



Nitrate in Groundwater Survey and Response

Town of Armenia, Juneau County Town
of Port Edwards, Wood County

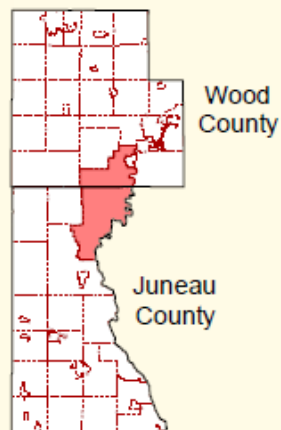
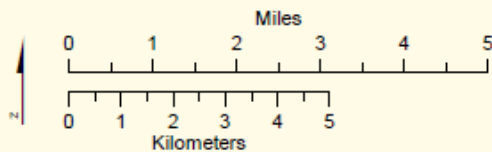
May 30, 2018
April/May 2019

Nancy Eggleston
Wood County Health Dept.

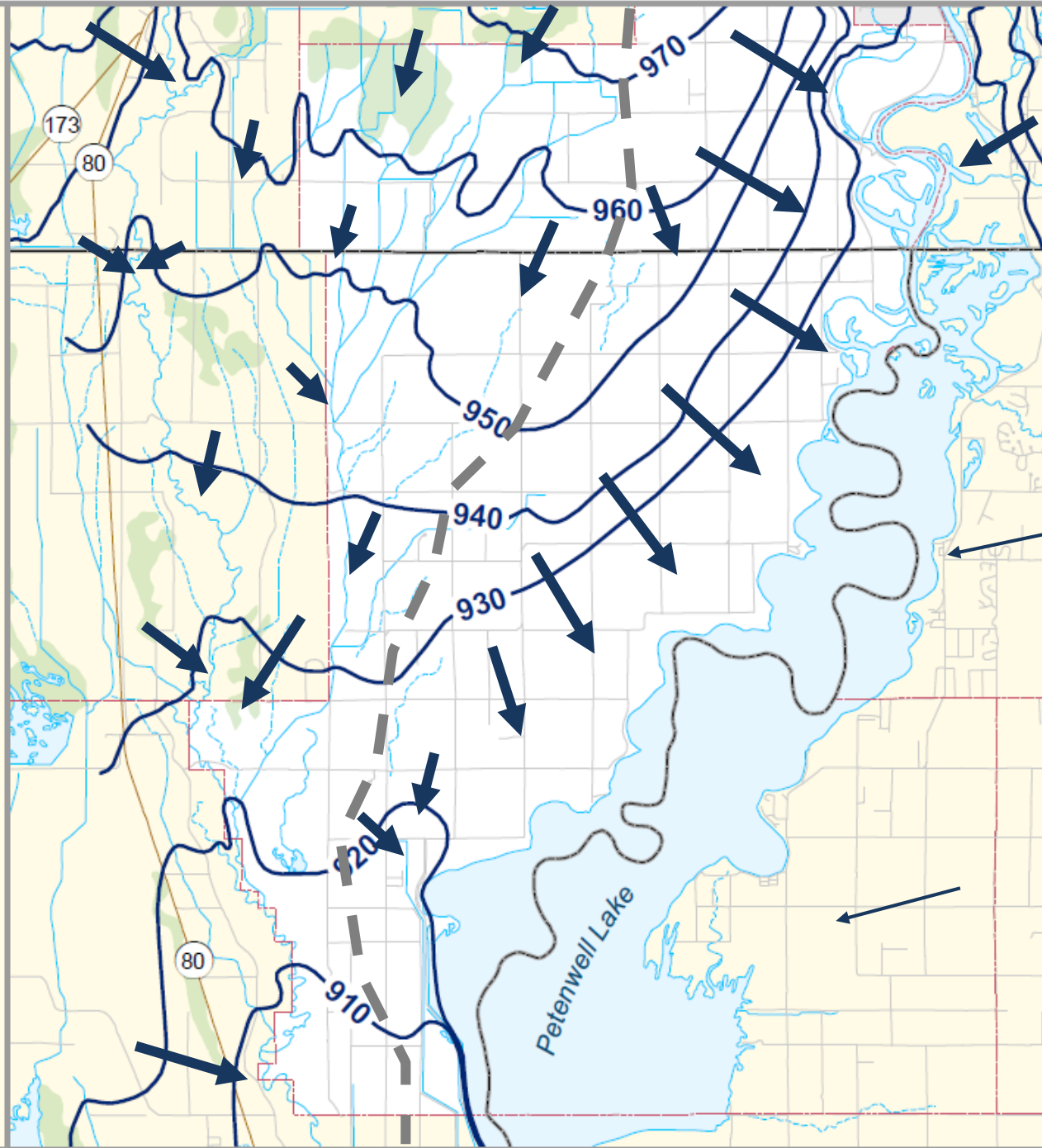
Towns of Armenia & Port Edwards

Juneau & Wood Counties, May 2018

- Streams
- Lakes/Reservoirs
- Wetlands
- State/US Highways
- Other Roads
- Town Boundaries
- Municipalities



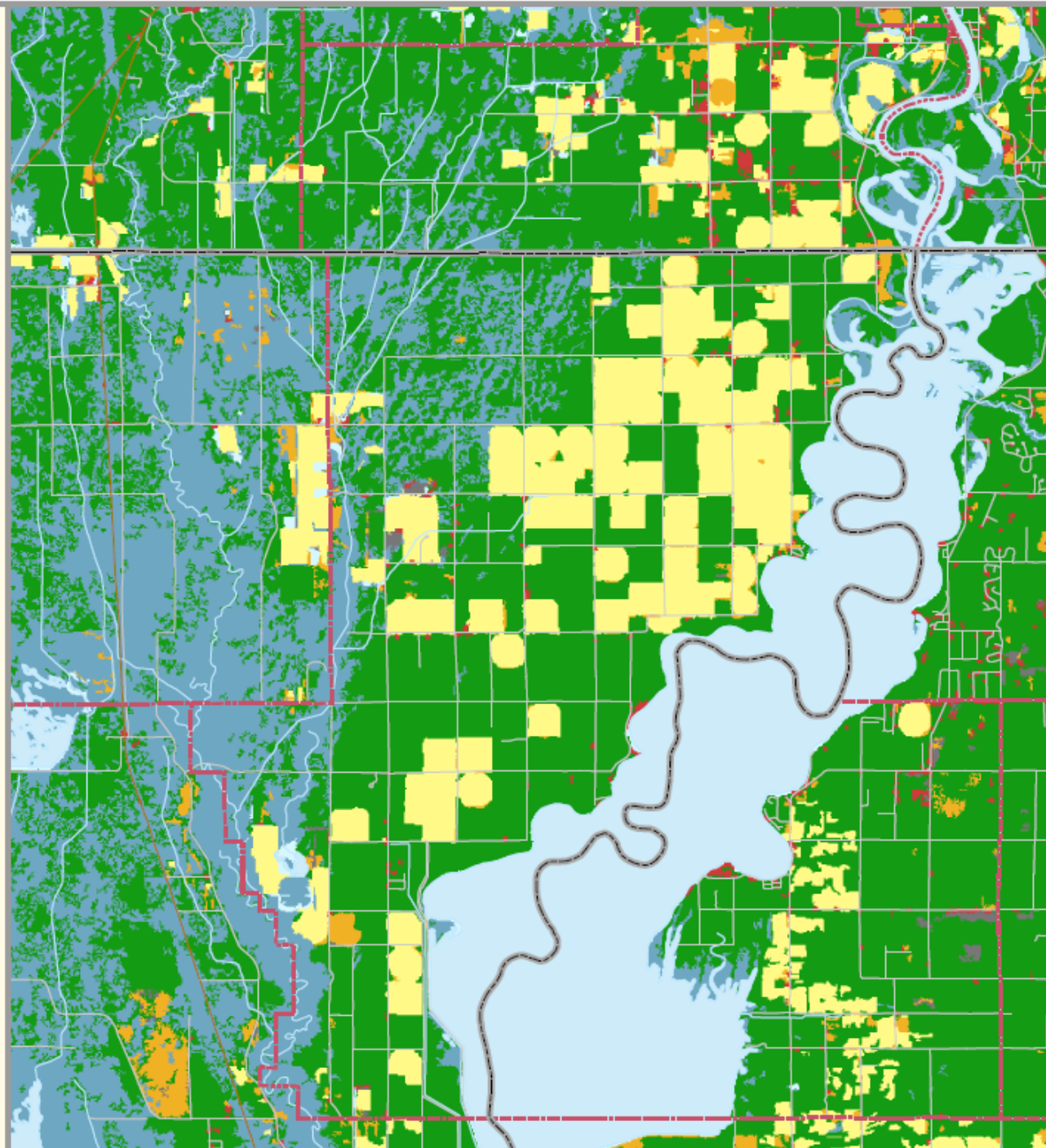
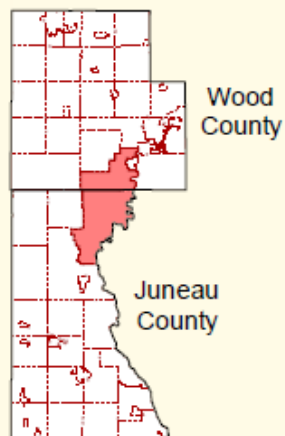
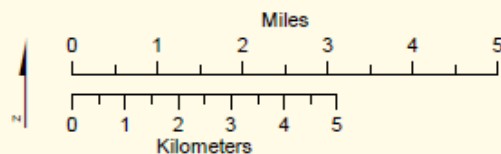
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Towns of Armenia & Port Edwards

Juneau & Wood Counties, May 2018

Land Use:



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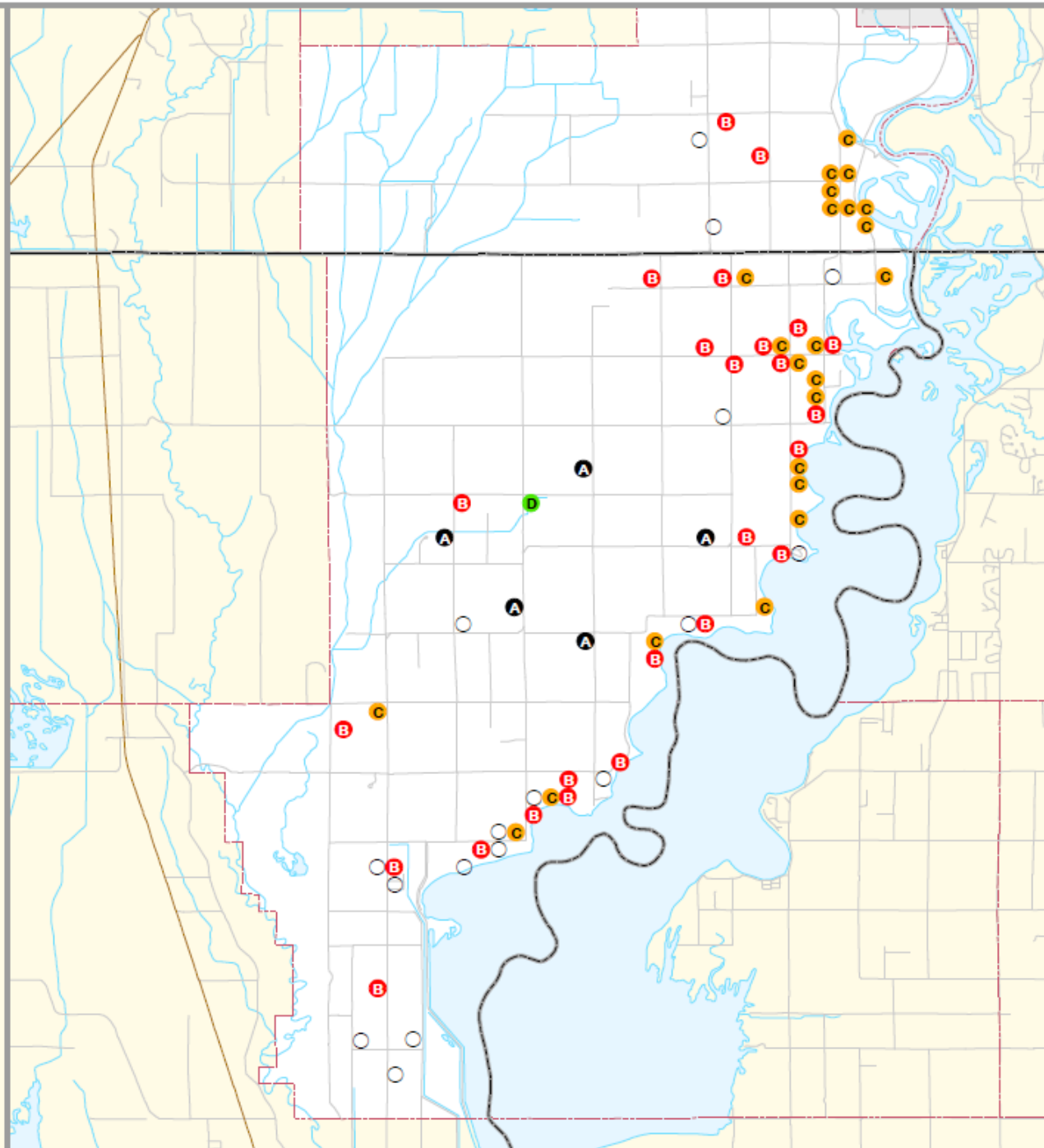
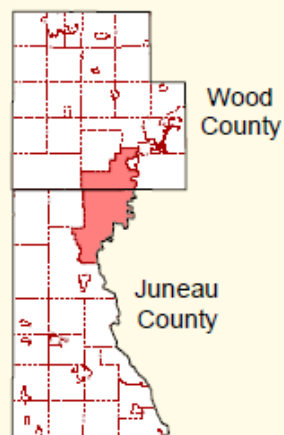
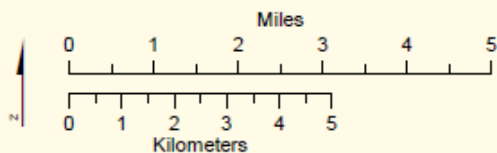
Towns of Armenia & Port Edwards

Juneau & Wood Counties, May 2018

DEPTH OF WELL (ft)

A ... 25	6 %
B 26-50	27 %
C 51-100	30 %
D 101-150	<1 %
E 151-200	0 %
F 201 ...	0 %

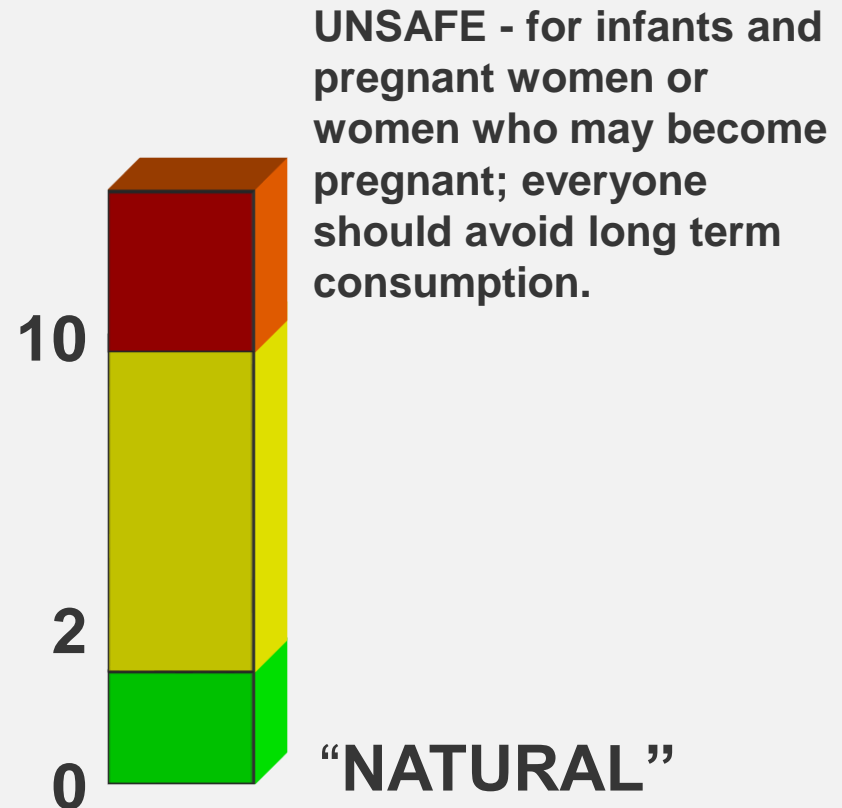
Mapped value is the average for the 1/4 1/4 section



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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”



Sources: Agricultural fertilizer, lawn fertilizer, septic systems, animal wastes or other bio-solid applications

*Indicator of other potential contaminants

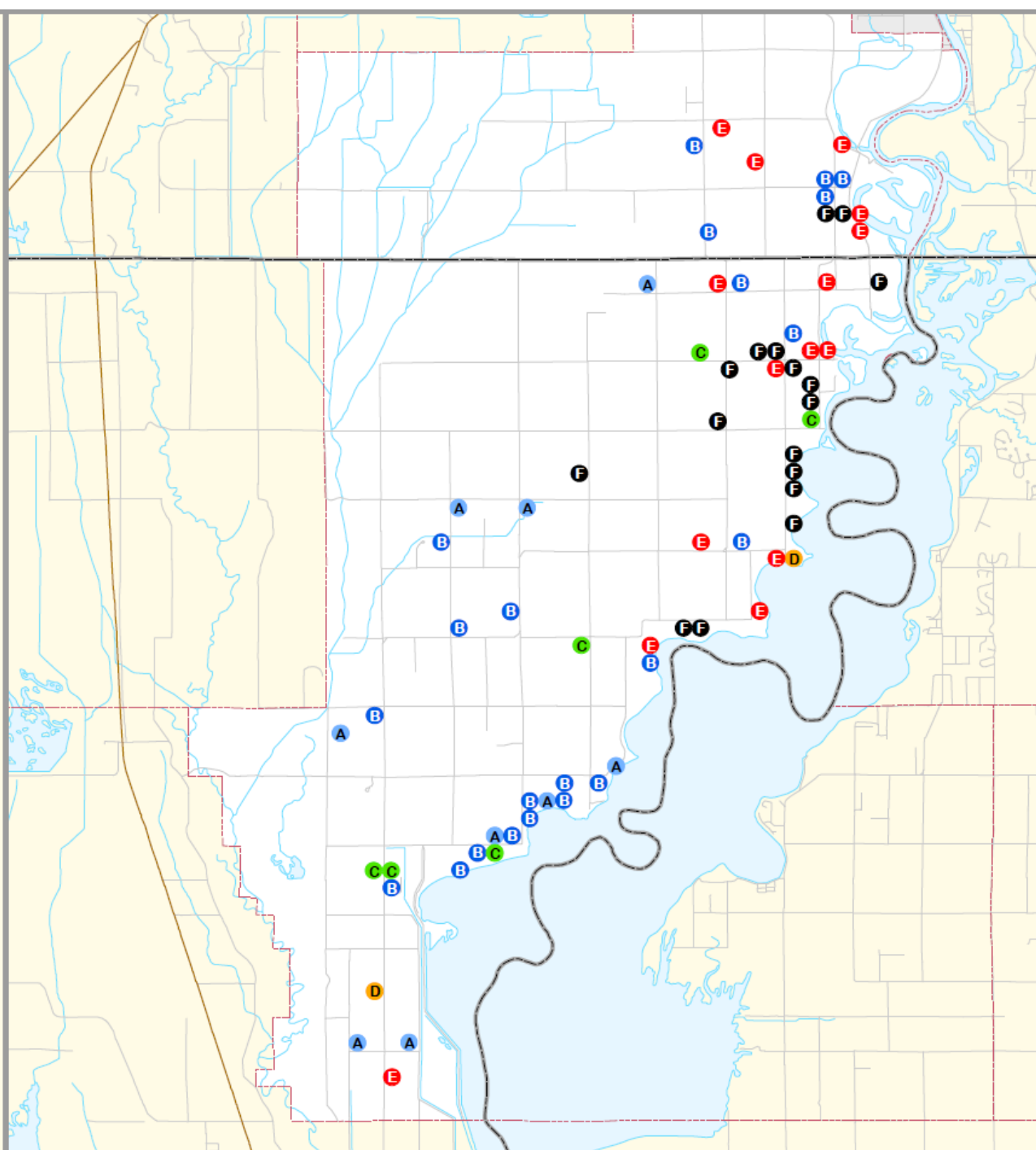
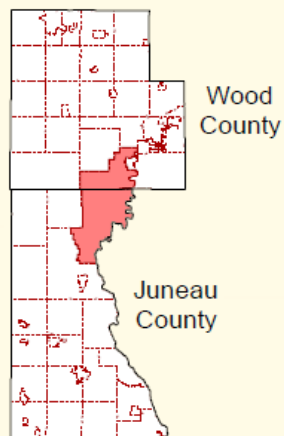
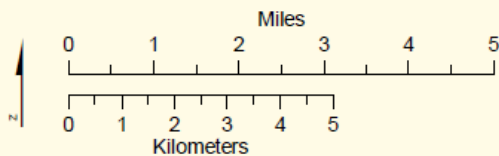
Towns of Armenia & Port Edwards

Juneau & Wood Counties, May 2018

NITRATE-NITRITE (ppm N)

A None Detected	14	13 %
B ... 2.0	31	30 %
C 2.1 - 5.0	6	6 %
D 5.1 - 10.0	9	9 %
E 10.1 - 20.0	19	18 %
F 20.1 ...	25	24 %

Mapped value is the average for the 1/4 1/4 section
Treated samples not mapped



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EPA Nitrate results April 30, 2018

41 Bore holes surrounding Central Sands Dairy

Well depths 20 – 34 feet

- 0 – 10 mg/L 24 (59%)
- 10.1 to 19.9 mg/L 10 (24%)
- 20 to 29.9 mg/L 5 (12%)
- 30 to 39.9 mg/L 2 (5%)
- 40 to 49.9 mg/L 0 (0%)

41% exceeded Nitrate Standard of 10 mg/L





EPA Nitrate samples

41 bore holes surrounding Central Sands Dairy

Well Depths 36 – 49 feet

- 0 – 10 mg/L 24 (58%)
- 10.1 to 19.9 mg/L 7 (17%)
- 20 to 29.9 mg/L 6 (15%)
- 30 to 39.9 mg/L 2 (5%)
- 40 to 49.9 mg/L 2 (5%)
- **42% exceeded Nitrate Standard of 10 mg/L**



EPA Homeowner samples collected near Central Sands Dairy 5/3/2018

	<u>Nitrate</u>	<u>Chloride</u>
Sample 01	34.4 mg/L	32.6 mg/L
Sample 02	34.3 mg/L	49.6 mg/L
Sample 03	21.9 mg/L	24.7 mg/L
Sample 04	40.4 mg/L	39.7 mg/L
Sample 05	29.1 mg/L	36.8 mg/L



Armenia Growers Coalition - Memorandum of Understanding

The Armenia Growers Coalition (AGC) is comprised of 3 farms with fields in the agricultural corridor.

AGC, Wood and Juneau Counties entered into an MOU with input provided by the EPA, DNR, County Corporation Counsels, and Health Departments.

Components of MOU

- **Clean Drinking Water Plan**—free water testing, followed by bottled water and point-of-use RO system for all those over 10mg/L nitrate.
- **Groundwater Hydrogeology, Agricultural Practices, and Monitoring Plan**



Clean Drinking Water Plan

Outreach to over 1000 private residential well owners whose wells were not yet tested.

- Notification of **concerns of high nitrate levels in the area**
- **Health information** on nitrate in drinking water
- Offer of a **free nitrate test** to be analyzed at a DNR certified lab



Groundwater, Hydrogeology, Agricultural Practices and Monitoring plans

Two Year groundwater Study -WDNR

- ID the 3D **distribution of water with $<10\text{mg/L}$ nitrate** to supply well owners
- ID 3D distribution of water to **supply water for at least 25 years** under present land use
- Revise/refine **recommended potable well casing depths** in this area
- ID modeled scenarios that would define **land use changes** helpful to achieve groundwater quality goals



Farmer Led Initiative

Two year program to evaluate ag impacts on groundwater in the study area.

- Farmers will work with WDNR and counties
- This initiative has not begun. They are waiting for water test results.



Wood County Nitrate Test results April/May 2019

AECOM Samples-- Wood County
172 responses-19 not sampled

- 123 Safe
- 30 unsafe

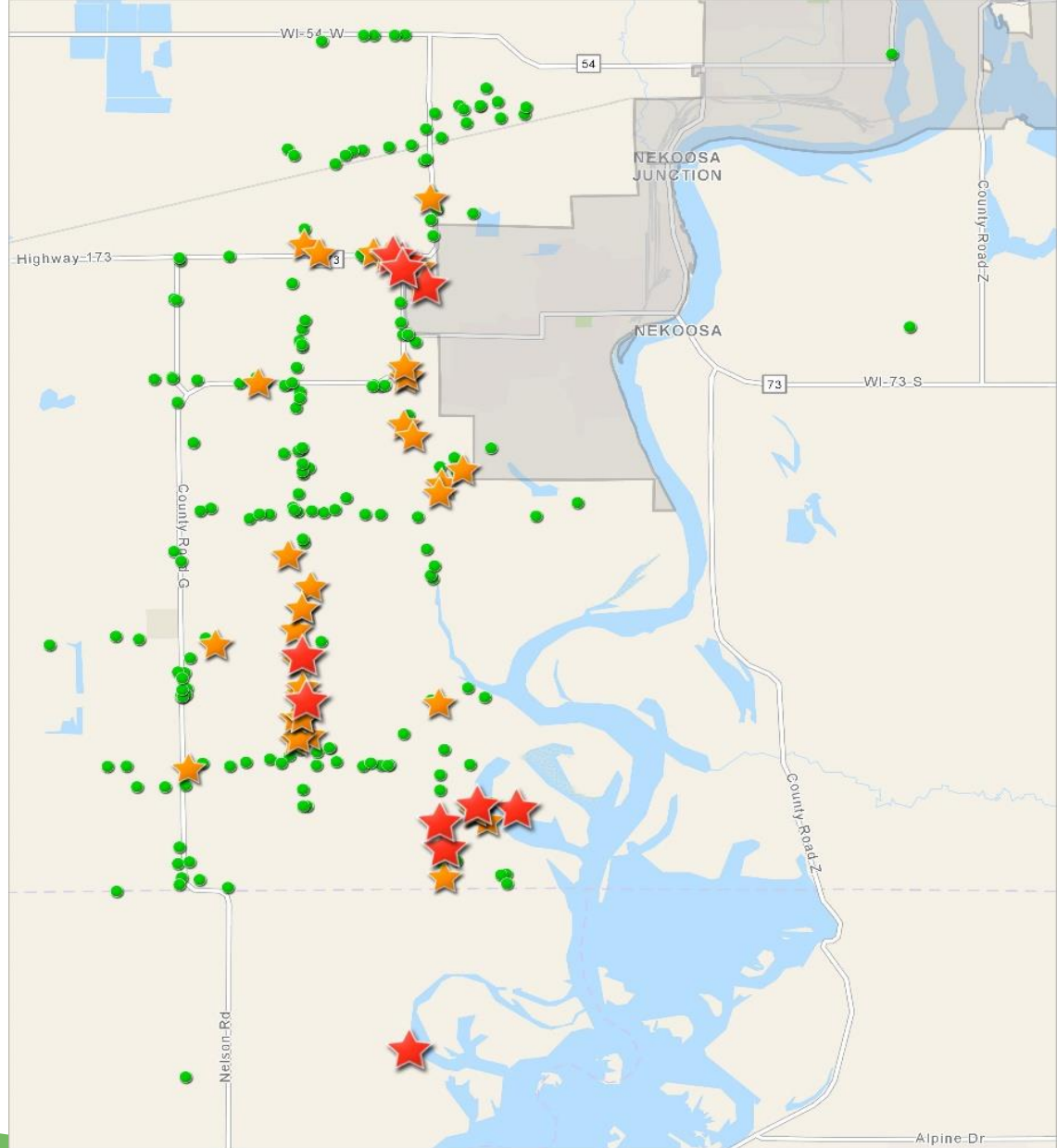
20% unsafe of 153 AECOM samples

Wood County homeowner Self-Sampling—76 tested

- 58 safe
- 18 unsafe

24% unsafe homeowner self-test samples

21% unsafe of the 229 Wood County samples



Unsafe >20



Unsafe 10 to 19.9



Safe <10



Juneau Co Testing

AECOM Sampling—Juneau Co

147 responses—35 not sampled

- 66 safe samples
- 46 unsafe samples

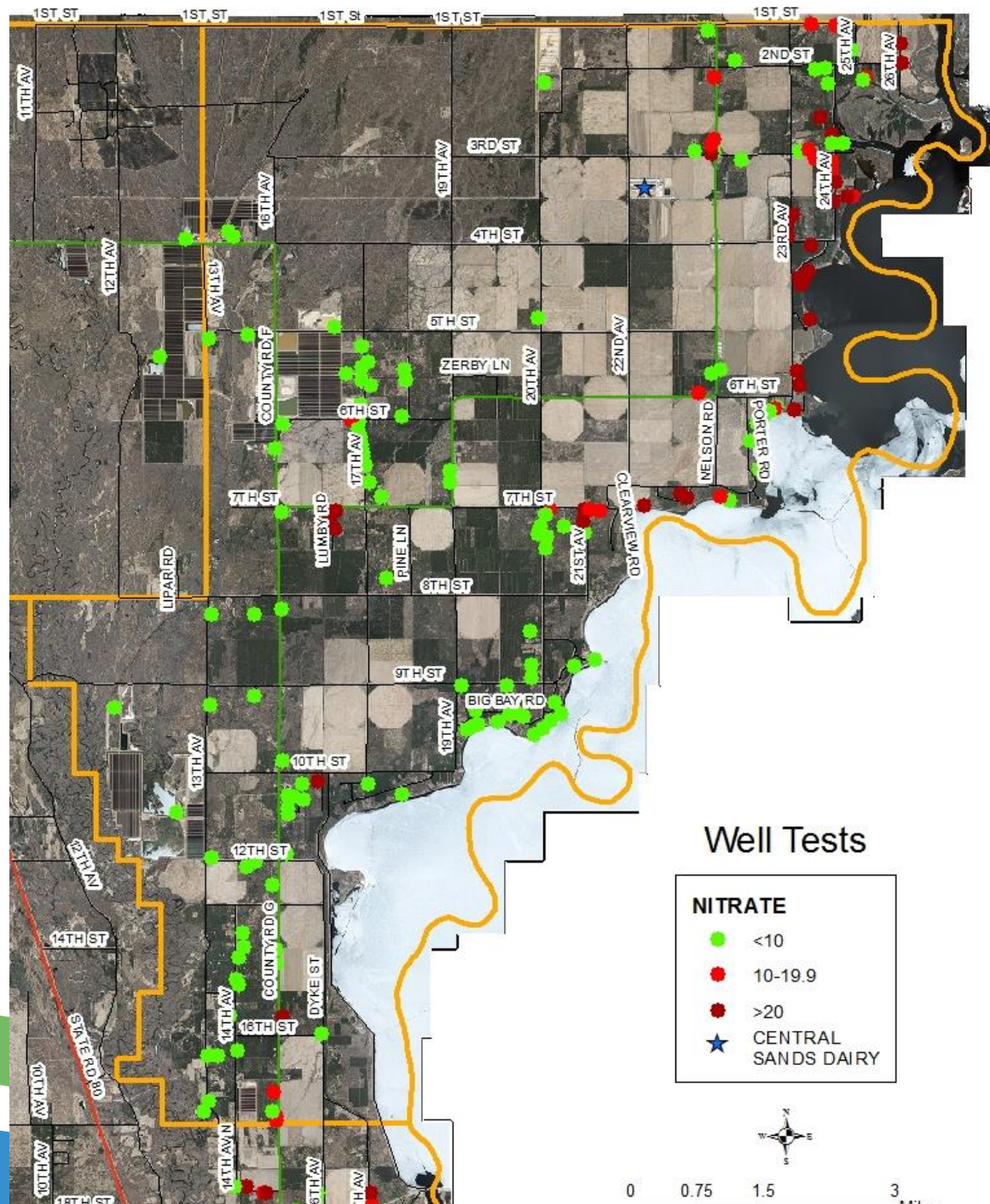
41% of 112 AECOM samples unsafe

Juneau Co homeowner Self-sampling--91 tested

- 75 safe
- 16 unsafe

18% unsafe of self-tests

31% unsafe of the 203 Juneau Co. samples





MOU Progress to Date

- 7 RO systems installed. 14 are scheduled. Homes with nitrate >30 mg/L nitrate and are waiting for an alternate approved system.
- Bottled water is distributed upon request to those exceeding the nitrate standard until a reverse osmosis system can be installed.
- 104 homes tested in May 2018, 432 homes tested in April/May 2019. There are approx. 1000 households in this area, leaving 464 homes to be tested.
- DNR is working with researchers to begin the DNR and AGC funded groundwater study.
- The farmer led initiative did not begin.



Algae Effects

- Algal toxins can affect health depending on the toxin, amount of exposure, and whether inhalation, ingestion or skin exposure
- Poses risk to recreational users
- Causes odors
- Financial burden on businesses with reliance on boaters and other lake patrons using their facilities

Blue Green Algae—photo at Castle Rock Lake





Exposure and Health

*Health Effects of
blue-green algae can
occur minutes to days
after exposure.*

- Respiratory
 - Sore throat
 - Congestion
 - Cough
 - Wheezing
 - Difficulty breathing
 - Eye irritation
- Dermatological
 - Itchy skin
 - Rash
 - Redness
 - Blisters
 - Hives
- Ingestion-Other
 - Earache
 - Agitation
 - Headache
 - Abdominal Pain
 - Diarrhea
 - Vomiting

In severe cases, seizures, liver failure, respiratory arrest, and (rarely) death can occur.





Juneau County Land and Water Resources Surface and Groundwater Quality

Dustin Ladd- Juneau County Conservationist

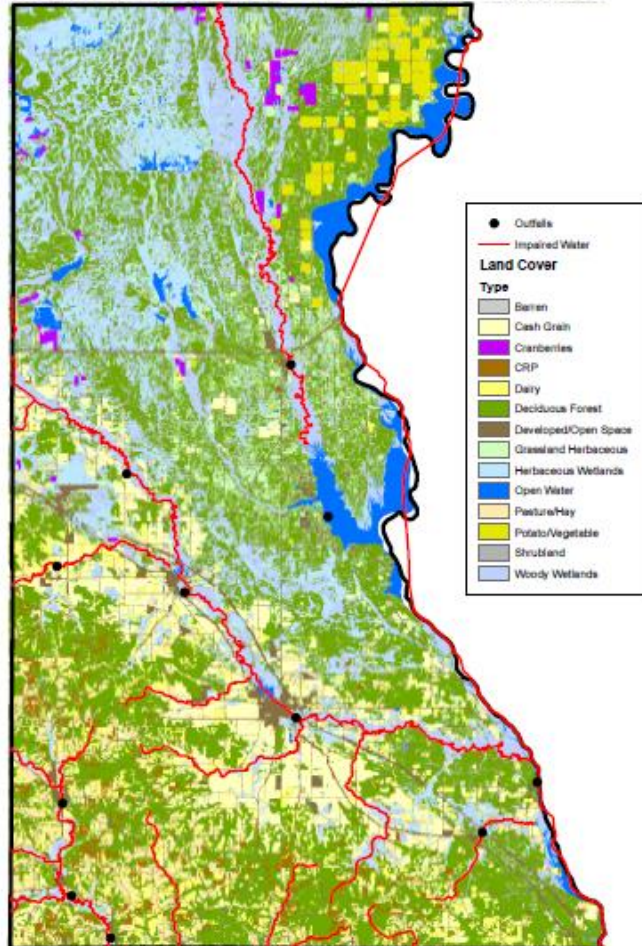


- Nearly 27,000 residents
- 514,752 acres (18,900 acres of surface water)
- Agricultural Snapshot
 - # Dairy farms are decreasing while milk production and cow # increasing
 - Cash Crop production is also increasing



Why Are We Here?

Juneau County Land Use and Impaired Waters



High Nitrate in Private Drinking Wells

The Wood and Juneau County Health and Land and Water Resource Departments are working to ensure that all citizens have a source of safe, clean drinking water.

[Mauston, WI] – High nitrate levels have been found in private drinking water wells of some Juneau and Wood County residents near Armenia Township (Juneau County). We urge residents to take the following actions if their well water has a high nitrate level:

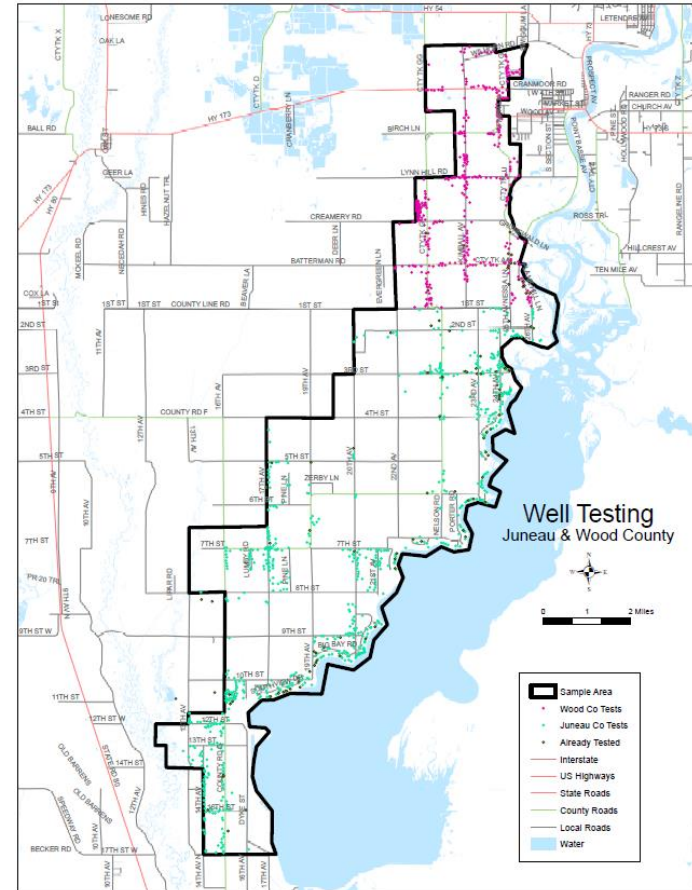


FIGURE 1. TMDL PROJECT AREA



Working Together – Public Health

- Collaborating with Department of Health on Groundwater Quality Concerns
- Working with DNR, EPA, and Armenia Growers Coalition





Education

- Working with UW-Extension to develop a producer-led watershed program and nutrient management training
- Monitoring Programs





Lake Groups



Lake Redstone fixes lowest bid comes in at \$3.2 million

Reedsburg Times Press - May 1, 2019

The last time Lake Redstone was dredged was in 1983 when 10 bays were dredged.

Three companies bid on **Lake Redstone's** dredging ...






Juneau County Well Water Testing Program

In April the Juneau County board approved 15K for a Nitrate testing program

The first weekend of testing was 6/8-6/9 and 150 kits have been given out (90 have been analyzed so far)

**Free Well Water Testing**
Nitrate testing for Juneau County residents
June 3rd - 23rd

1 Pick up locations*
Necedah Town Hall:
Saturday, June 8th 8:00 am - 4:00 pm
Sunday, June 9th 10:00 am - 2:00 pm
101 Center Street,
Necedah, Wisconsin 54646

Juneau County Health Department:
Saturday, June 22nd 8:00 am - 4:00 pm
Sunday, June 23rd 10:00 am - 2:00 pm
M-F 8:30 - 4:00 pm (pick-up only June 3rd - 23rd)
200 Hickory Street
Mauston, Wisconsin 53948
*one free testing kit per well address - limited supply

2 Collect sample
Locate an unfiltered, untreated water source. Run cold water on high for at least 5 minutes. Slow water flow to size of a pencil before collecting sample.

Remove the cap without touching the inside of the bottle or the bottle lip. Fill the bottle 1 inch from the top. Securely tighten the cap.

The sample must be collected and dropped off on the same day.

3 Package sample
Fill out the provided form and seal tightly in one plastic bag.

Place the bag with the form in the second plastic bag along with the sealed bottle.

Keep the entire bagged sample ON ICE until time of drop off. Frozen samples or samples at room temperature will not be accepted.

4 Drop off sample
Necedah Town Hall: June 8th, 8:00am-4:00pm
June 9th, 10:00am-2:00pm
Juneau Co. Health Dept: June 22nd, 8:00am-4:00pm
June 23rd, 10:00am-2:00pm

Juneau County Health Department:
June 4th and 18th before 1:00 pm



Wood County Health Department: Monday-Thursday, 8:00 am-4:30 pm (June 3rd - 21st)

5 Results
Water samples will be analyzed at the Wood County Health Department Water Lab. Lab results will be returned within one month. If the sample tests above 8 ppm you will be notified by phone within 48 hours and on-site confirmatory testing will be done by county staff. Results of this water analysis will be used as part of a survey on groundwater quality in Juneau County.

For more information please contact:

Dustin Ladd: Juneau County Conservationist
608-847-7221

Amanda Dederich: Juneau County Health Department
608-847-9373







Contact Info



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