# Antwerpen Member (Berchem Formation)

**Unit name:** Antwerpen Member

**Hierarchical unit name:** Berchem Formation

**Type:** Member

**Code:** BcAn

**Author(s)**:

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- Modification of: De Meuter & Laga (1976)

**Alternative names:** /

**Origin of the name**: The origin of the name of the unit is discussed in De Meuter & Laga (1976) and Louwye et al. (2020).

**Status:** Formal

**Date**: 01/05/2022

**How to refer:** Louwye, S., Adriaens, R., Deckers, J., Everaert, S., Vandenberghe, N. & Verhaegen, J., 2023. The Antwerpen Member, 01/09/2023. National Commission for Stratigraphy Belgium. http://ncs.naturalsciences.be/lithostratigraphy/Antwerpen-Member

## Characterizing description

The Antwerpen Member consists of dark green to blackish, medium fine-grained, slightly clayey and very glauconitic sand with a mode of 219 µm ± 61 µm. The dispersed clay content is 3.7 ± 2.3% and the D90 of the grain size distribution is 352 ± 102 µm (De Meuter & Laga, 1976; Verhaegen, 2020). Characteristic are shell layers strongly dominated by Glycymeris baldii with a varying thickness. Some of these shell beds can be traced continuously across the entire type area (Deckers & Everaert, 2022). Layers with phosphatic concretions, friable sandstones, bones and shark teeth are present towards the base of the member. No clear basal gravel is present. The glauconite content ranges from 28% to locally as high as 85% and is on average 47%, which is the highest amount in any unit in the Campine Basin (Adriaens, 2015; Adriaens & Vandenberghe, 2020). The Antwerpen Member contains mostly authigenic glauconite (Vandenberghe et al., 2014; Odin & Kreuzer, 1988).

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

According to De Meuter & Laga (1976), the type locality of the member is the city centre of Antwerp. The original, and now disappeared, type section of the member was described during the excavations works for a fort at Antwerp (Nyst, 1845). Nowadays no permanent outcropping type section for the member exist. The lithology of the member was described in following temporary outcrops in the Antwerpen area (see Figure 0-1 for a synthetic overview):

Antwerpen – Berchem Station AM (De Meuter et al., 1976)

Antwerpen – Borbeeksepoort II BP (De Meuter et al., 1976)

Borgerhout – Stenen Brug I SB (De Meuter et al., 1976), revised by Deckers and Everaert (2022)

Borgerhout – Rivierenhof XI BR (De Meuter et al., 1976) correlated to CPT GEO-07/154-S11 by Deckers and Everaert (2022)

Antwerpen – Kievitstraat II, V, VI AK (De Meuter et al., 1976), revised by Everaert et al. (2020)

Posthofbrug (Louwye et al., 2010) correlated to CPT GEO-68/101-SVII by Deckers and Everaert (2022)

Posthofbrug 2-3 (Hoedemakers & Dufraing, 2018)

Tweelingenstraat (Everaert et al., 2020)

Argenta (Everaert et al., 2020)

Post X (Everaert et al., 2020)

## Description upper boundary

In the greater Antwerp area, the member is unconformably covered by the Deurne/Borsbeek members of the Diest Formation (upper Miocene), the Pliocene Kattendijk and/or Lillo formations, reworked Pliocene deposits or the Quaternary (De Meuter et al., 1976). Often, a succession of compact Glycymeris shell beds forms the top of the Antwerpen Member (S3 in Deckers & Everaert, 2022), probably due to its stronger resistance against erosion.

## Description lower boundary

The Antwerpen Member rests unconformably on the Kiel Member in the Antwerp area. This boundary displays the geometry of an unconformity, as the upper part of the Kiel Member disappears to the north of Antwerp (Louwye et al., 2000; Everaert et al., 2020). The basal part of the Antwerpen Member has a denser texture due to its finer admixture, with a slightly higher clay and silt content, in contrast to the Kiel Member. This locally gave rise to the development of load casting structures in the base of the Antwerpen Member. Locally, large lithified Ophiomorpha burrows are concentrated just below the base of the Antwerpen Member.

## Thickness

Based on (sometimes lithostratigraphically revised) outcrop drawings by De Meuter et al. (1976) and correlations with nearby CPTs, the Antwerpen Member has an approximate thickness of 7 m in the type area.

## Occurrence

Deposits coeval with the Antwerpen Member are recorded in several boreholes north (Antwerp Campine area) and east (Campine area) of the type area reaching a maximum thickness of c. 5 to 10 m (Louwye et al., 2020).

## Regional correlations

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## Age

The planktonic foraminifers from the Antwerpen Member indicate the presence of the NPF12 Globogineroides trilobus Zone to the NPF13 Globorotalia praescitula Zone defined by Spiegler et al. (1988), and point towards a late Burdigalian to Langhian age. The benthic foraminifera from the Antwerpen Member are indicative for the mid-Miocene Uvigerina tenuipustulata – Elphidium inflatum Assemblage Zone (De Meuter & Laga, 1976), while the calcareous nannoplanton proposes a correlation with the late Burdigalian to Langhian NN4 Zone (Martini & Müller, 1973). Dinoflagellate cyst analysis demonstrates the presence of the Labyrinthodinium truncatum Zone, the Unipontidinium aquaeductus Zone and the Achomosphaera andalousiensis Zone and suggests

deposition between 15.97 Ma and 12.8 Ma (Langhian – mid-Serravallian) (Louwye et al., 2000) (Figure 0-2). The radiometric datings of glauconites from the Antwerpen Member give a K-Ar age of 20 Ma and a Rb-Sr age of 18.5 Ma to 21.5 Ma (Odin & Kreuzer, 1988), i.e. a latest Aquitanian to mid-Burdigalian age. Vandenberghe et al. (2014) and Adriaens (2015) attribute the diverging age assessment to the presence of reworked glauconite pellets.

## Dataset

Data in this LIS are part of the DOV-Neogene data collection, including links to the GSB-collection data sheets.

Subset of the lower and middle Miocene: https://www.dov.vlaanderen.be/data/opdracht/2020-022192

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## Annexes

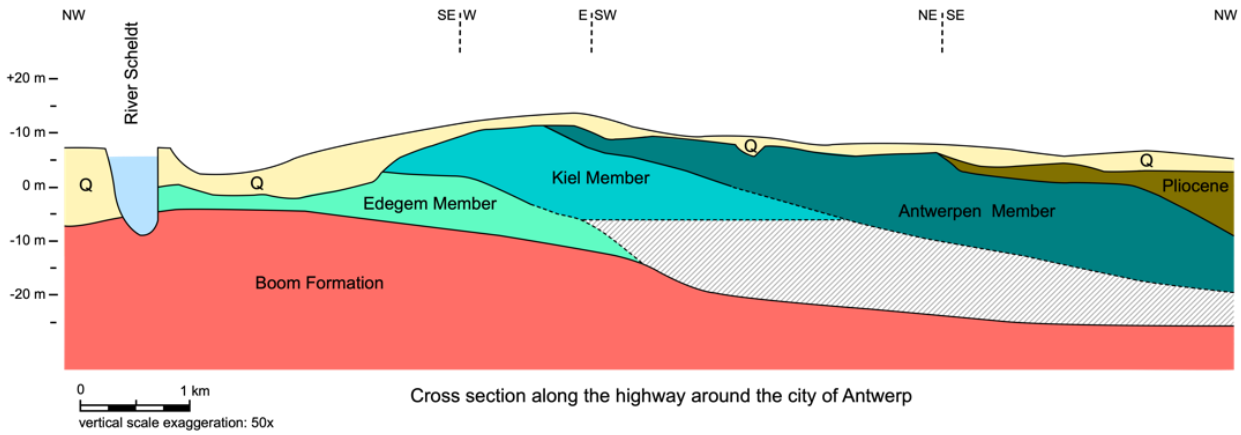


Figure 0-1. Geological cross-section of the Berchem formation in the type area. See Louwye et al. (2020) for more information.

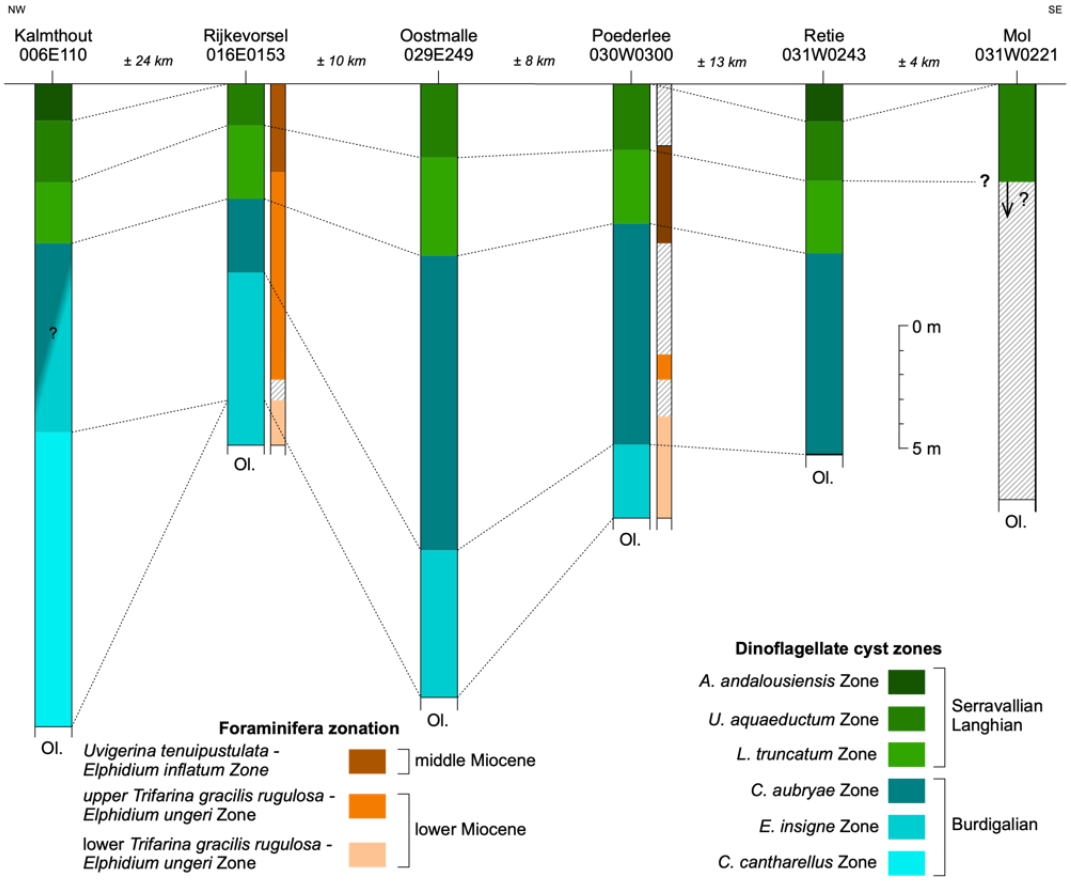


Figure 0-2 Distribution of lower and middle Miocene deposits in the Antwerp Campine area. See Louwye et al. (2020) for more information.