

## 2.5.3. Maaseik Member - HsMa

**Authors:** Steurbaut (1998).

**Description:** this marine unit consists mainly of pale grey marly clay. It may contain molluscs as well as plants remains and pyritised tubulations. In the shaft of the Eisdien Colliery (064W0210), located very close to the type-section in the Waterschei borehole (063E0222), the Maaseik Member is made up of thin layers of about 10cm thick with very regular, nearly horizontal, stratification joints. Throughout its area of occurrence it is overlying the marls of the Gelinden Member and it is overlain by the clayey sediments of the Hannut Formation (from south to north, the Lincint Member, the Waterschei Member and the Beselare Member). Only in the utmost south-eastern part of the Campine Basin the Maaseik Member is overlain by clayey fine sands of the Late Eocene/Early Oligocene Sint-Huibrechts-Hern Formation. The contact with the underlying marls of the Gelinden Member consists of a burrowed hardground which seems to be regionally recognisable (Alken-Sint-Joriskapel borehole, Waterschei-KS22 borehole, Mol-SCK borehole). The contact with the overlying Hannut Formation may be a similar bioturbated hardground, as in the Alken-Sint-Joriskapel borehole (092W0382 – Gulinck, 1974), with glauconitic sediment filling the burrows or may be a sharp junction, as in the Waterschei-KS22 borehole (063E0222 – Steurbaut, 1998), depending on the position of the observation within the basin.

Before the Maaseik Member was formalised in 1998 by Steurbaut as the lowermost deposit of the Hannut Formation, it was informally known as the calcareous base of the Waterschei clay, calcareous Waterschei (Dusar et al., 1986) or the calcareous Landen clay (Laga & Vandormael, 1990). Before and even simultaneously with the use of the latter names in the archives of the Geological Survey of Belgium the same deposits were also informally referred to as “Gelinden b”, being the more clayey upper part of the Gelinden Member, consisting of alternating thin layers (30cm to 50cm) of pale grey clayey marl and hardened white marl. In fact geophysical well-log correlations connecting the type-sections of the Maaseik Member (the Waterschei-KS22 borehole) and the Gelinden Member (the Overbroek quarry) show both members to be, at least partially, lateral equivalents, respectively representing the more clayey and the more calcareous sediments of the same deposit. Thus it seems justified to reclassify the Maaseik Member to the Heers Formation, in agreement with its original content, as a lateral equivalent of the more clayey upper part of the Gelinden Member in its type area.

**Stratotype:** the stratotype has been defined by Steurbaut (1998) in the reconnaissance boreholes drilled in 1984 for a new shaft at the Waterschei Colliery in the eastern part of the Campine Basin. The reference borehole is known as the KS22 borehole of the Campine Collieries or the 063E0222 borehole in the archives of the Geological Survey of Belgium (coordinates: x = 238856, y = 191202, z = + 88m TAW ). The lower boundary is situated at 272m depth and is characterised by a burrowed hardground (“interburrowed junction” sensu Steurbaut, 1998) in the top of the underlying marls of the Gelinden Member. The upper boundary is situated at 263.3m depth where there’s a sharp contact with the overlying clays of the Waterschei Member of the Hannut Formation. Steurbaut (1998) conducted biostratigraphical research on samples of the cored Palaeocene interval. Based on his results the Maaseik Member is attributed to nannofossil zone NP6.

**Area:** the north-eastern part of Belgium, more specifically the provinces of Limburg and Antwerp and the eastern part of the province of Brabant. The Maaseik Member covers the Rur Valley Graben, the Campine Basin and the north-eastern part of the Brabant Massif. In whole of the area it remains in subcrop. Depending on the boundary between the Maaseik Member and its lateral equivalent the upper part the Gelinden Member (“Gelinden b”), which unfortunately will be rather arbitrary to define, the Maaseik Member might outcrop in a narrow (less than 2km wide) SW-NE trending strip going from Hannut to Bilzen.

**Thickness:** maximum about 9m in the Molenbeersel borehole (049W0226) in the Rur Valley Graben in the northeast of Belgium. In the type-section in Waterschei in the east of the Campine Basin the Maaseik Member has a thickness of approximately 8.5m. In most of the boreholes in the area of the Campine Collieries it is about 7m thick. From there on its thickness decreases to the west and to the north.

**Age:** Late Selandian.

**Remarks:** a boundary still has to be defined between the Maaseik Member and its lateral equivalent the upper part of the Gelinden Member, informally referred to as “Gelinden b” in the archives of the Geological Survey of Belgium.

The member is also discussed by Steurbaut (1998), De Geyter, Welkenhuysen & De Ceukelaire (2010) and Steurbaut (2015). As it is a lateral equivalent of the Gelinden Member Dumont (1850, 1852), Thielens (1871), Vincent (1873), De Saporta & Marion (1873, 1877), Gosselet (1874), Rutot & Van den Broeck (1884), Leriche (1903), Gulinck & Hacquaert (1954), Gullentops (1963), Gulinck (1965), Herman (1973), Schumacker-Lambry (1973, 1978), De Geyter (1981), Moorkens (1973, 1982), Dreesen et al. (1999), Hooyberghs et al. (1999) and Dreesen (2010) can also be consulted.

**Geophysical borehole references:** reference boreholes with geophysical log pattern of the Maaseik Member between the Gelinden Member and the Hannut Formation in the Rur Valley Graben and the Campine Basin are the Molenbeersel borehole (049W0226), the Waterschei-KS22 borehole (063E0222), the Opglabbeek-KS19 borehole (063W0215), the Genk-Blue Bell borehole (078W0362), the Alken-Sint-Joriskapel borehole (092W0382), the Mol-SCK borehole (031W0237), the Herentals borehole (030W0372), the Heibaart borehole (007E0178) and the Brasschaat borehole (015E0267).

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