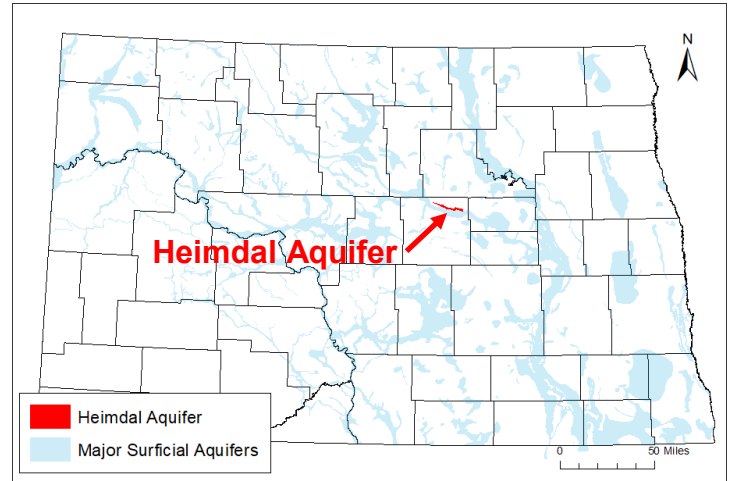


Heimdal Aquifer

Wells County

Aquifer At-a-Glance	
Area	15.8 square miles
Aquifer Type	Unconfined Surficial
Major Land Uses over Aquifer (percentage of aquifer area covered in 2017) ¹	Crops (44%) Grassland/Pasture (30%)
Depth to Water (2021)*	1-5 feet
Total Unique Wells Sampled	7
Wells Sampled in 2021	4
Samples Collected in 2021	7
Years Sampled	1996, 2001, 2006, 2011, 2016, 2021
*Depths to water may vary seasonally, year to year, and across the aquifer	



2020 Heimdal aquifer permitted water use (from North Dakota Department of Water Resources (dwr.nd.gov)) ↓

- Aquifer materials consist of sands and gravels that were deposited in an ancient valley by streams moving meltwater away from glaciers during the last ice age.²
- The aquifer averages about 40 feet thick.²
- Domestic and stock wells are installed in the aquifer.
- In North Dakota, permits are required to withdraw large quantities of groundwater. In 2020, no permitted water was drawn from the aquifer. For more information on water use and permits, contact the North Dakota Department of Water Resources (dwr.nd.gov).

Industrial	No Permitted Water Use
Irrigation	
Municipal	
Rural Water	
2020 Water Used (Millions of Gallons)	

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.

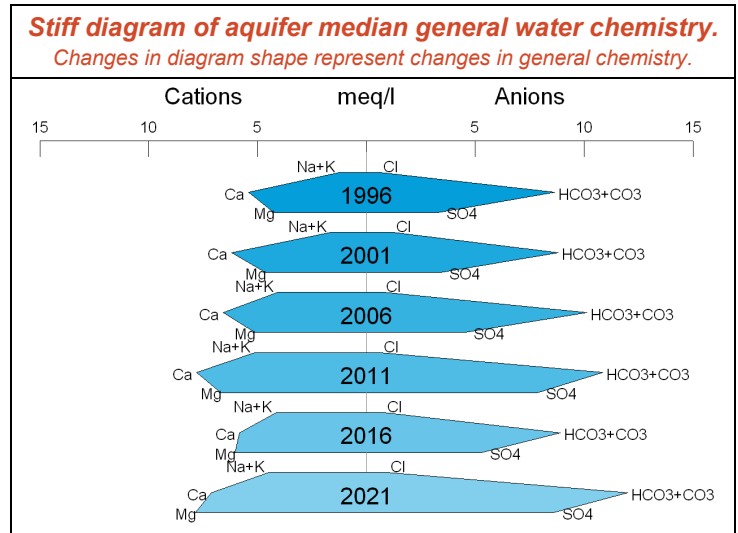
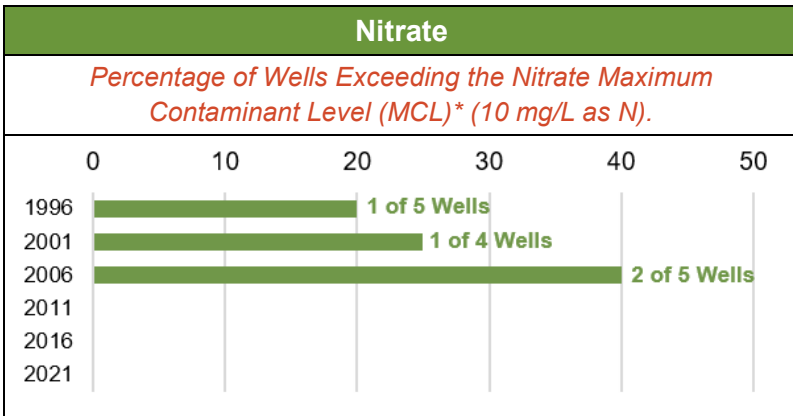
References

- (1) US Department of Agriculture, 2017, National Agricultural Statistics Service Cropland Data Layer.
- (2) Buturla, F. Jr., 1970, Geology and Ground Water Resources of Wells County, North Dakota, North Dakota State Water Commission County Groundwater Studies 12-Part 3, North Dakota Geological Survey Bulletin 51.

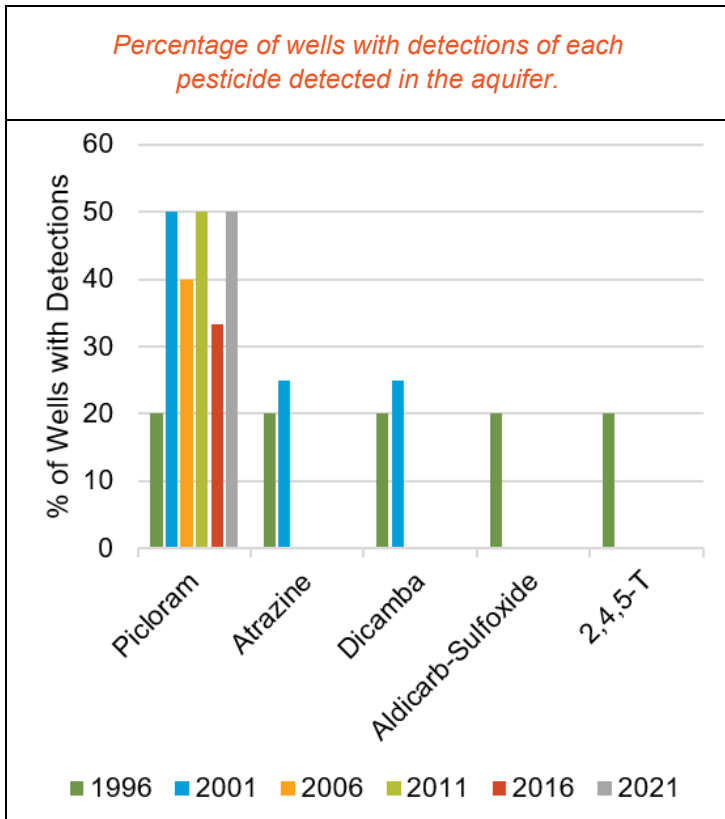
Water Chemistry

Is Aquifer Water High in...?	Analyte	Result	2021 Median Concentration	Potential Effects
	Arsenic	YES	0.011 mg/L	Skin or circulatory system damage, increased cancer risk
	Iron	YES	9.24 mg/L	
	Manganese	YES	0.78 mg/L	Metallic taste/odor, discoloration of surfaces
	Sodium	NO	98.1 mg/L	
	Sulfate	YES	413 mg/L	Taste, people with certain health conditions may need to limit intake
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
Calcium-Magnesium-Bicarbonate	Very Hard



Pesticides



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	Atrazine at 46% of MCL in 1996 and 37% of MCL in 1997 resample. Below PAL in all later samples.
MCL or HAL Exceedances	None

Number of Unique Wells with Pesticide Detections since 1996	5 of 7 Total Wells
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2021 Pesticide Detections		
Picloram	2 Wells	Herbicide applied to crops and roads/rights-of-way

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

Feel free to use this information, but please credit the North Dakota Department of Environmental Quality.