NORTH Dakota | Environmental Quality

Be Legendary.™

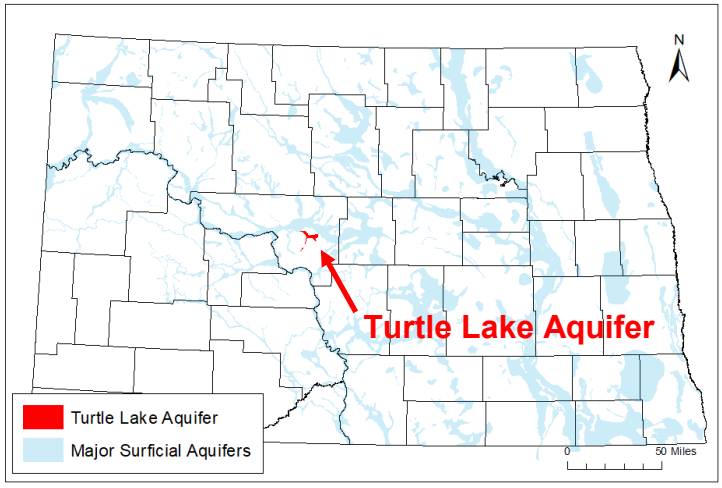
Agricultural Groundwater Monitoring Program

Turtle Lake Aquifer

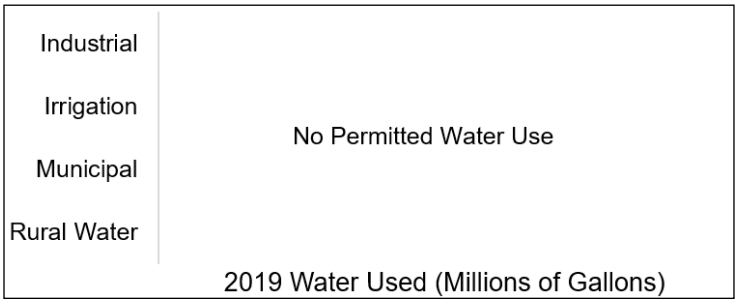
McLean County

Aquifer At-a-Glance	
Area	19.4 square miles
Aquifer Type	Unconfined Surficial
Major Land Uses over Aquifer (percentage of aquifer area covered in 2017)[1]	Crops (37%) Grassland/Pasture (33%)
Depth to Water (2018)*	2-10 feet
Total Unique Wells Sampled	6
Wells Sampled in 2018	4
Samples Collected in 2018	5
Years Sampled	1998, 2003, 2008, 2013, 2018
*Depths to water may vary seasonally, year to year, and across the aquifer	

- Aquifer materials consist of sands and gravels that fill an ancient valley which was carved by meltwater from a glacier.[2]
- Aquifer thickness ranges from 12 to 127 feet. On average, it is approximately 40 feet thick.[2]
- Several domestic and stock wells are installed in the aquifer.
- In North Dakota, permits are required to withdraw large quantities of groundwater. In 2019, no permitted water was drawn from the aquifer. For more information on water use and permits, contact the North Dakota State Water Commission (swc.nd.gov).



2019 Turtle Lake aquifer permitted water use (from North Dakota State Water Commission (swc.nd.gov))↓



About the Agricultural Groundwater Monitoring Program

- The North Dakota Department of Environmental Quality monitors a network of wells in approximately 50 surficial aquifers that are at elevated risk of agricultural contamination.
- Aquifers are sampled on a 5-year rotation.
- Monitoring began in 1992.
- The vast majority of these aquifers are located in central and eastern North Dakota.
- Water is tested for 21 general chemistry parameters, eight trace metals, and 64 pesticides.

References

(1) US Department of Agriculture, 2017, National Agricultural Statistics Service Cropland Data Layer.

(2) Klausing, R.L., 1974, Ground-Water Resources of McLean County, North Dakota. North Dakota State Water Commission County Groundwater Studies 19-Part 3; North Dakota Geological Survey Bulletin 60.

Water Chemistry

Is Aquifer Water High in…?	Analyte	Result	2018 Median Concentration	Potential Effects
	Arsenic	**YES**	0.012 mg/L	Skin or circulatory system damage, increased cancer risk
	Iron	**YES**	4.06 mg/L	Metallic taste/odor, discoloration of surfaces
	Manganese	**YES**	0.22 mg/L	
	Sodium	**YES**	175 mg/L	Taste, people with certain health conditions may need to limit intake
	Sulfate	**YES**	319 mg/L	Taste/odor, laxative effect for people not used to the water
	For more information about Maximum Contaminant Levels (MCLs), health effects, and treatment options for these contaminants and more, see the NDDEQ's fact sheets (deq.nd.gov/wq/1_Groundwater) or visit the US EPA website (epa.gov/ground-water-and-drinking-water).			

Dominant Water Type	Water Hardness
Sodium-Bicarbonate	Very Hard

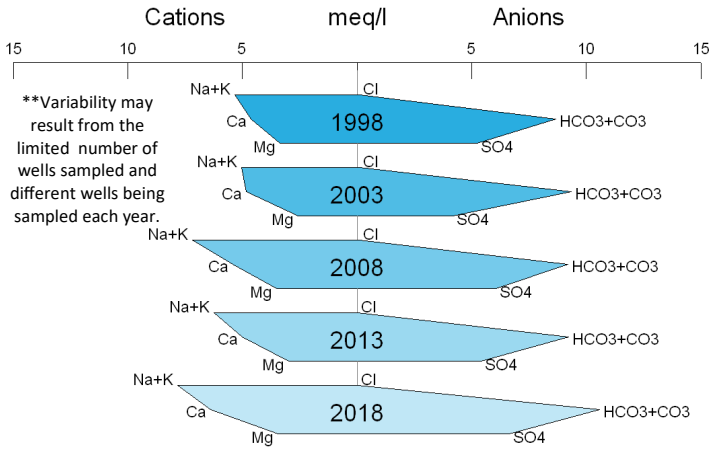
Nitrate

Percentage of Wells Exceeding the Nitrate Maximum Contaminant Level (MCL) (10 mg/L as N).*

No Nitrate MCL Exceedances

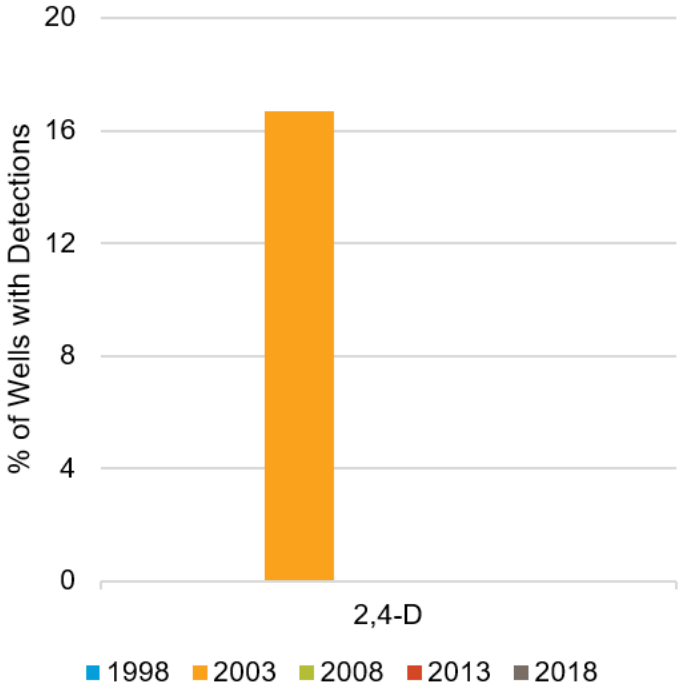
Stiff diagram of aquifer median general water chemistry.

Changes in diagram shape represent changes in general chemistry.



Pesticides

Percentage of wells with detections of each pesticide detected in the aquifer.



State Pesticide Management Plan

Agricultural Groundwater Monitoring Program aquifers are monitored as a part of the State Pesticide Management Plan. A Prevention Action Level (PAL) threshold of 25% of the pesticide's Maximum Contaminant Level (MCL)* or Health Advisory Level (HAL) is used to identify whether action is needed to prevent further contamination.

Prevention Action Level Exceedances	**None**
MCL or HAL Exceedances	**None**

Number of Unique Wells with Pesticide Detections since 1998	**1** of 6 Total Wells

2018 Pesticide Detections

No Pesticide Detections

*Note that MCLs are for public drinking water systems; private wells are not regulated in North Dakota. MCLs still provide guidelines for drinking groundwater.