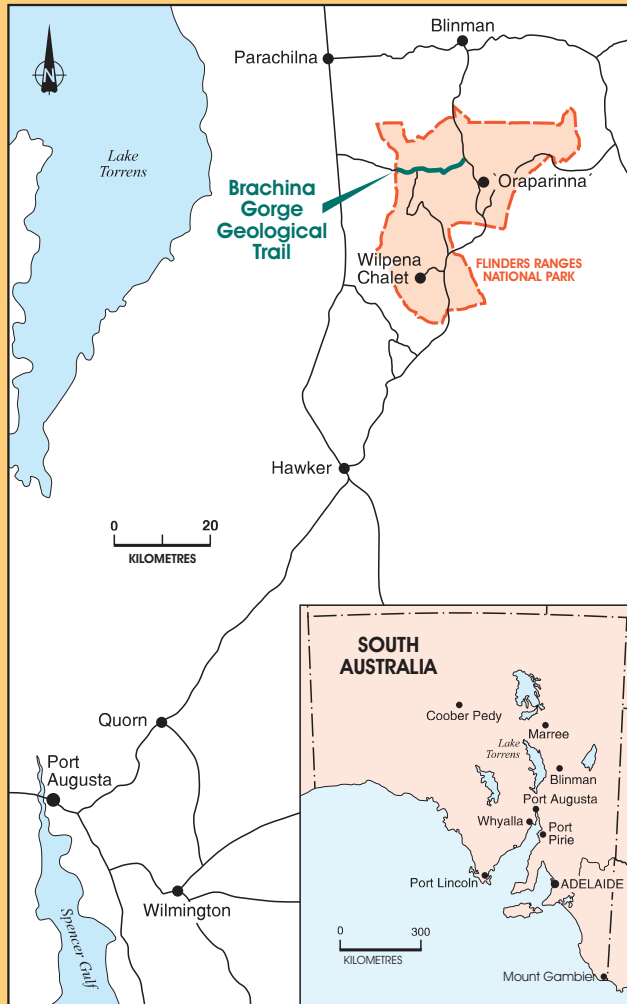


## Access

Brachina Gorge is located in Flinders Ranges National Park, 500 km north of Adelaide. The geological trail is 20 km one way, and is best started from the eastern end. Allow 2 to 3 hours drive time to complete the trail.

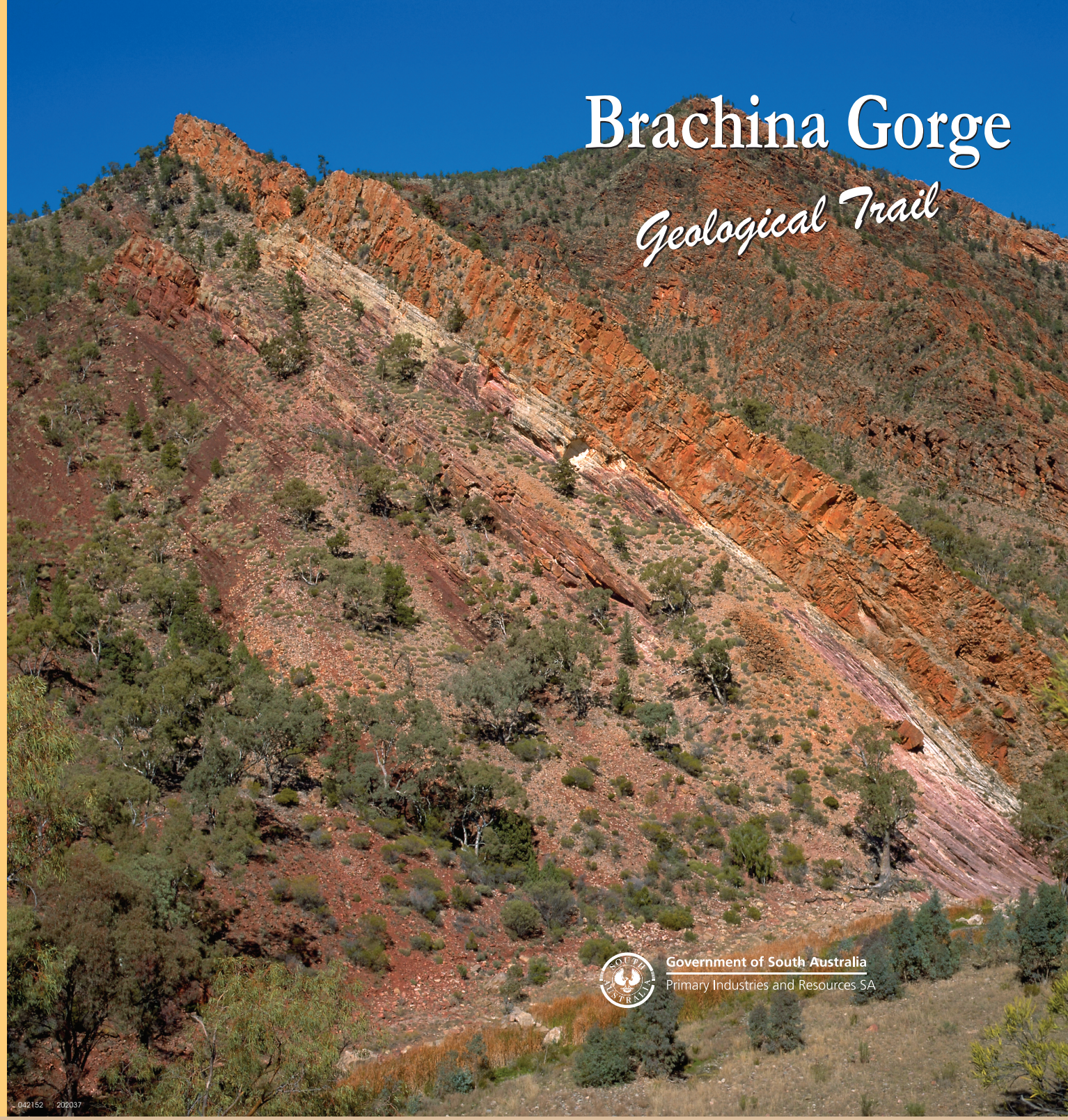
The trail is generally passable to conventional vehicles but the road surface may deteriorate after rain. Camping is permitted in designated areas.



FRONT COVER: Contact between white Rawnsley Quartzite (weathering orange) and underlying red Bonney Sandstone (left), Brachina Gorge. (Photo: Bernd Stoecker)

# Brachina Gorge

## Geological Trail



Government of South Australia  
Primary Industries and Resources SA

# Brachina Gorge

## *A corridor through time*

### Introduction

This colourful and spectacular gorge has long attracted visitors to marvel at its beauty. The gorge was used from 1862 as a commercial route for cartage of copper ore from the Blinman Mine, 35 km to the north. It provided access to the western plains until a road through Parachilna Gorge was established in the 1880s to connect Blinman to the northern railway. The gorge today provides a pathway through the rock sequence which reveals their history — a corridor through time.

### Geology

Rocks which are exposed along the Brachina Gorge Geological Trail were once sediments deposited in a shallow, elongate basin known as the Adelaide Geosyncline. These sediments were transported by rivers and at times by glaciers, and deposited on the seafloor between 650 and 500 million years ago. The area was flooded by the sea for much of that 150 million year period, during which the sea level rose and fell many times.

About 500 million years ago, movements in the Earth's crust caused the pile of sediments (now converted to sedimentary rocks) to be compressed, folded and pushed up into a mountain range much higher than we see today. This mountain building took place over many millions of years. Large fold structures such as Wilpena Pound were formed during that time. Weathering and erosion have subsequently reduced the height of the original mountain range by several kilometres, leaving the present ranges and exposing the edges of the folded layers.

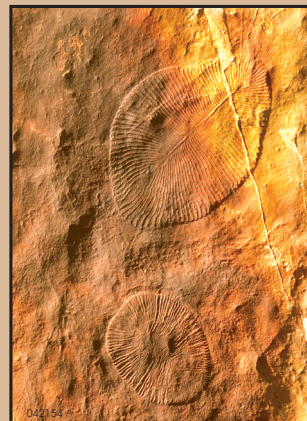
### Geological Trail

As you proceed along the trail you will pass across the edges of these exposed layers, which become younger in age the further you drive west, and cover nearly 150 million years of Earth history. The rocks provide one of the most complete sedimentary records in the world for this age. They also provide a unique record of environments, events and climatic conditions at the time of deposition. In particular, the rocks contain clear evidence of the way life evolved during this time.

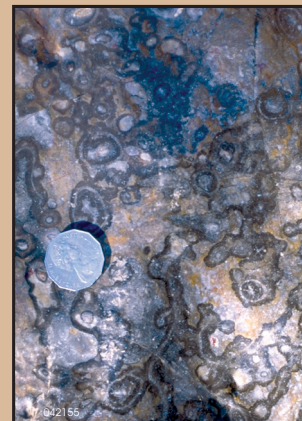


*Stromatolite in the Trezona Formation; these layered domes of fossil algae represent some of the earliest evidence of life on Earth.*

*Dickinsonia costata, one of the oldest known animal fossils, in the Rawnsley Quartzite.  $\times 0.2$*



*Fossilised skeletons of archaeocyaths in the Wilkavillina Limestone.*

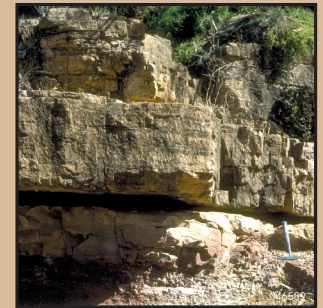


*Coarse cross-bedding in the Bonney Sandstone, indicative of the sand having been deposited in a shallow water environment.*

*Striated pebble of basalt in diamictite, upper part of the Elatina Formation near Trezona Bore.*



*Laminated dolomite of the Nuccaleena Formation overlying diamictite of the Elatina Formation, Enorama Creek.*



*Horizontal sediments, deposited in a lake perhaps 100 000 years ago, overlying dipping shale of the Brachina Formation.*



# Brachina Gorge Geological Trail

- 12 Wirrealpa Limestone**  
About 520 million years old.  
Grey limestone deposited in a shallow sea; contains evidence of abundant animal life.
  - Billy Creek Formation**  
About 525 million years old.  
Red shale and siltstone formed in a shallow sea.
  - 11 Wilkawillina Limestone**  
About 530 million years old.  
Reef-type limestone formed in a warm, shallow sea; contains coral-like archaeocyaths.
  - 10 Parachilna Formation**  
About 540 million years old. Shallow-water, near-shore sandstone and siltstone with abundant worm burrows.
  - 9 Rawnsley Quartzite**  
About 550 million years old. Shallow-water, near-shore white quartzite containing evidence of some of the first animals on Earth.
  - 8 Bonney Sandstone**  
About 560 million years old.  
Red sandstone deposited in shallow water.
  - 7 Wonoka Formation**  
About 570 million years old.  
Greenish grey limestone and siltstone formed in a deep sea which became shallower towards the end of deposition.
  - 6 Bunyeroo Formation**  
About 580 million years old.  
Red shale and siltstone formed in deep water.
  - 5 ABC Range Quartzite**  
About 590 million years old.  
White quartzite deposited in shallow water.
  - 4 Brachina Formation**  
About 600 million years old.  
Purple-brown siltstone and shale formed in a deep sea which became shallower.
  - 3 Nuccaleena Formation**  
About 610 million years old.  
Buff dolomite formed in warm shallow water.
  - 2 Elatina Formation**  
About 620 million years old.  
Sandstone and tillite of glacial origin.
  - 1 Trezona Formation**  
About 630 million years old.  
Very shallow water limestone and siltstone containing stromatolites which provide evidence of early life on Earth.
- Enorama Shale**  
About 640 million years old.  
Grey-green shale formed in quiet water.

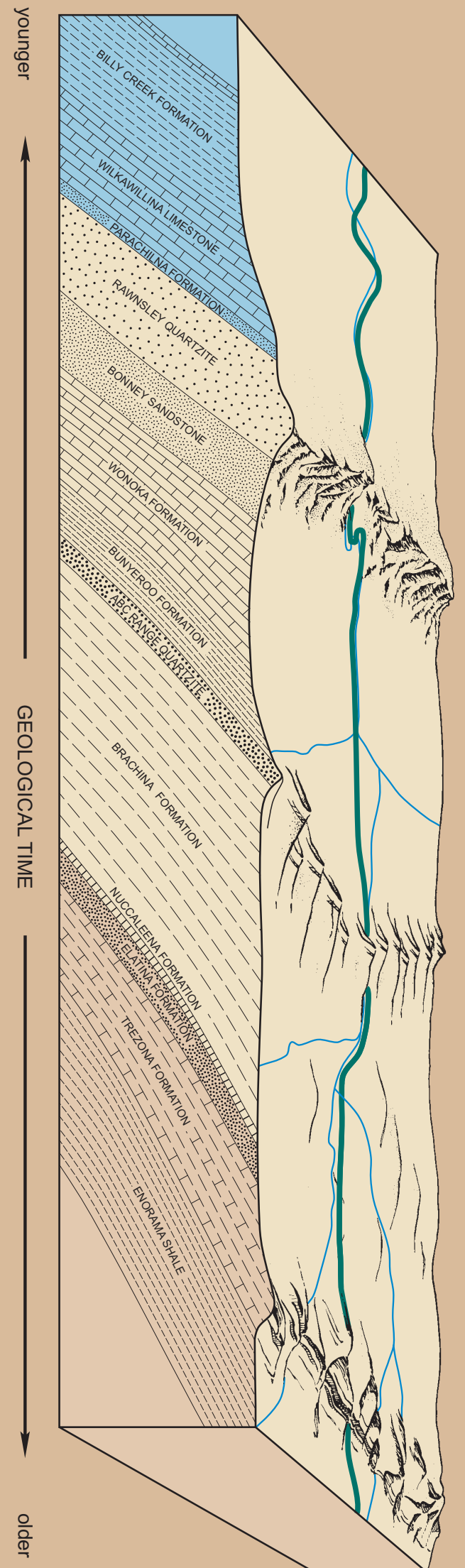
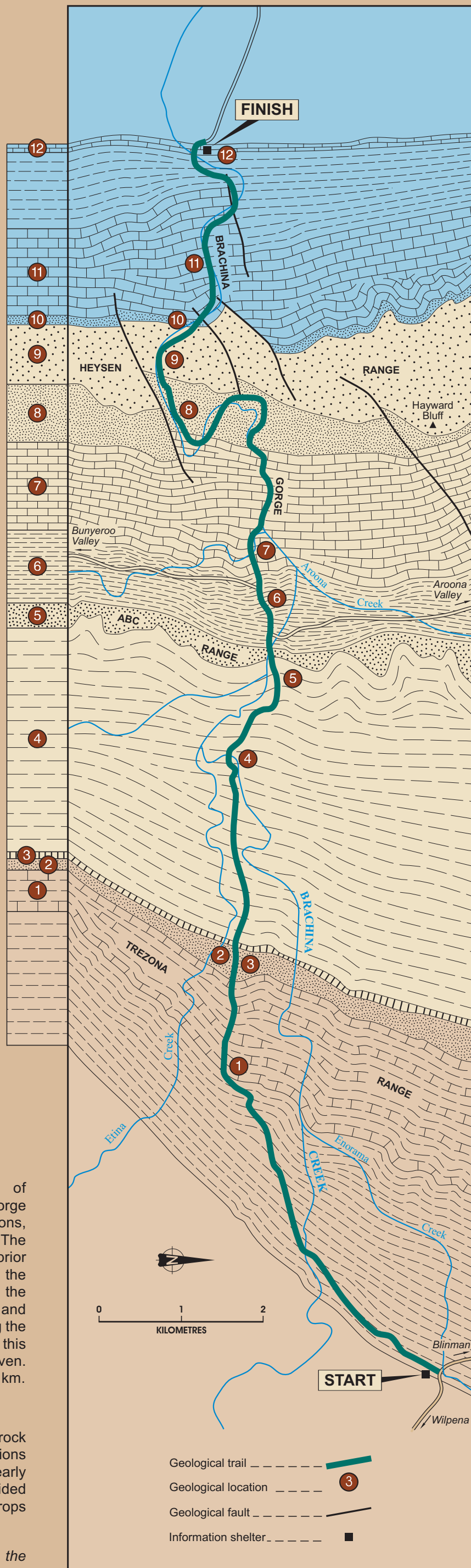
## Geological Column

The column above shows the succession of formations (rock units) along the Brachina Gorge Geological Trail. The names of the formations, together with their common rock types, are given. The formations are shown horizontally as they were prior to folding, with the oldest at the bottom and the youngest at the top. The sedimentary rocks of the Flinders Ranges were deposited between 800 and 500 million years ago. The formations seen along the Brachina Gorge Geological Trail form part of this succession. An estimate of their ages is given. The total thickness of the rock sequence is about 9 km.

## Geological Locations

The map shows the surface distribution of various rock formations along the trail. Twelve different formations will be seen; the boundaries between each are clearly signposted. Information on each formation is provided at the numbered locations shown. Several outcrops are described in more detail.

*The geology is simplified from Geology of the Flinders Ranges National Park 1:75 000 map.*



## Geological Cross-section

About 500 million years ago, forces in the Earth's crust folded the originally horizontal rock layers into a broad fold 50 km across. The western part of this fold is exposed along Brachina Gorge.