NORTHWEST TERRITORIES

GEOSCIENCE OFFICE

RESEARCH • ANALYSIS • INFORMATION

Geology along The Canol Heritage Trail

Canada

The Canol Heritage Trail

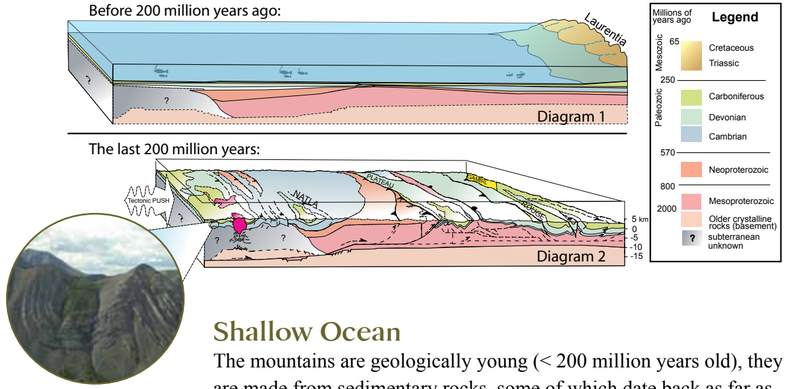
The Canol Heritage Trail is a legacy of the Second World War. It was the service road for a 4-inch diameter pipeline built in 1943 to bring light crude oil from the Norman Wells oil field over the Mackenzie Mountains to the midpoint of the Alaska Highway in the Yukon. The pipeline was completed in 15 months but only used for a year as it was too impractical to maintain after the war.

Location of the Canol Trail (in red).

Building Mountains

During the Mesozoic era (the time of the dinosaurs), a continent-crushing force pushed the flat-lying sedimentary rocks

eastward. First the layers lifted and folded, then they were fractured and began to slide over each other along faults (see Diagram 2). Periodic earthquakes in the Mackenzie Mountains continue to deform along these faults beneath the thickened and tilted stack of sedimentary rocks.



Shallow Ocean

The mountains are geologically young (< 200 million years old), they are made from sedimentary rocks, some of which date back as far as the first multi-cellular life on earth (~800 million years old). At that time a vast shallow sea occupied the area west of the ancient continent called Laurentia (see Diagram 1). Some of the sediments came from what is now eastern North America. Other sedimentary rocks such as limestone formed under seawater and may contain corals.

Fossils

In the warm shallow sea, corals and shellfish flourished. When they died, the sea water replaced the chemical make-up of their shells with minerals such as quartz and calcite, and formed fossils – rockhard relics of the original sea creatures. Hundreds of millions of years later you can see these fossils in rocks that were pushed up to the surface!

abandoned caboose near pump station five

Most of the machinery from the pipeline was salvaged, but rusting truck bodies, rotting buildings and cabooses remain. The trail is breached in places by slides and gullies; bridges and culverts have washed away, but it is still passable on foot or horseback.

abandoned building

The Geology division of Indian and Northern Affairs Canada – NWT Region has joined with the geological staff of the Government of the Northwest Territories' Department of Industry Tourism and Investment (ITI) to form the Northwest Territories Geoscience Office.

Northwest Territories Geoscience Office
Box 1500, 4601-B 52nd Ave
Yellowknife, NT X1A 2R3
Phone: (867) 669-2636 Fax: (867) 669-2725

E-mail: NTGO@gov.nt.ca
www.nwtgeoscience.ca

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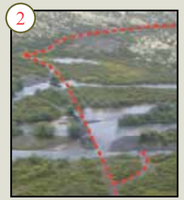
1

The NWT-Yukon border is guarded by jagged peaks of granite.

2

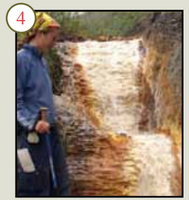


The Canol Trail crosses beneath a tributary of the Tsichu River on the Mackenzie Barrens, a broad upland of willow and dwarf birch shrubs.

3

During the Mesozoic era, a continent-crushing force pushed the flat sedimentary rocks eastward. The layers lifted and folded to slide over each other along faults.

4



Streams resulting from water seeping out of black shale have rusty bottoms from precipitated iron. Wildlife use the mineral salts within these rust coloured deposits to supplement to their diet.

5

The trail winds over Caribou Pass, a broad divide through mountains of orange-brown magne-sium-rich limestone.

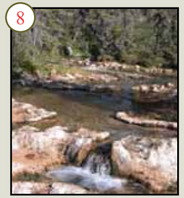
6

Most of the machinery from the pipeline was salvaged, but truck bodies, rotting buildings and cabooses remain. The trail is breached in places but is still passable on foot or horseback.

7

The Godlin River valley provides a narrow, low elevation route for the trail through steeply tilted dolostone and sandstone of the Sayunei Range.

8



Springs near Mile 130 of the Canol Trail produced large white mounds of light grey calcite-rich rock called tufa. These springs are home to rare plant and invertebrate species.

9

The trail descends to the Twitya River, a very challenging river crossing. Snail Warm Springs are circled.

10

Weather elements such as rain, snow, freeze and thaw gradually reduce the height and size of the mountains.

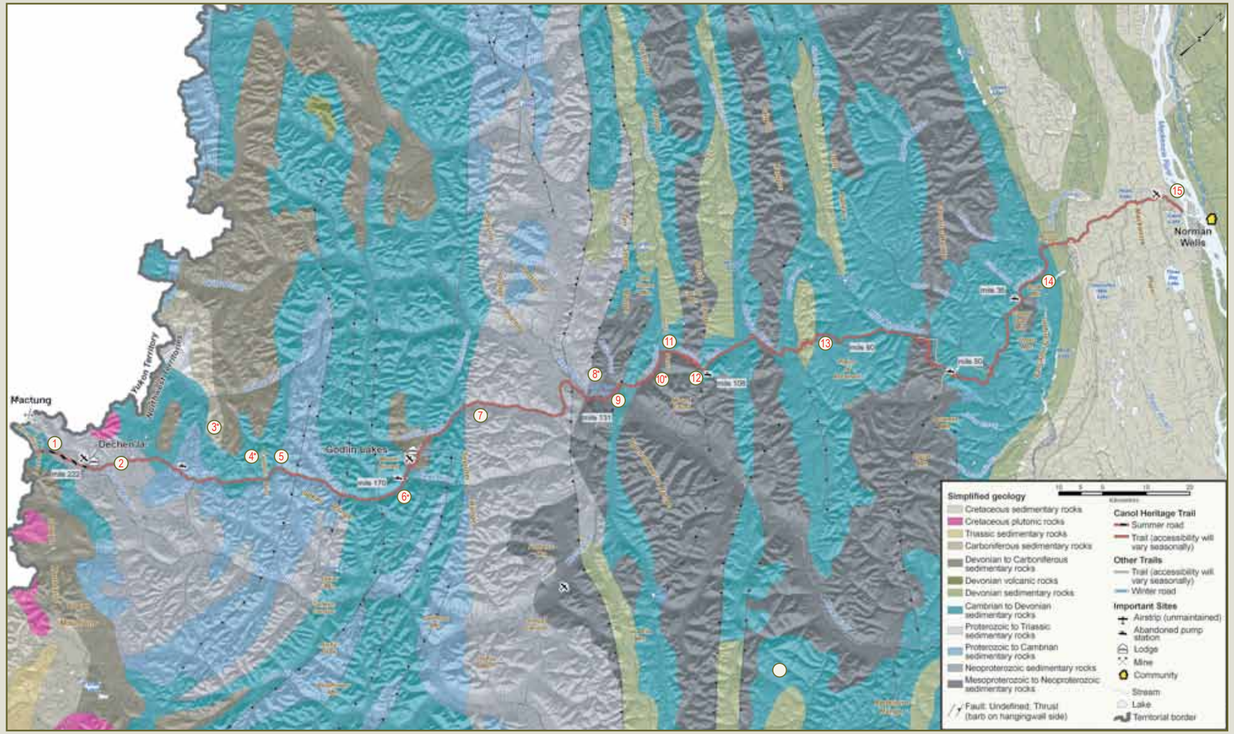
Place name	Language	Meaning
Dechen'la	Kaska	Land of little sticks
Dodo	Slavey	Sheep-nest River, after an isolated hill in a canyon used as a refuge by sheep from wolves
Carcajou	French-Canadian	Wolverine
Godlin	Olde English	'Godly'; has natural order or balance
Keele	English	Joseph Keele, Dominion topographic surveyor; epic 1907-08 trip down river
Macmillan	English	James Macmillan, Hudson's Bay Company factor, named by Robert Campbell who explored the Yukon in 1843
Sayunei	Athapaskan	Rocks of the bighorn
Tigonankweine	Athapaskan	Mountains at the roof of the world

11

At Devil's Pass, the trail crosses 900 million year old sandstone.

12

Thick beds of 300 million year old dolostone lie behind Pump Station Four.



13

On the Plains of Abraham, the Canol Trail crosses flat-lying grey limestone with shell, coral and fish fossils.

14

Dodo Creek was formed by rushing meltwater at the end of the Ice Age. The shifting creek has obliterated the original trail.

15

The Canol pipeline began on the west bank of the Mackenzie River. Artificial island platforms in the river pump oil to Norman Wells on the far shore.