The study tried to answer questions regarding the stratigraphy, structure and depositional environment of the Strzelecki Group based on its unique coastal outcrops near the Wonthaggi township, west Gippsland. The outcrops were mapped and logged in detail, depositional system was interpreted while inferred major faults were determined from field observations and assisted by Google Earth and magnetic images. Unmanned Aerial Vehicle (UAV) imaging of the fracture dominated platforms resulted in high-resolution orthophoto generation. Due to the lack of obvious stratigraphic marker horizons, vitrinite reflectance was used to determine fault displacements. The subsurface geology was mainly based on available access and bore reports from the Wonthaggi coalfield.

The outcrops can be described as a succession of fluvial channel sandstones deposited within a braided river system and flood-plain mudstones and coal. Inland, north of the Kogwak Fault, the succession is dominated by sand bodies of a high energy river system. To the south, although sandstone beds are common, mudstones with thin coal beds are prominent and locally make up over half of the stratigraphy. Observations of the sharp contacts are evidence for high fluctuation in energy of environment. The types of plant material indicate a humid climate.

Although no sediment section greater than 200 m thick is exposed in any one fault block, a total thickness of about 1500 m is inferred to be exposed along the coastline. However, because of the amount of faulting and probable repeated sections, the true thickness of the Strzelecki Group exposed is much less than this number.

Structural analysis of the faults/fractures shows that they occur in three distinct azimuth based sets, pertaining to different phases of regional extension and compression. Four generations of faulting were determined based on fault geometries and crosscutting relations. These are Early Cretaceous, E-W striking normal faults; Late Cretaceous, NW-SE striking normal faults; Tertiary, NNE-SSW striking reverse faults; and later Tertiary, reactivated NW striking reverse faults. Fault-joint relations were determined to be syn-developmental as fracturing exhibiting Mode-I geometries related to extensional normal faulting and compressional reverse reactivation.

An estimation of the amount of displacements shows the largest faults have displacements of up to 400 m and show both normal and reverse movement.

**KEYWORDS**
Gippsland Basin, Wonthaggi area, Early Cretaceous, Strzelecki Group, Fluvial sediments.