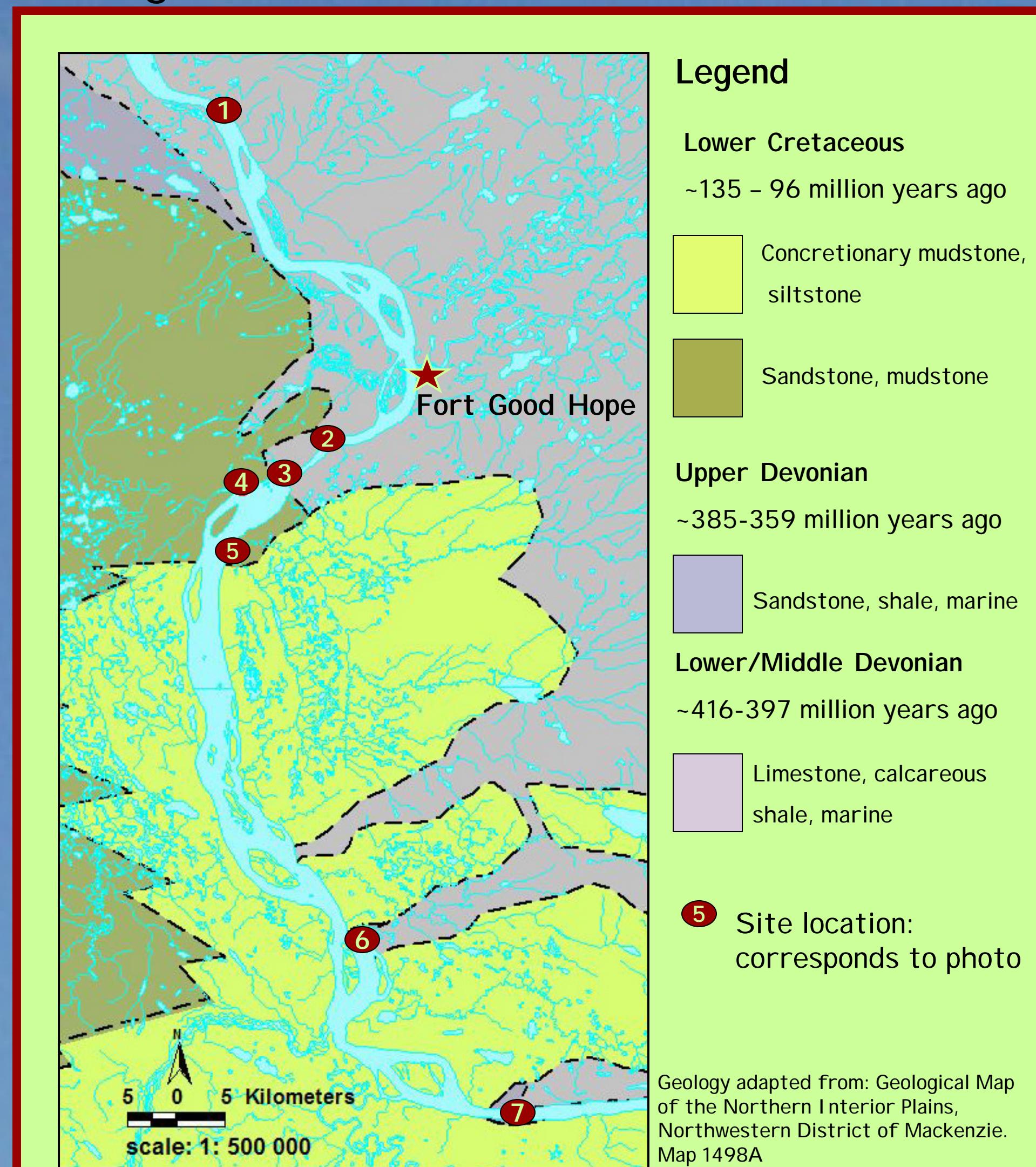


Radili Koe (Fort Good Hope): Community Mapping Poster

Fort Good Hope is situated on the bank of the Mackenzie River, just north of the famous limestone cliffs of the Ramparts Formation. The community is accessible by air, water, and winter road. The Sahtu Dene/Metis community has a population of approximately 900 residents. The area has extensive trapping, fishing and hunting - including both large and small game. The tourism season usually begins after the river ice breaks up in spring, and continues right through to fall.



Old Baldy

This large esker was once the bed of an underground river that flowed within and beneath a glacier.

How did it go bald?

Someone started excavating here for the gravel and sand for road construction material. The esker material is loose and has a steep face, no vegetation has been able to grow back.



Where is all this gravel from?

The gravel, sand and clays found all around Fort Good Hope were accumulated and transported by the glaciers. When the ice melted, these deposits were left behind. The last glaciers retreated approximately ten thousand years ago.

Glacial deposits

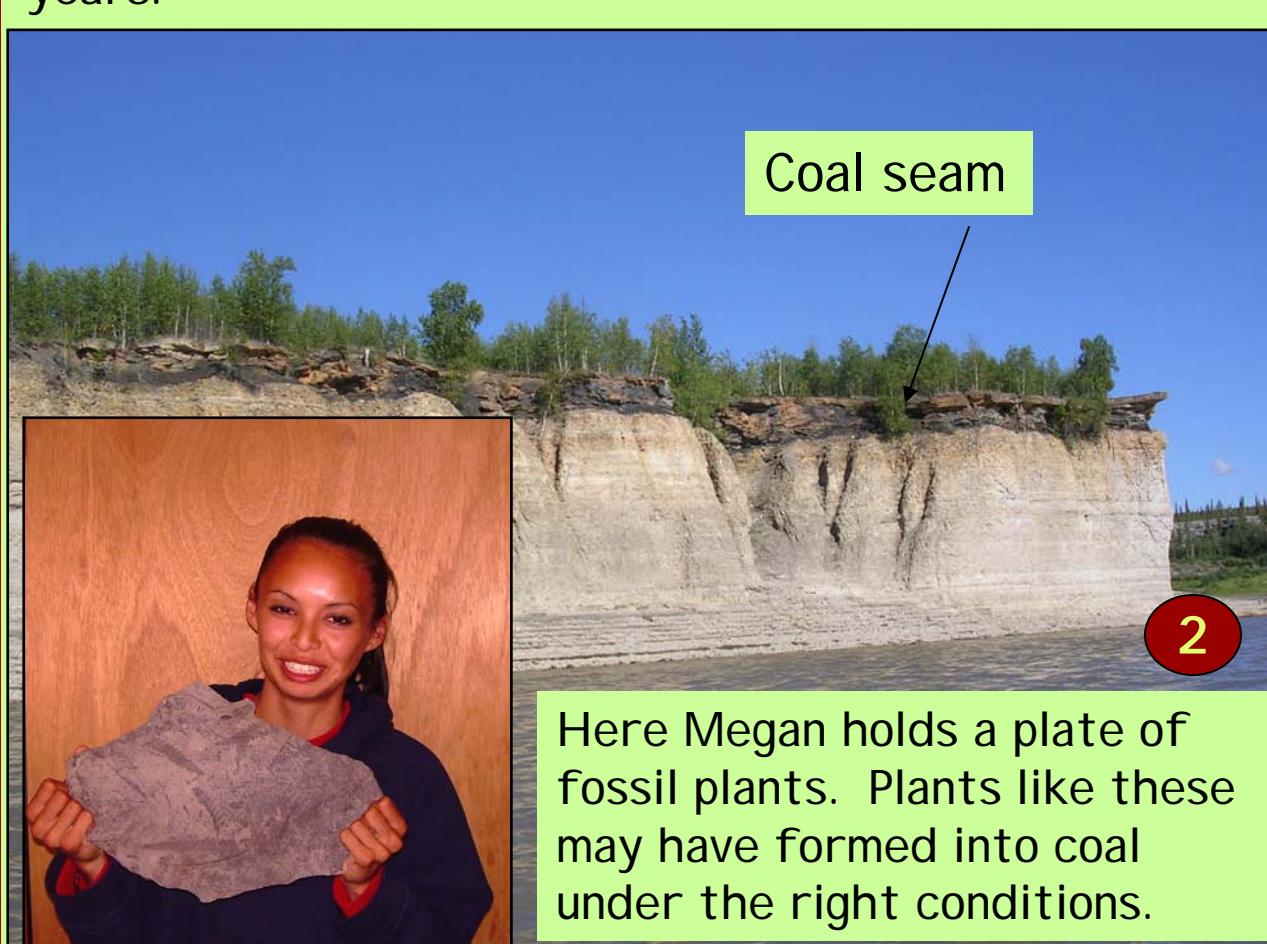
Glacial till is made up of many different types of rock, sand and clay that has been picked up, carried and deposited by glaciers.



Here the boulders and pebbles have eroded out of the river bank, the force of ice and water pressed the rocks into a smooth pavement.

Coal seams

Coal from this seam was used to heat peoples homes in the past. Coal forms when plant material gets buried quickly in sediments in a reduced oxygen environment (so it can't rot). When the plant material is subjected to pressure and temperature deep within the earth it may turn into coal. This process can take millions of years.



Follow the tilt of the bedding planes in these rocks and imagine the direction of the folds that have eroded away. These rocks were folded during crustal deformation as a result of compression during mountain building and are called anticlines and synclines. Synclines have basin shaped folds in which the rock layers are downwardly-convex. The youngest rock layers form the core of the fold. Synclines typically do not trap hydrocarbons (oil and gas) because fluids tend to leak up the limbs of the fold. An anticline is the opposite type of fold, having upwardly-convex layers with old rocks in the core. Anticlines are favoured locations for oil and natural gas drilling as the fuel's low density causes it to migrate upward to the highest parts of the fold, until stopped by an impermeable layer. This location smells strongly of sulphur gases - perhaps leaking from the syncline, or where the layers of the anticline have been eroded away.



Permafrost: When soil and rocks remain frozen all year round it is called permafrost. If the ice within the soil melts, serious problems can result. River banks slump and fall into the river, exposing more permafrost and continuing the cycle. Houses built too close to the rivers edge are in danger of falling in.

To prevent the heat loss from houses melting the permafrost, foundations are built on stilts. This helps to keep the foundations from buckling if the ground below slumps from the melting.



Standing Rocks

Wolverine rock - 20 mile stretch. Here mountain building has folded the rock beds so they are standing steeply on end.



In the picture above, a younger layer of rock was deposited horizontally on top of the upturned rock. Since the top layers are horizontal, we can assume that there was erosion following the folding of the older, bottom rocks.

Ancient Ocean Floor

As you are boating up the river you are actually passing through an ancient ocean floor composed mainly of limestone.

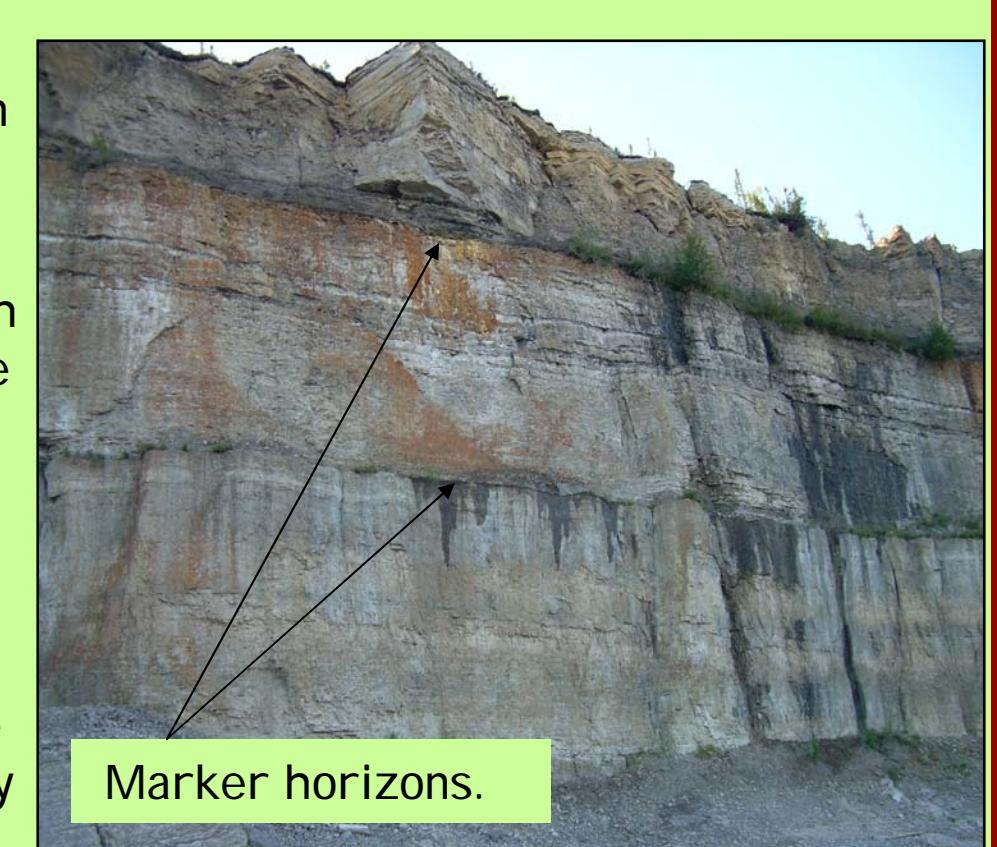
Limestone is a sedimentary rock made up of calcium carbonate that has precipitated out of the sea water. Limestone usually forms in deeper ocean waters. The sandstone and shale that we see represent a shallower environment closer to, and on shore.

The different layers on the sides of the cliffs are actually ancient sea beds, if you look closely you can see sea shells, sponges, and corals which all lived in warm ocean water.

The river water has eroded through these ancient rocks, exposing these spectacular cliffs.

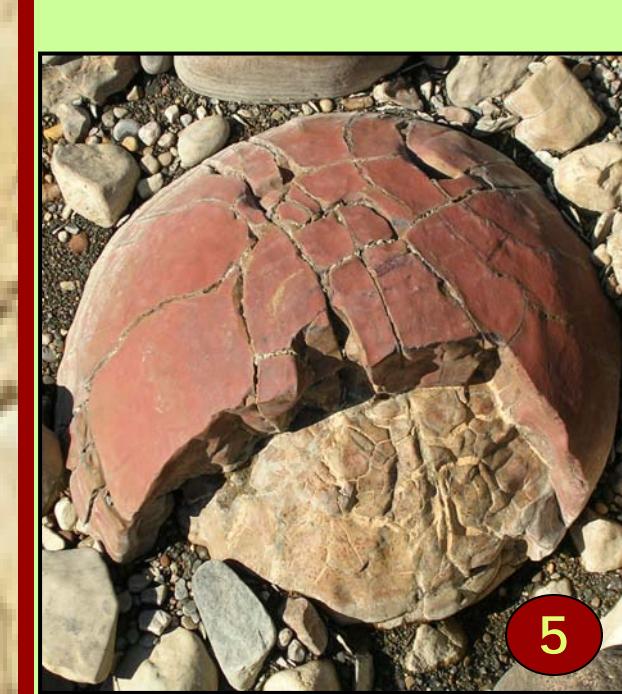
How do we know?

Pick one distinctive bed (marker horizon) and look for the same bed on the other side of the river. The area between has been eroded away by the river.



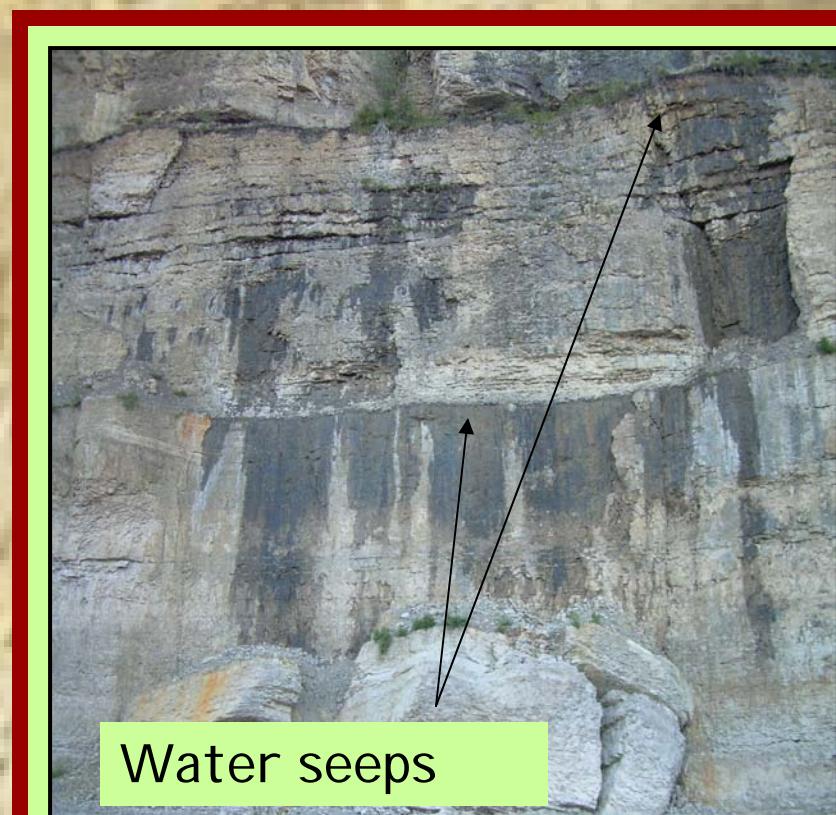
Concretions

These concretions are iron rich rocks that formed when ground water containing dissolved iron compounds were deposited onto a nucleus (perhaps a piece of fossil). Layer by layer, this iron cement builds up over millions of years forming these round shaped rocks.



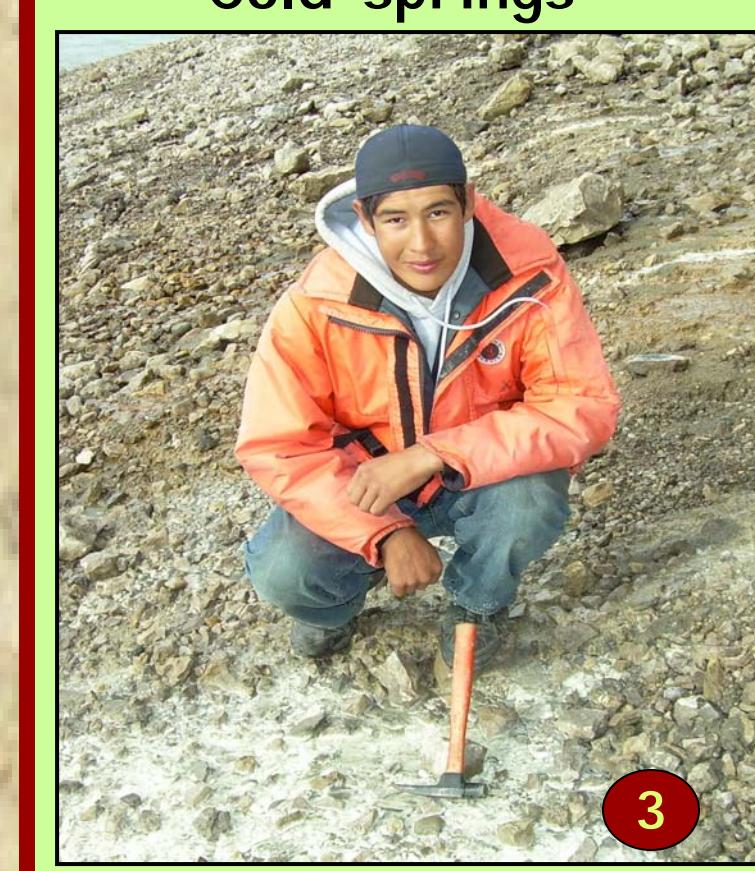
Water seeps

The layers of different rock units are called beds - the upper and lower surfaces of these beds are called bedding planes. Natural springs fed by underground pools of water move between the beds, or through porous rock, and seep out along the cliff edge.



Cold springs

A cold water spring was found below the Rampart Cliffs. The water that flows to the surface through pressure released seeps has dissolved sulphur in it. When the water moves over the rocks the sulphur is re-deposited on the rock surface. The rotten-egg smell is a result of H_2S (Hydrogen Sulphide), a gas similar to natural gas. It may be that anaerobic bacteria, which live in an oxygen free environment, convert some of the dissolved sulphur in the water to H_2S . The gas then travels to the surface where it is released.



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