

The Akaitcho Dene community of Lutsel K'e is nestled in Christie Bay in the majestic East Arm of Great Slave Lake. The community is surrounded by crystal clear water which reflects towering cliffs and amazing rock formations. Great Slave Lake is known for its deep waters, trophy-sized fish, beautiful scenery and incredible geology.

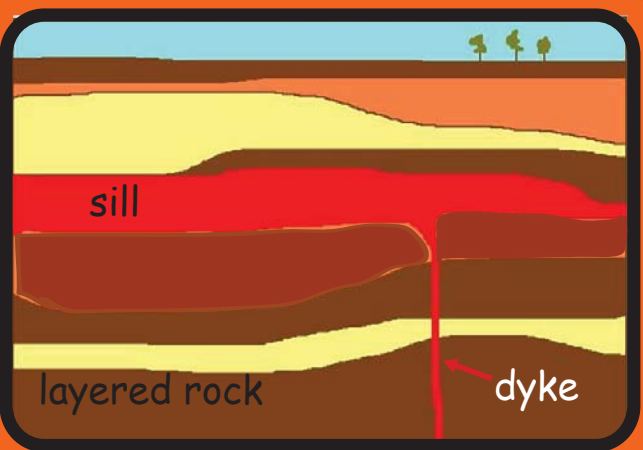
The numbered dots represent areas referred to in the poster.

Lutsel K'e,

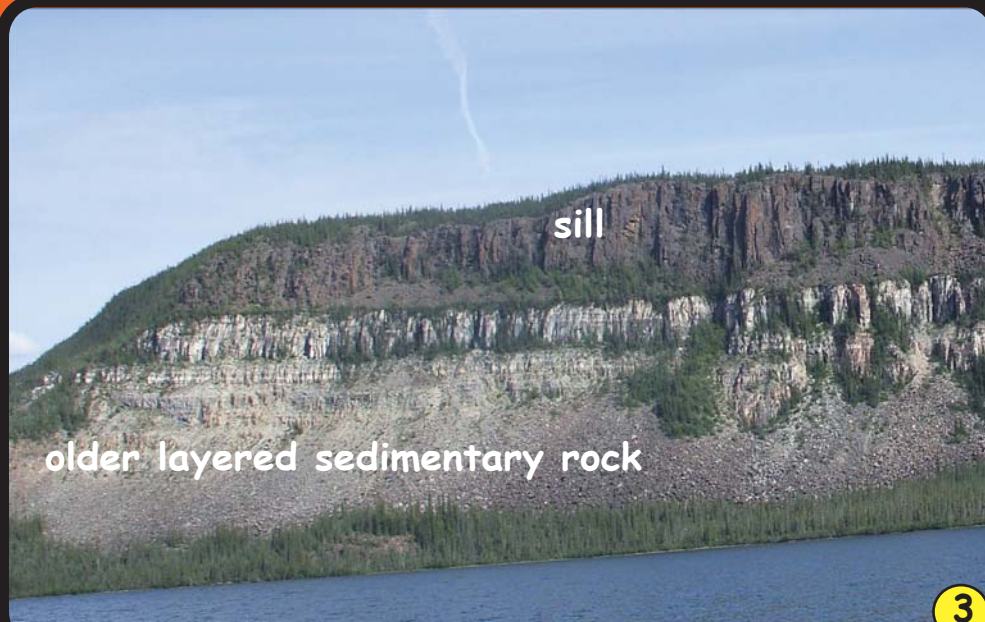
Northwest Territories

Intrusive Rocks

Intrusive rocks form when magma below the surface of the earth cools and crystallizes. When magma intrudes between layers of older rocks and solidifies, the rock that forms is called a **SILL**. Sills parallel beds (layers) of the surrounding country rock. In the East Arm of Great Slave Lake, the magma intruded between sedimentary layers of limestone, sandstone and conglomerates. These sills are composed of gabbro, a dark coloured, coarse-grained, iron rich igneous rock.



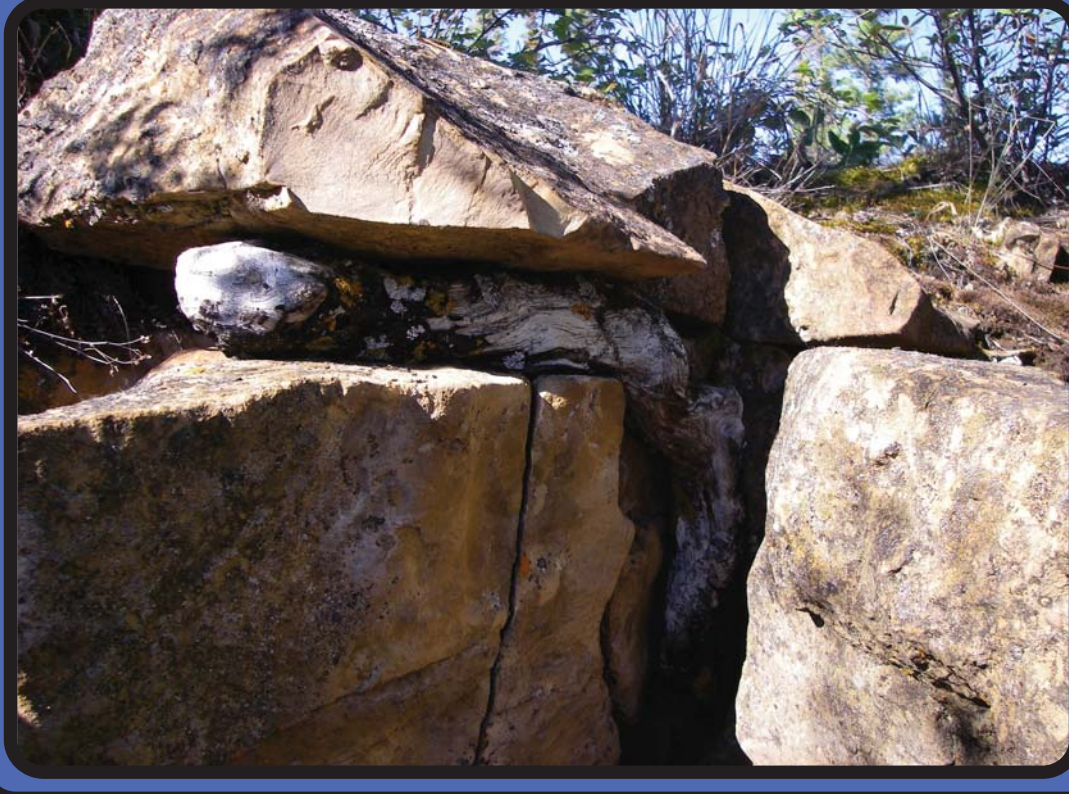
If the magma intrudes and cuts across older rock the resultant rock is called a **DYKE**, these are generally smaller in dimension than sills and often you can see both sides of the host rock that the dyke has intruded. The dyke is a fine-grained equivalent of gabbro.



These sills and dykes were intruded deep below the earth's surface. Over millions of years these rocks have been uplifted and the layers of rock above have been eroded away by water, wind, and glaciers.

Powerful Plants

Plants can be a powerful force in the break down of rocks. Here a tree has taken advantage of a crack in the rock and enlarged the fracture, exposing more of the rock to the elements and further erosion.



Lutsel K'e Rocks



The community of Lutsel K'e is built on a hill composed of sedimentary rocks (red sandstones and shales).



Volcanic Remains

A volcanic neck is a cylindrical-shaped landform standing above the surface. It is created by magma solidifying in the vent of the volcano. Erosion of the sides of the volcano exposes the neck.



It's a steep and potentially dangerous hike up the crumbling scree slopes of these extinct volcanoes, but between the two eroded volcanic necks you will find the perfect red shale beach to have a shore lunch or skip stones.

Sand Beaches



The sand from these beautiful beaches (located near the historic site of Fort Reliance) was originally deposited by glaciers, and then reworked by the wave action of Great Slave Lake.

Staircase Rocks

When molten magma cools from the outside inward, it contracts, forming cracks and developing a hexagonal joint structure called **columnar jointing**. The growth of the columns is perpendicular to the surface of the magma. After millions of years of erosion, the relief of the rock looks like a staircase.



Conglomerates

This sedimentary rock is called a conglomerate and it forms when boulders and cobbles are cemented together. The boulders and pebbles that make up this conglomerate are from many different sources and all have been rounded and weathered in a high energy environment - perhaps a beach or river system.



Rock History

Rocks record the Earth's history. On this rock face you can see that the rock has been fractured. The fractures were subsequently filled by white vein material. The glacial striae cross the veins (top to bottom of picture), and therefore happened later. The brownish colour is caused by the oxidation of iron minerals that rusted from exposure to the elements. Orange lichen, which have established themselves on the rock face, are contributing to erosion of the rock.



Historic Chimneys

These chimneys are all that remain of the original Fort Reliance. The buildings were erected in 1833 as winter quarters for an overland journey to the Arctic coast by the Arctic Land Expedition led by Captain George Back, R.N.



Fort Reliance consisted of a main house and several separate houses, each with a chimney. An observatory for scientific work was also built here. Other explorers, scientists and adventurers later used the site.

The original builders had to carry the rocks used for the chimney construction from up river since this area is a sand covered plain.

Stromatolite Fossils



The picture above shows the tops of what were cabbage-shaped mounded stromatolites that have been ground down by glaciers.

The centre picture shows small mounded stromatolites overlying laminated limestone in an outcrop that has been tilted and is viewed from the side. Perhaps a change in sea level created an environment favorable for stromatolite growth.

The picture to the right shows elongated stromatolites. The different shapes and sizes of the fossil organisms can provide information about the environment they grew in such as water depth and wave energy.



Stromatolites contributed oxygen to the Earth's atmosphere which provided the basis for future life forms.

Glaciation

Glaciers have shaped the landscape of the East Arm of Great Slave Lake. Rock and soil have been scraped away by the massive ice sheets moving over the land. The exposed rocks are up to 2.7 billion years old, even the youngest rocks found in this area of the NWT are over one billion years old!!



The lines running parallel to the hammer are called striae - these lines are carved by rock debris that was frozen into the bottom of the glacier and dragged along the rocks. The lines indicate the direction of ice movement.



The rocks above have been smoothed and polished by glacial ice and melt water that flowed beneath the ice sheets.



Here, the glacier has ground down the conglomerate including the individual cobbles it is made of. The loose cobbles on the side were weathered out when the cement holding them together was eroded away.

Red Cliff Island

The breathtaking Red Cliff Island highlights some of the most spectacular rock types of the East Arm. This 22 km long island is made up of conglomerates and sandstones which are capped by gabbro sills. The vertical cliffs tower over 500 feet. Eagles may be seen soaring above the island as you pass this incredible site. Perhaps even more incredible, is the knowledge that these rocks formed deep within the earth when molten magma intruded the older layered sedimentary rocks.

gabbro sill

sandstone