Kempen Diest Member (Diest Formation)

Unit name: Kempen Diest Member

Hierarchical unit name: Diest Formation

Type: Member

Code: DiKe

Author(s): Houthuys Rik, Adriaens Rieko, Goolaerts Stijn, Laga Piet, Louwye Stephen, Matthijs Johan, Vandenberghe Noël & Verhaegen Jasper

Alternative names: formerly part of the at the time not yet subdivided Diest Formation sensu De Meuter and Laga (1976) after Dumont (1839)

Origin of the name: Kempen region in Antwerp and Limburg provinces.

Status: Formal

Date: 01/05/2022

How to refer: Houthuys, R., Adriaens, R., Goolaerts, S., Laga, P., Louwye, S., Matthijs, J., Vandenberghe, N. & Verhaegen, J., 2023. The Kempen Diest Member, 01/09/2023. National Commission for Stratigraphy Belgium. http://ncs.naturalsciences.be/lithostratigraphy/Kempen-Diest-Member

Characterizing description

The member is created to accommodate the poorly sorted medium to coarse, very glauconiferous, greyish green Diest sand that is mostly found in subcrop in boreholes in the northern part of the Kempen and in northern Limburg (Houthuys et al., 2020). Glauconite content varies from 25% to 60%. The coarse beds often contain a subpopulation of 0.5 to 2 mm (sub)angular quartz grains. In the vertical direction, grain size is either constant or coarsening upwards. The sand is most often homogenized by bioturbation. In cores, white burrow traces devoid of glauconite can be seen. No clear primary lamination has been reported in this member. The sand of this member has a loose packing. The sand is often non-calcareous.

On seismic profiles, this member shows large-scale clinoforms with low slope angles (usually around 2%, locally in north Limburg up to 8%), prograding to NW. In north-Limburg, also stacking of aggrading beds is observed (De Batist & Versteeg, 1998). The clinoforms are interpreted as the slope deposits of a prograding marine delta.

Type section, type locality, type borehole, type CPT and/or type geophysical borehole

A cored borehole in Mol or Dessel, e.g. from the 'ON' series of boreholes drilled by NIRAS such as ON-Dessel-2 or ON-Dessel-5, can be proposed as type section (remains to be done).

Description upper boundary

The upper boundary is a near-planar truncation surface, covered by the Kasterlee Formation, the formation that stratigraphically follows the Diest Formation. Locally, inside the Roer Valley Graben, the overlying deposit is the Inden Formation (Louwye & Vandenberghe, 2020). Near Antwerpen, the overlying deposit is the Kattendijk Formation.

Description lower boundary

The lower boundary is not yet well-defined. There is a gradual downwards transition to the Dessel Member. For practical reasons, the modal grain size of 200 µm is used to separate it from the Dessel Member. Possibly, in the SE part of the extent, the member overlies the Hageland Diest member.

Thickness

The thickness is difficult to establish as the lower boundary is not well defined. The thickness is several 10s of metres and reaches more than 100 m in the Roer Valley Graben and near the Dutch border.

Occurrence

The member occurs in the central and north Kempen region. The western border is a few km east of the city of Antwerpen and the southern border is approximately along a line Lier – Herentals – Olmen – southwest border fault of the Roer Valley Graben. However, awaiting a clear description of the transition to the Hageland Diest and Borsbeek/Deurne members, the borders are at present poorly defined.

Regional correlations

The member boundaries are not (yet) well defined. The Kempen Diest Member is lateral to the Hageland Diest Member, yet was deposited in a lateral depositional phase (Vandenberghe et al., 2014).

Age

Late Miocene: late Tortonian to earliest Messinian, biochron DN9. North of Antwerpen, biochron DN10.

Dataset

Data in the LIS are part of the DOV-Neogene data collection, including links to the GSB-collection data sheets: https://www.dov.vlaanderen.be/data/opdracht/2020-021774.

Subset of the Diest Formation: https://www.dov.vlaanderen.be/data/opdracht/2020-021774

References

De Batist, M. & Versteeg, W.H., 1998. Seismic stratigraphy of the Mesozoic and Cenozoic in northern Belgium: main results of a high-resolution reflection seismic survey along rivers and canals. Geologie en Mijnbouw, 77, 17–37. https://doi.org/10.1023/A:1003446611678

De Meuter, F. & Laga, P., 1976. Lithostratigraphy and biostratigraphy based on benthonic foraminifera of the Neogene deposits in Northern Belgium. Bulletin Belgische Vereniging voor Geologie/Bulletin de la Société belge de Géologie, 85, 133–152.

Dumont, A., 1839. Rapport sur les travaux de la carte géologique pendant l'année 1839. Bulletins de l'Académie royale des Sciences et Belles-Lettres de Bruxelles, 6/2, 464–485.

Houthuys, R., Adriaens, R., Goolaerts, S., Laga, P., Louwye, S., Matthijs, J., Vandenberghe, N. & Verhaegen, J., 2020. The Diest Formation: a review of insights from the last decades. Geologica Belgica, 23/3-4, 199-218. https://doi.org/10.20341/gb.2020.012

Louwye, S. & Vandenberghe, N., 2020. A reappraisal of the dinoflagellate cyst biostratigraphy of the upper Miocene in the Maaseik well 49W0220. Geologica Belgica, 23/3-4, 289-295. https://doi.org/10.20341/gb.2020.013

Vandenberghe, N., Harris, W.B., Wampler, J.M., Houthuys, R., Louwye, S., Adriaens, R., Vos, K., Lanckacker, T., Matthijs, J., Deckers, J., Verhaegen, J., Laga, P., Westerhoff, W. & Munsterman, D., 2014. The implications of K-Ar glauconite dating of the Diest Formation on the paleogeography of the Upper Miocene in Belgium. Geologica Belgica, 17, 161–174.