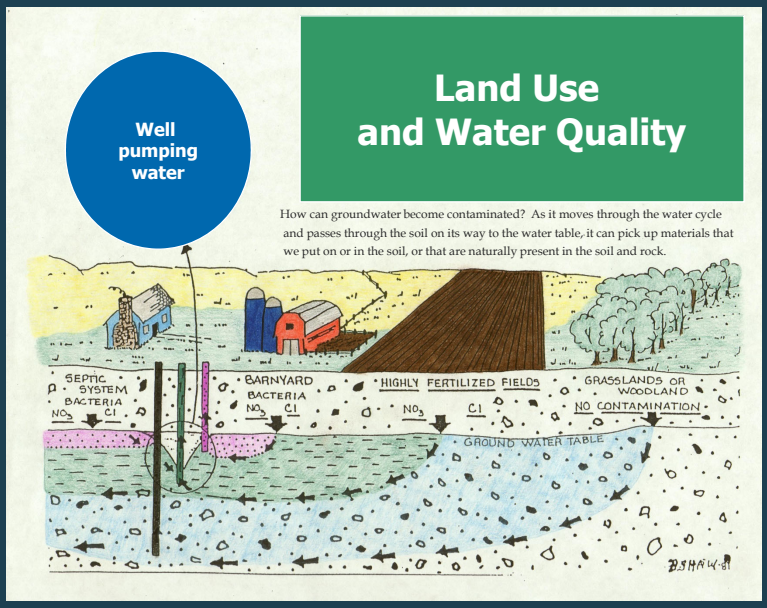
Range	Number	Percent	Summary
None Detected	83	81%	Minimum: No Detect
... 2.0	17	17%	
2.1 - 5.0	1	<1%	Median: No Detect
5.1 - 10.0	1	<1%	Average: 0.2
10.1 - 20.0	0	0%	
20.1 ...	0	0%	Maximum: 8.1
Total Samples:	102		
> 10mg/l N	0	0%	Exceeds Health Standard

Nitrate Nitrogen

- **Greater than 10 mg/L**
  Exceeds State and Federal Limits for Drinking Water
- **Between 2 and 10 mg/L** *Some Human Impact*
- **Less than 2.0 mg/L**
  "Transitional"
- **Less than 0.2 mg/L**
  "Natural"



Land Use and Water Quality



Nitrate-Nitrogen

Health Effects:

- Methemoglobinemia (blue baby disease)
- Possible links to birth defects and miscarriages (humans and livestock)
- Indicator of other contaminants

Sources:

- Agricultural fertilizer
- Lawn fertilizer
- Septic systems
- Animal wastes

What can I do to reduce my nitrate levels?

- Eliminate contamination source or reduce nitrogen inputs
- Change well depth or relocate well
- Carry or buy water
- Water treatment devices
  - Reverse osmosis
  - Distillation
  - Anion exchange

Sampling Results

Bacteria

62 tests	None detected
4 tests	Positive for coliform
0 tests	Positive for E. coli

Nitrates

57 tests	None detected
0 tests	< 2 ppm
3 tests	2 – 9.9 ppm
0 tests	10 ppm or greater

Arsenic (health standard is 10ppb): 59 total tests

4 tests	None detected
34 tests	< 3 ppb
21 tests	3.1 – 10 ppb
0 tests	10 ppb or greater

ARSENIC (ppb) for Township 16N R17E

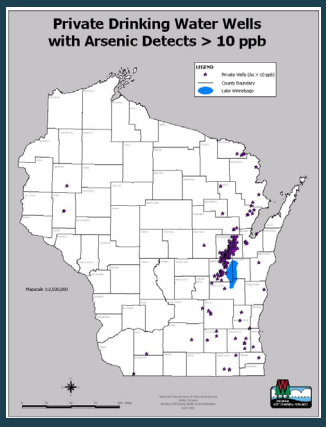
Range	Number	Percent	Summary
None Detected	24	67%	Minimum: No Detect
... 10	11	31%	
11 - 50	1	3%	Median: No Detect
51 - 100	0	0%	Average: 2
101 - 150	0	0%	
151 ...	0	0%	Maximum: 22
Total Samples:	36		
> 10ppb	1	3%	Exceeds Health Standard

Arsenic

- Naturally occurring in mineral deposits
- Standard: 0.010 mg/L (10 ppb)

Health Effects:

- Increased risk of skin cancers as well as lung, liver, bladder, kidney, and colon cancers.
- Circulatory disorders
- Stomach pain, nausea, diarrhea
- Unusual skin pigmentation



A word about water treatment…

- Test water at a certified lab
- Know the types and amounts of contaminants you need to remove
- Choose a device approved by the Wisconsin Department of Commerce for the problems found in your water
- Maintenance is necessary to ensure proper treatment.

Next Steps

- Sample again to double check the results
  - Mayra & Lindsey, Health Department
- Test well **annually** for bacteria, in a different season each time.
- If levels are elevated,
  - Test again immediately if bacteria was present.
  - Test again in 15 months for nitrate.
  - Test again for arsenic in 2-3 years.

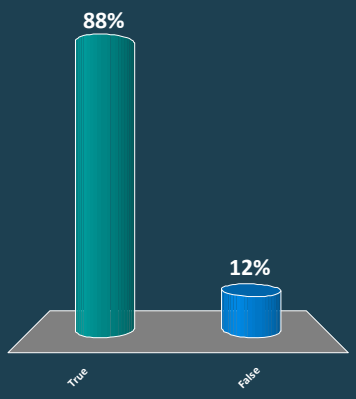
Groundwater Trivia

How much do you know about your Wisconsin drinking water?

PUBL – DG – 055 – 99, 1999, *Wisconsin Natural Resources*, WDNR

I tested my drinking water in the last year.

A. True
B. False



Please indicate your age.

A. Adult (19 years or older)
B. Youth (18 years or younger)
C. Prefer not to respond.

Please indicate your gender.

A. Female
B. Male
C. Prefer not to respond.

Please indicate your race.

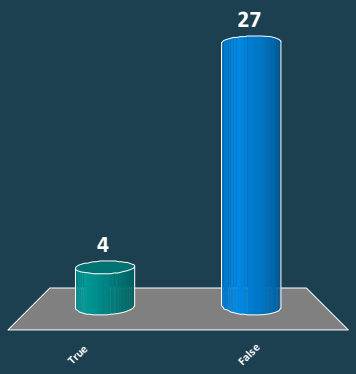
A. American Indian & Alaskan Native
B. Asian
C. Black or African American
D. Native Hawaiian & Other Pacific Islander
E. White
F. Two or more races
G. Prefer not to respond

Please indicate your ethnicity.

A. Hispanic or Latino
B. Not Hispanic or Latino
C. Prefer not to respond.

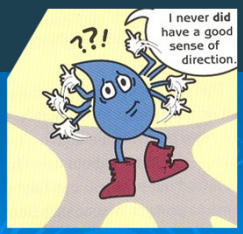
Groundwater always flows from North to South.

A. True
B. False



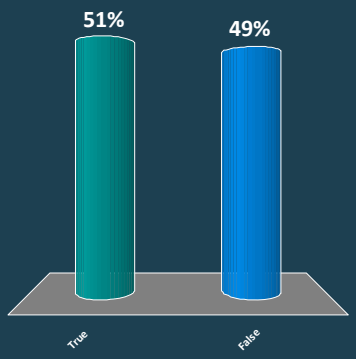
False !

The truth is…Depending on location, groundwater can flow in any direction – but usually follows the slope of the land.



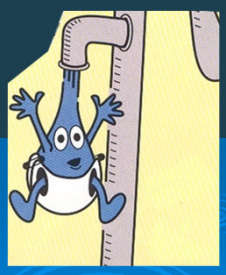
Groundwater drawn from household wells has been underground for thousands of years.

A. True
B. False



False!

The truth is…Typical private drinking water wells in Wisconsin yield groundwater a few years to a few decades old.



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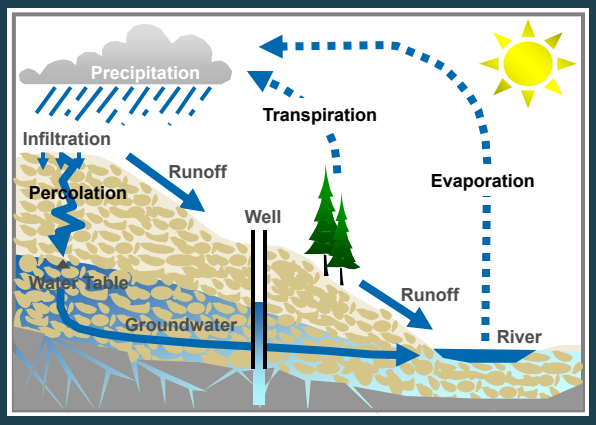
The Water Cycle



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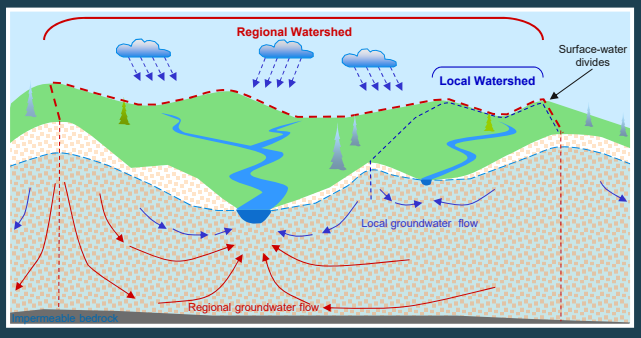
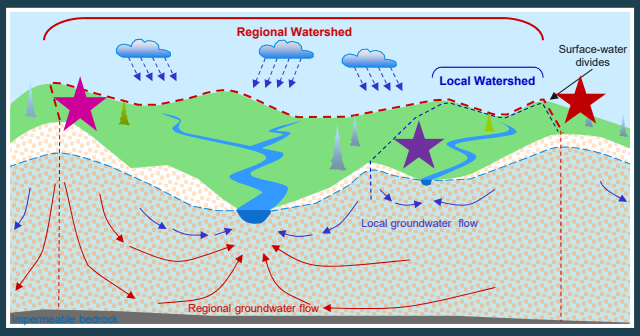


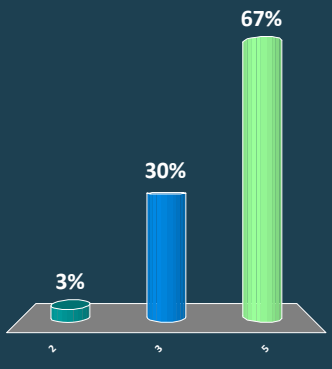
- Water converges at discharge locations
- Rivers and streams act like a drain for water to exit a watershed



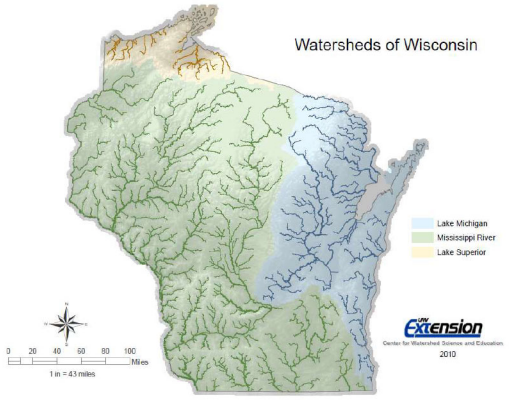
- Water converges at discharge locations
- Rivers and streams act like a drain for water to exit a watershed

How many main (large) watersheds are in WI?

A. 2
B. 3
C. 5



Wisconsin has 3 main watersheds



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WI Watersheds

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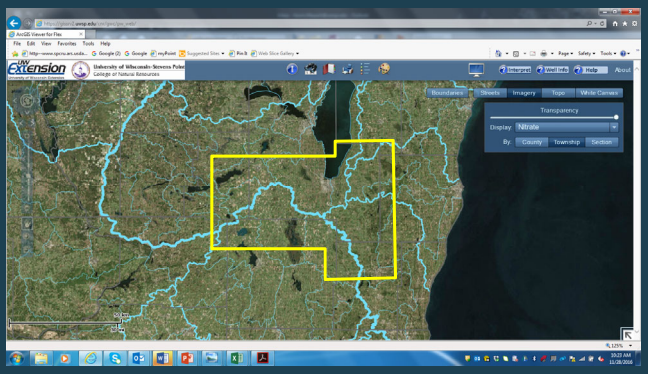
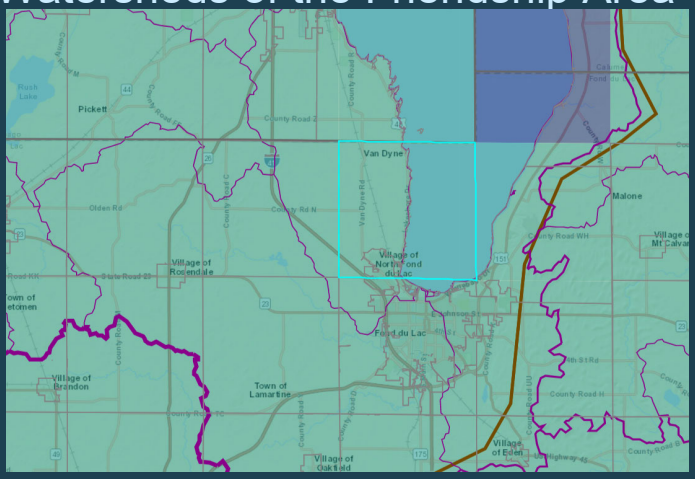
Watersheds of Fond du Lac County

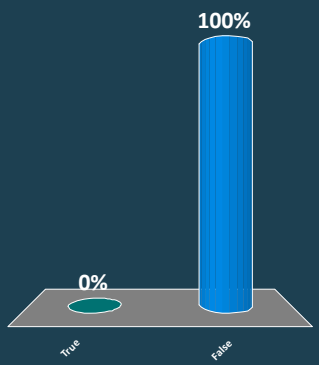


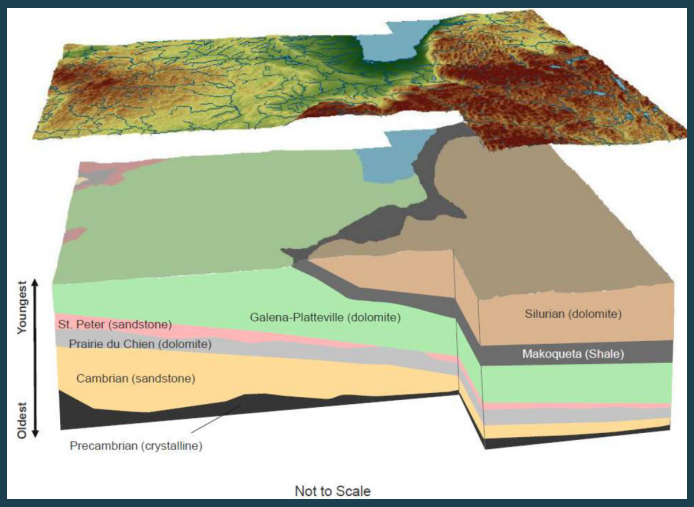
Watersheds of the Friendship Area



Groundwater is only contaminated by human actions.

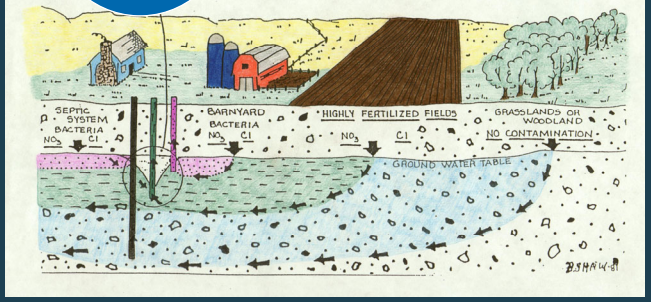
A. True
B. False





Well pumping water

Land Use and Water Quality



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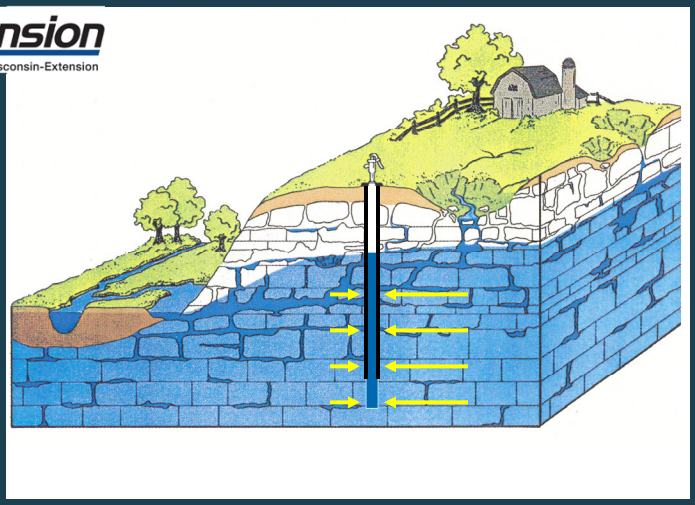
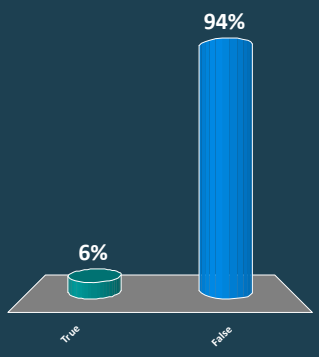


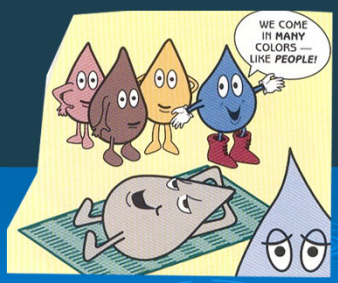
If water is stained, it must be polluted.

A. True
B. False



False!

The truth is…Stained water doesn't necessarily mean that water is unsafe to drink, however; *sudden changes* in color or taste should be investigated.



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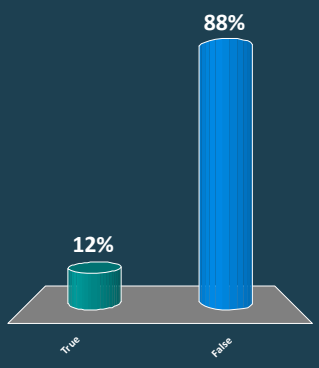
Only one well water test is needed to tell if the water is safe to drink.

A. True
B. False



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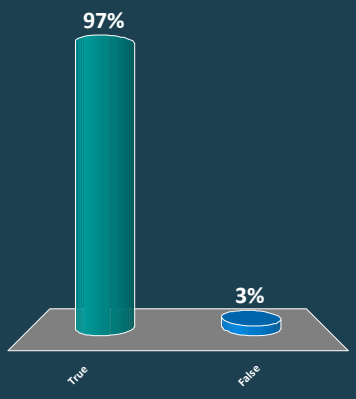
False!

Wells should be tested regularly for bacteria and nitrate. BUT – there are many chemicals that can enter groundwater that won't show up on a routine water test!

Everyday activities like fertilizing your lawn or applying pesticides can cause groundwater pollution.

A. True
B. False

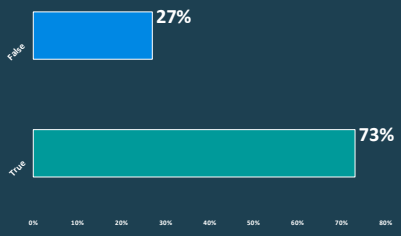


True!

Even small amounts of hazardous substances or common household chemicals can cause groundwater pollution. Anything that we apply to the land surface or put down our septic system has the potential to end up in our groundwater!

True or False: EVERYONE who drinks well water should test it annually for contamination.

A. True
B. False



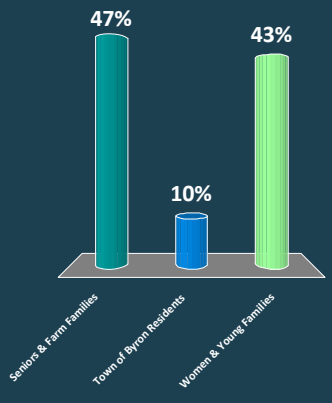
False!

Only those in rural areas with their own private drinking water well need to test it. Municipal employees test well water for those who use on public drinking water systems.

"Montello Water Tower" by J. Stephen Cohen on *flickr.com*

According to Fond du Lac County well users, which group has the most questions about well water sampling?

A. Seniors & Farm Families
B. Town of Byron Residents
C. Women & Young Families



WOMEN

- **Twice** as likely to list the presence of children or pregnant women in the home as a motivation to test.
- **More likely** to say they didn't know which specific contaminants were tested for last time.
- Viewed their well water as **Less Safe.**

YOUNG PEOPLE

asked about well testing are **more likely** to say

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Many LACK INFORMATION on maintaining their well water's safety.

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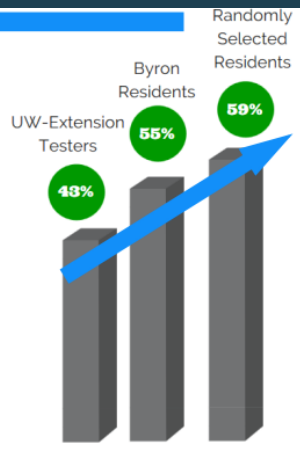

Percent of participants who said they have "*not quite enough*," "*not enough*," or *no information* on maintaining their well water's safety.

Think to Yourself

- Who is a younger woman I can tell about sampling well water?
- When will I next see her?
- What is one fact I will share with her from this program?

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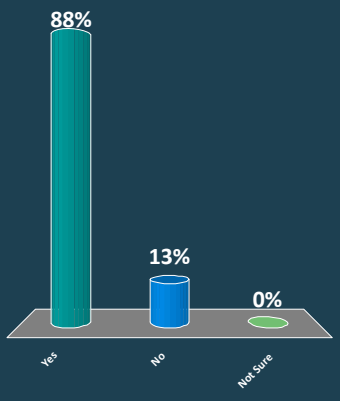
I learned something new tonight about drinking water.

A. Yes
B. No
C. Not Sure



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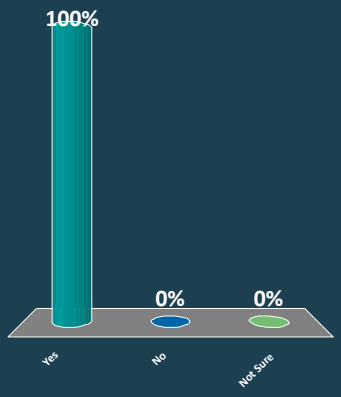
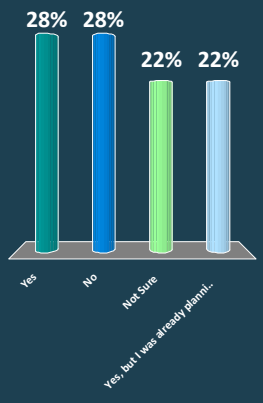
This educational format (a speaker and clicker questions) was effective in helping me learn.

A. Yes
B. No
C. Not Sure



I intend to take an action based on what I learned tonight.

A. Yes
B. No
C. Not Sure
D. Yes, but I was already planning on it before this program.



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Thank You!

- Stay if you have individual questions.
- Stay if you would like to purchase follow up sample bottles or radon test kits.