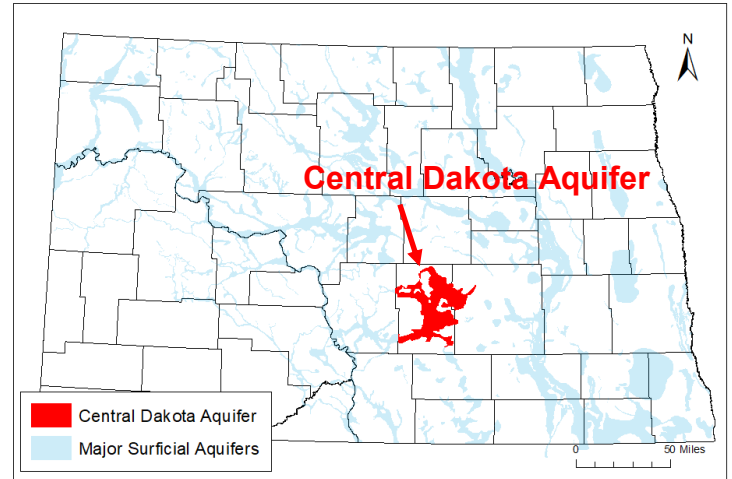


# Central Dakota Aquifer

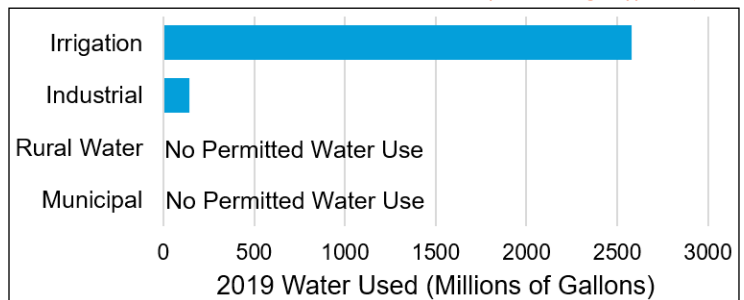
## Kidder and Stutsman Counties

Aquifer At-a-Glance	
Area	683.1 square miles
Aquifer Type	Unconfined and Confined Surficial
Major Land Uses over Aquifer (percentage of aquifer area covered in 2017) <sup>1</sup>	Grassland/Pasture (47%) Crops (28%)
Depth to Water (2019)*	0-70+ feet
Total Unique Wells Sampled	177
Wells Sampled in 2019	121
Samples Collected in 2019	145
Years Sampled	1994/1996, 1999, 2004, 2009, 2014, 2019

\*Depths to water may vary seasonally, year to year, and across the aquifer



2019 Central Dakota aquifer permitted water use (from North Dakota State Water Commission ([swc.nd.gov](http://swc.nd.gov))) ↓



- Aquifer materials consist of sands and gravels that were left behind in glacial till or deposited by streams along the edges of glaciers during the last ice age. Aquifer materials are interspersed among clays also deposited in a glacial environment. The aquifer materials can be found in up to five layers at different depths.<sup>2</sup>
- Aquifer deposits range from 5 to 165 feet thick, with thicknesses between 20 and 60 feet being the most common. Parts of the aquifer system can be found at depths up to 600 feet. Deeper parts of the aquifer system are confined by overlying clay till.<sup>2</sup>
- Domestic, irrigation, and stock wells are common in the aquifer. The northeastern and south-central parts of the aquifer are heavily irrigated.
- In North Dakota, permits are required to withdraw large quantities of groundwater. In 2019, 2.7 billion gallons of permitted water were drawn from the aquifer; irrigation use consumed the largest quantity of water. For more information on water use and permits, contact the North Dakota State Water Commission ([swc.nd.gov](http://swc.nd.gov)).

## About the Agricultural Groundwater Monitoring Program

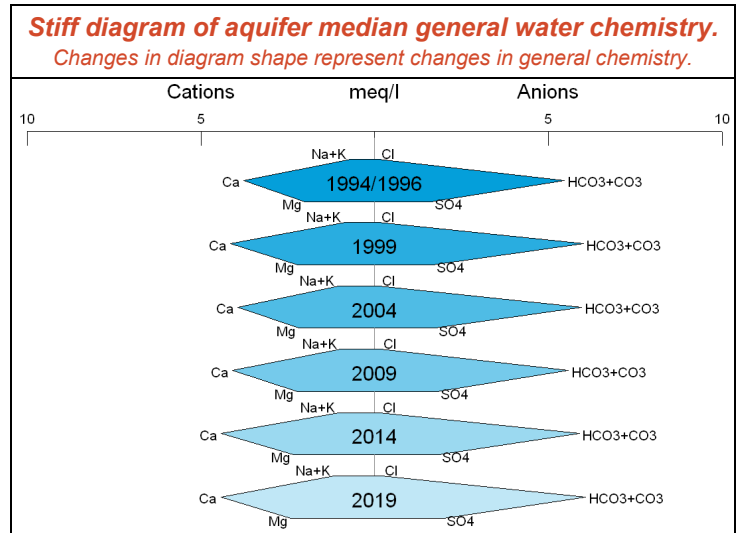
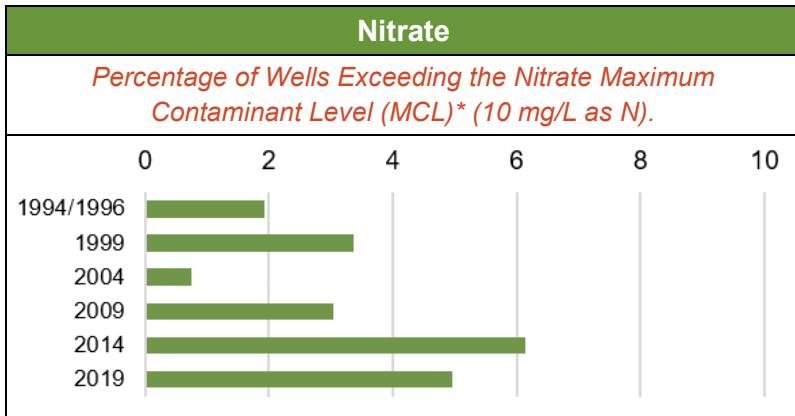
- The North Dakota Department of Environmental Quality monitors a network of wells in approximately 50 surficial aquifers that are at elevated risk of agricultural contamination.
- Aquifers are sampled on a 5-year rotation.
- Monitoring began in 1992.
- The vast majority of these aquifers are located 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) Larson, D.R., 1987, The Hydrogeology of Major Glacial-Drift Aquifers in Burleigh, Emmons, and Kidder Counties, North Dakota, North Dakota State Water Commission Groundwater Study 93-Part 2.

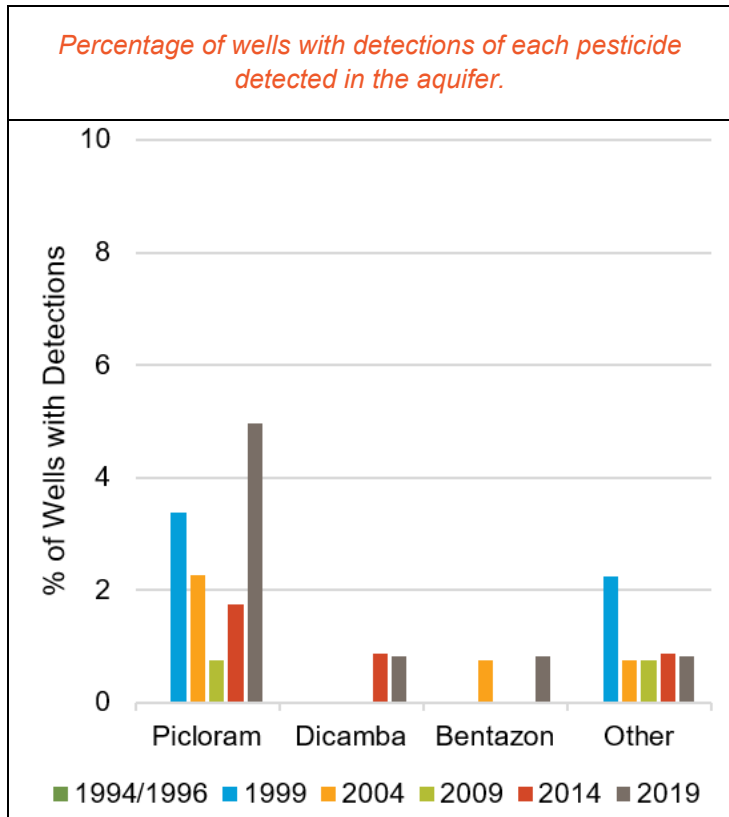
# Water Chemistry

Is Aquifer Water High in...?	Analyte	Result	2019 Median Concentration	Potential Effects
	Arsenic	Locally	<0.005 mg/L	Skin or circulatory system damage, increased cancer risk
	Iron	YES	1.45 mg/L	Metallic taste/odor, discoloration of surfaces
	Manganese	YES	1.02 mg/L	
	Sodium	NO	23.5 mg/L	Taste, people with certain health conditions may need to limit intake
	Sulfate	NO	95.1 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 ( <a href="http://deq.nd.gov/wq/1_Groundwater">deq.nd.gov/wq/1_Groundwater</a> ) or visit the US EPA website ( <a href="http://epa.gov/ground-water-and-drinking-water">epa.gov/ground-water-and-drinking-water</a> ).				

Dominant Water Type	Water Hardness
Calcium-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	None
MCL or HAL Exceedances	None

**Number of Unique Wells with Pesticide Detections since 1994**      **18** of 177 Total Wells

2019 Pesticide Detections		
Picloram	6 Wells	Herbicide applied to crops and roads/rights-of-way
Bentazon	1 Well	Herbicide applied to crops
Dicamba	1 Well	Herbicide applied to crops
Pentachlorophenol	1 Well	Multi-use pesticide, wood preservative

\*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.**