

Groundwater Resources in the Saskatoon Area

Groundwater resources in the Saskatoon area have been mapped at a regional scale by the Water Security Agency (WSA) and include both shallow and deep aquifers. Significant groundwater resources, listed from deepest to shallowest, include the Tyner Valley Aquifer, Forestry Farm/Dalmeny Aquifers, and surficial aquifers. Groundwater from these aquifers is used currently for domestic and other purposes, including municipal supply for communities outside of Saskatoon.

Shallow aquifers tend to provide the freshest water and are most targeted for groundwater use. These wells are also the most vulnerable to contamination from surface sources and fluctuations in water availability linked to climate and water use. Deeper aquifers tend to have greater water availability, but the water tends to be mineralized and is costly to access.

Risks of Using Groundwater in Saskatoon*Water quality*

Untreated groundwater from private wells is not always safe for drinking water purposes. Testing is required to guarantee its safety and treatment is sometimes also needed to meet federal-provincial drinking water quality objectives. The City of Saskatoon (City) provides safe drinking water sourced from the South Saskatchewan River and is not responsible for ensuring that groundwater from private wells is tested or treated.

Groundwater can be used for irrigation without treatment if it is not too saline, however minerals dissolved in groundwater can accumulate in irrigation equipment over time necessitating more frequent maintenance. Irrigation with saline groundwater can negatively impact soil quality and plant health.

In addition, bacteria from sanitary sewer line leaks, nitrates from lawn fertilizers or agricultural sources, and chemicals from spills are all contamination risks to groundwater. The number of potential contaminant sources are greater in Saskatoon when compared to rural areas due to the higher population density and more variable land use within city limits. Contaminants can reach aquifers either by infiltrating through soil and migrating through groundwater or by entering poorly maintained or abandoned groundwater wells.

Cross Contamination

The provision of two separate water sources to a property creates the risk of untreated and unregulated groundwater entering the municipal supply, potentially contaminating and impacting city supply and infrastructure.

Pumping Wells

Pumping wells can be up to 0.6 meters (2 feet) in diameter as indicated in the picture below.



Fig. 1: Large diameter pumping well (source: Water Security Agency)

Regulation of Pumping Wells

The WSA regulates the use of groundwater for non-domestic (industrial and commercial) purposes in Saskatchewan through the issuance of water rights licenses. The agency monitors groundwater levels, allocations, and use from aquifers in the southern half of the province, thereby administering and managing groundwater resources at a regional scale.

Domestic purpose groundwater pumping wells on residential property are not regulated by the WSA. There are currently an estimated 350 pumping wells within Saskatoon city limits, however their location and status (active/inactive) are not precisely known. The City's current bylaws do not address the installation nor operation of groundwater pumping wells in Saskatoon.

The Ministry of Energy and Resources regulates oil and gas wells, geothermal wells, and disposal wells within Saskatchewan. These activities require a licence obtained through an application and review process.

Monitoring Wells

Monitoring wells are used to inform development or redevelopment of property or for environmental monitoring. They can have flush mounts, no protective casing or metal protective casings as indicated in the photos below. However, they are sometimes installed and neither maintained nor decommissioned properly which presents groundwater quality, public safety, and liability risks to the property owner.



Fig. 2: Flush mounted well



Fig. 3: Well with no protective casing



Fig. 4 Well with metal casing and lock

Regulation of Monitoring Wells

Monitoring wells are not regulated by the province. The City's current bylaws do not address the installation, maintenance nor decommissioning of groundwater monitoring wells in Saskatoon.

Key Terms

Abandoned well: a well that is no longer used¹.

Aquifer: any geological formation from which groundwater can be withdrawn in usable quantities to suit a given need².

City water: water supplied from the City of Saskatoon water works system.

City water works system: any City of Saskatoon asset or facility for the collection, transmission and treatment of water including the main lines of the system³.

Decommissioned well: a well that has been properly sealed to prevent the vertical movement of water within it².

Domestic purpose: household and sanitary purposes, the watering of stock, the spraying of crops, the watering of noncommercial lawns and gardens adjoining private residences. Does not include the sale or barter of water for such purposes²

Groundwater: water beneath the surface of land².

Industrial purposes: any purposes for which water is used in the production of goods and services and includes the use of water for cooling purposes².

Irrigation purposes: the controlled application of water to soil for the purpose of supplying moisture essential to plant growth².

Monitoring well: a well used for measuring, testing, or sampling groundwater.

Municipal purposes: household and sanitary purposes, the watering of streets, walks, paths, boulevards, lawns and gardens, fire protection and the flushing of sewers, and includes the construction of buildings and of civic works, and other purposes usually served by water within a city, town, or village and such other purposes².

Pumping well: a well used for withdrawing groundwater for domestic or non-domestic purposes other than testing or sampling.

Well: an opening made by drilling into the ground for the purpose of obtaining groundwater or scientific data on groundwater, whether water is obtained or not⁴.

¹ [Decommissioning Abandoned Water Wells Fact Sheet](#) FS-309. 2013. Water Security Agency.

² [The Ground Water Regulations](#). Saskatchewan Regulation 172/66. Last amended 2006.

³ *Bylaw 8880, Private Sewer and Water Service Connection Bylaw*, City of Saskatoon, 2010.

⁴ [The Water Security Agency Act](#). Chapter W-8.1 of the Statutes of Saskatchewan. Last amended 2019.