2.2. Buntsandstein Formation

Authors: Stainier, 1907, 1911, 1943; Antun, 1954; Legrand, 1961; Legrand in Delmer, 1963; Wouters & Vandenberghe, 1994; Langenaeker, 2000.

Description: The Buntsandstein Formation encompasses all predominantly red-coloured and sandy siliciclastic sediments, assigned to the Lower Triassic.

The overall regressive trend , introduced by the underlying Helchteren Formation , and characterised by a coarsening upward trend , is continuing . The Buntsandstein Formation is deposited in a floodplain with gradual change from fining upwards channel fills to coarse flood sheets with intercalated clay-playas . Remarkable is the systematic succession of fining upward cycles with stable thickness, varying between 8-15 m, regardless of differences in sand-clay content. This may be indicative for the interaction between a constant subsidence regime and allocyclic sedimentation.

Three members have been distinguished, from bottom to top:

1. Gruitrode Member: alternation of red thick-bedded siltstones to silty claystones and sandstones of varying granulometry , including conglomerates, occasionally bleached; top at last siltstone;

2. Bullen Member: red, often bleached sandstones of varying granulometry, including conglomerates (pebbles can be either of synsedimentary pedogenetic origin or allochtonous and similar in composition to the basal Permian conglomerate, probably derived from the Eifel region in Germany);

3. Bree Member: consisting of three parts: a lower clay stone-dominated part composed of thin-bedded claystones and sandstones rich in calcareous cements; a middle sandstone-dominated part composed of mostly fine to medium grained sandstones; the top part has not been recently traversed in boreholes but contains more claystones.

Boundaries: base: concordant from Helchteren Formation; top: disconformity with Rot Formation (contact not observed) .

Stratotype: Defined for the members of the Buntsandstein Formation:

well KB 172, Gruitrode-Ophovenderheide, for Gruitrode Member ;

well KB121, Meeuwen-Bullen, for Bullen Member;

well KB 201, Bree, for Bree Member.

Area: northeastern Campine basin and Roer Valley Graben; erosion due to the Cimmerian Uplift of the Brabant Massif has removed these deposits from the adjoining areas in the Campine Basin and eastern part of the Brabant Massif . All Triassic deposits are characteristic for the Germanic Facies Province, extending over the former Southern Permian Basin (Ziegler, 1990).

Thickness: Max . preserved thickness 490 m in drilled part of Campine Basin:

Bree Member min 160 m (top eroded);

Bullen Member 230 m;

Gruitrode Member 100 m.

In the Roer Valley Graben (well KB64) total thickness may be only 430 m.

Age: Lower Triassic, Scythian (no chronostratigraphic or biostratigraphic dating available).

Remarks: Although the name is derived from the lower unit in the tripartite subdivision of the Germanic Trias, the stratigraphic boundaries may diverge.

The Buntsandstein Formation in the Campine basin largely corresponds to the Lower Germanic Trias Group of the Dutch Stratigraphic Nomenclature . The Gruitrode and Bullen Members correspond to the Nederweert Sandstone member of the Lower Buntsandstein Formation; the Bree Member corresponds to the Rogenstein Member of the Lower Buntsandstein Formation and to the Volpriehausen , Detfurth and Hardegsen Formations. A further subdivision of the Bree Member may be feasible but has not been attempted because of lack of data.

The Gruitrode, Bullen and Bree Members were originally described in open nomenclature as Lower, Middle and Upper Buntsandstein respectively (cf. Dusar et al., 1987).