Data Interpretation Guide:

UNDERSTANDING GROUNDWATER QUALITY

A guide to what the data is, what it means, and how to use it responsibly.

WHAT THIS DATA IS

This dataset consists of groundwater quality analytical sample results collected from a network of observation wells. It includes background (ambient) water quality measurements that describe the natural chemical makeup of groundwater. This means the water is largely unaffected by direct sources of pollutants or other direct human influences. The data covers a wide range of groundwater quality indicators, including:

- basic chemistry
- dissolved metals
- organic chemicals (including select groups of pesticides, hydrocarbons, or other chemicals)

WHY THIS DATA IS COLLECTED

The data is collected to understand the background and long-term condition of groundwater quality over time. It helps track changes, identify trends, and establish baseline conditions that can be used to detect impacts to groundwater resources. This information supports informed groundwater management, protection, and planning decisions.

WHERE THE DATA COMES FROM

The data is collected through a groundwater monitoring program using a network of about 40 observation wells, with samples taken on a rotating basis over roughly five years (about 8 wells sampled per year). Sampling has been ongoing for many years, with new parameters added over time with emerging contaminants of concern. Samples are collected by field staff using standard groundwater sampling methods and analyzed by accredited laboratories.

WHAT THE DATA CAN TELL YOU

The portal only presents raw sample data, and no additional interpretation or evaluation is provided. The sample results for each well can be reviewed relative to the sampling dates and the chemicals analyzed. The portal allows users to search and sort data using a variety of options. The data can also be downloaded for further detailed analysis, such as:

- Evaluating general patterns and trends in groundwater quality over time
- Determining baseline conditions, long-term groundwater chemistry variability, and broad differences between wells or areas
- Understanding regional, natural groundwater conditions rather than short-term or site-specific issues

WHAT THE DATA CANNOT TELL YOU

The portal is designed to show patterns and changes in water data, but it does not explain the underlying causes on its own. Changes in water levels or quality can happen for many reasons, including natural factors like weather and seasonal cycles, as well as human activities such as land use or water withdrawals. The data alone cannot distinguish between what is naturally occurring and what may be influenced by human activity. Because of this, the information is best understood as part of a broader picture. Interpreting causes or drawing conclusions often requires additional data, local knowledge, or professional expertise.

How to Interpret the Data

The data should be viewed as part of a long-term monitoring program, with attention to overall trends rather than individual results. Natural groundwater variability, sampling timing, location and geological differences between wells can all affect results.

Important Limitations and Caveats

- Each well is not sampled every year: The sampling program is based on completing a round of samples for the entire network (40 locations) once, over a five-year cycle.
- Some parameters may have been sampled during certain limited time periods or for select parameters on a one-time basis, limiting direct or long-term comparisons.
- Results reflect conditions at specific wells and depths and may not represent nearby private wells or current conditions everywhere.

Common Misunderstandings

- The data does not represent drinking water quality in homes
- Individual sample results do not provide definitive proof of contamination or change
- Long-term patterns, errors and uncertainty must be considered

Where to Learn More or Get Help

Nova Scotia provides a number of online resources for assessing groundwater quality information, including drinking water safety criteria, common occurrences, water quality treatment options and provincial geographical distribution.

- Groundwater Chemistry Maps – these maps show naturally occurring water chemistry parameters in Nova Scotia. The selected parameters include alkalinity, bicarbonate, carbonate, sodium, potassium, calcium, magnesium, fluoride, sulphate, chloride, hardness, total dissolved solids, pH, nitrate + nitrite as nitrogen, arsenic, uranium, iron, and manganese.
- Nova Scotia Groundwater Atlas – This online map tool has groundwater chemistry data from varied sources throughout the province. It is a helpful resource for advanced users.
- Drop on Water - Information on common groundwater chemicals is found in our Drop on Water series. This series also provides information on drinking water quality criteria and water quality treatment.
- Nova Scotia Drinking Water Interpretation Tool – This online tool helps you assess your private well water quality. It allows you to input your water chemistry data for direct comparison to drinking water quality criteria.