

Summary of Groundwater

Frontier Lithium Inc (Frontier) is proposing to develop an open pit mine with supporting facilities, known as the PAK Lithium Project (Project). The Project is located approximately 175 km north of Red Lake. Indigenous communities in proximity to the Project include Deer Lake, North Spirit Lake, Sandy Lake and Keewaywin.

Frontier retained SLR Consulting (Canada) Ltd. to complete a Hydrogeology report in support of the Project. Hydrogeology is the science of groundwater and how it flows and interacts with rocks and soils under the earth's surface. Collection of environmental baseline data for the Project has been ongoing since 2016, although sampling had been sporadic in the earlier parts of the program. Regular monitoring was initiated in 2021 and 2022. **Frontier will be completing ongoing data collection in 2024.**

Groundwater investigations have included borehole drilling and installation of many overburden and bedrock monitoring wells. Hydraulic conductivity is the ability and ease at which groundwater is able to flow through soils and rocks and the spaces in between them under the earth. The lower the hydraulic conductivity, the slower the water will move through it. The measurement of hydraulic conductivity of both the overburden and bedrock has been estimated through a combination of grain size distributions, as well as rising and/or falling head tests and packer tests, which involve creating a change in water level to monitor the ability of a well to respond (how fast/slow it refills) to changing conditions (i.e. a measure of how easily groundwater can pass through soil or rock).

The overburden in the Project footprint is made up of topsoil and peat on top of silt and clay as well as sand to silty sand deposits. The average hydraulic conductivity of the overburden are estimated to be 10^{-5} m/s (meters per second) for the sand, silty sand or clay and sand, to 10^{-6} m/s for the clay, silt and till. Highly conductive materials, in which groundwater can flow through easily, can be on the order of 10^{-2} m/s and highly restrictive materials, in which water cannot flow through as easily, on the order of 10^{-10} m/s. Bedrock that was sampled during the borehole drilling was mostly made up of granite rock, metasediment, and metavolcanic rock (meta meaning rock that has been transformed by heat or pressure), with occasional gneiss. The quality of the bedrock was observed to be of fair to excellent (having a Rock Quality Designation or RQD greater than 60% to 100%). The average hydraulic conductivity of the bedrock was in the range of 10^{-6} to 10^{-5} m/s. The bedrock hydraulic conductivity values did not show much change with depth, however testing at deeper points has been limited.

Groundwater was observed to respond to rainfall events, with a slight delay. Artesian conditions (areas where the groundwater is under pressure and flows to the surface naturally) are noted in some locations, mostly in low-lying areas of the land. The groundwater quality suggests that there are many metals naturally within the groundwater such as aluminum, arsenic, cobalt, copper, iron, lead, nickel, phosphorus, uranium, vanadium and zinc. Elevated concentrations of these parameters are reflective of the natural mineralization of the area.

