

Bolderberg Formation

Unit name: Bolderberg Formation

Hierarchical unit name: /

Type: Formation

Code: Bb

Author(s):

- Compiled by: Deckers Jef & Louwye Stephen

Alternative names: /

Origin of the name: The origin of the unit name is discussed in De Meuter & Laga (1976).

Status: Formal

Date: 01/05/2022

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Characterizing description

The lithology of the Bolderberg Formation consists in the eastern part of northern Belgium at the base of dark green, often clayey, medium fine-grained sandy unit, micaceous, slightly ligniferous and glauconitic (i.e. the Houhalen Member), grading into fine-grained to fairly coarse-grained sand with lignite and gravel layers (i.e. the Genk Member) (Louwye et al. 2020). The boundary between both facies is not sharp but gradual. The basal gravel layer (the Elsloo gravel) consists of rounded pebbles and shark teeth. A third lithofacies is encountered in the very eastern part of the Limburg Province, namely a medium-grained, white sandy unit holding a lignite seam (the Kikbeek lignite) and a quartzite layer, called the Opgrimbe Facies) (Gullentops, 1963, 1972-1973; Matthijs, 1999). The isolated Heizel Facies occurs west of Brussels and consists of yellow-brown, micaceous, fine-grained sand with thin clay layers (Gulinck, 1956, 1959)

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

The type locality is the village of Bolderberg, about 10 km north of Hasselt (Limburg province). The type sections of the formation are the now disappeared outcrops (road cuttings) on the Bolderberg hill.

The Gruitrode borehole (DOV kb18d48w-B186; GSB 048W0185) is a type geophysical borehole with the Bolderberg Formation between 92 m and 178 m depth on top of the Voort Formation and below the Diest Formation, according to Louwye et al. (2020).

Description upper boundary

The Bolderberg Formation is covered unconformably by the basal gravel of the Diest Formation, the Molenbeersel Formation near the Roer Valley graben or Quaternary deposits.

Description lower boundary

The Bolderberg Formation rests unconformably on the upper Oligocene deposits.

Thickness

The thickness generally increases in northeastern direction across the Campine area and reaches around 80 m just to the west or in the footwall of the border fault system of the Roer Valley Graben (Deckers et al., 2019). The thickness further increases into the Roer Valley Graben where it reaches its maximum of 155 m in the Molenbeersel borehole (DOV kb18d49w-B225; GSB 049W0225; Figure 0-2).

Occurrence

The Bolderberg Formation occurs in the eastern part of northern Belgium, in exposures in the hills around and to the south of Diest (Brabant province), and in the top of the hills west of Brussels (see Figure 0-1).

Regional correlations

The Bolderberg Formation can largely be correlated with the Berchem Formation which occurs in the eastern part of northern Belgium.

Age

The Bolderberg Formation has a confirmed late Burdigalian to early Serravallian age through dinoflagellate cyst analysis (Deckers & Louwye, 2017).

Dataset

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

Name	GSB name	DOV name	GSB Collections URL	DOV URL
Molenbeersel borehole	049W0225	kb18d49w-B225	http://collections.naturalsciences.be/ssh-geology-archives/arch/049w/049w0225.txt	https://www.dov.vlaanderen.be/data/boring/1985-082429
Gruitrode borehole	048W0185	kb18d48w-B186	http://collections.naturalsciences.be/ssh-geology-archives/arch/048w/048w0185.txt	https://www.dov.vlaanderen.be/data/boring/1984-024471

References

Deckers, J., De Koninck, R., Bos, S., Broothaers, M., Dirix, K., Hamsch, L., Lagrou, D., Lanckacker, T., Matthijs, J., Rombaut, B., Van Baelen, K. & Van Haren, T., 2019. Geologisch (G3Dv3) en hydrogeologisch (H3D) 3D-lagenmodel van Vlaanderen. Studie uitgevoerd in opdracht van het Vlaams Planbureau voor Omgeving, departement Omgeving en de Vlaamse Milieumaatschappij. VITO, Mol, VITO-rapport 2018/RMA/R/1569. <https://archieff-algemeen.omgeving.vlaanderen.be/xmlui/handle/acd/251494>

Deckers, J. & Louwye, S., 2017. A reinterpretation of the ages and depositional environments of the lower and middle Miocene stratigraphic records in a key area along the southern margin of the North Sea Basin. *Geological Magazine*, 156, 525–532. <https://doi.org/10.1017/s0016756817000991>

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.

Gulinck, M., 1956. Note sur la formation des 'Sables Chamois' (Néogène) de la région du Heysel. *Bulletin de la Société belge de Géologie, de Paléontologie et d'Hydrologie*, 65, 227–229.

Gulinck, M., 1959. Sur l'extension, en Campine, des "Sables Chamois" du Heysel. Bulletin de la Société belge de Géologie, 68, 371-372.

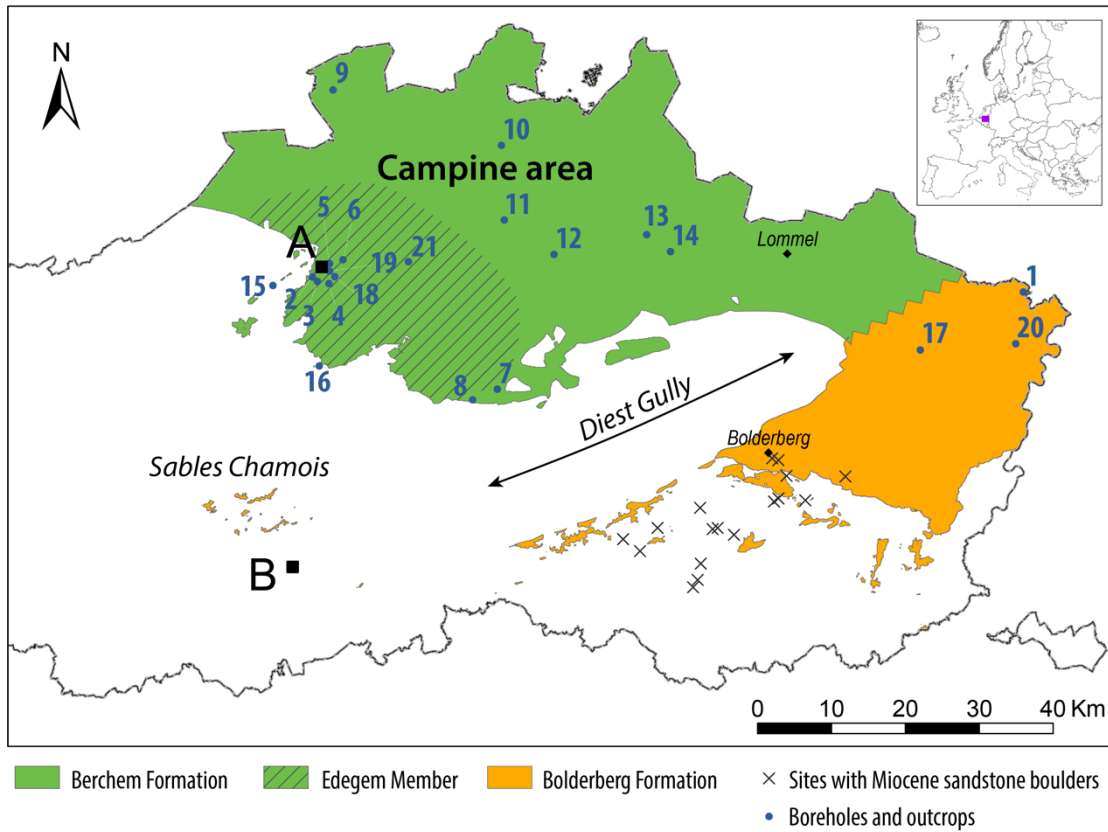
Gullentops, F., 1963. Etude de divers faciès quaternaires et tertiaires dans le Nord et l'Est de la Belgique. 6e Congrès International de Sédimentologie, Belgique et Pays-Bas, 20 p.

Gullentops, F., 1972-1973. Grainsize and mineralogy of Miocene glass- sands of Maasmechelen, Belgian Limburg. Mededelingen Rijks Geologische Dienst, 23, 25–34.

Louwye, S., Deckers, J., Verhaegen, J., Adriaens, R. & Vandenberghe N., 2020. A review of the lower and middle Miocene of northern Belgium. *Geologica Belgica*, 23/3-4, 137-156. <https://doi.org/10.20341/gb.2020.010>

Matthijs J., 1999. Toelichtingen bij de geologische kaart van België, Vlaams Gewest: kaartblad 25, Hasselt [1/50 000]. Belgische Geologische Dienst en Ministerie van de Vlaamse Gemeenschap, Afdeling Natuurlijke Rijkdommen en Energie, Brussel, 104 p.

Annexes



Name	Code BGD	Code DOV	Nr
Molenbeersel	049W0225	kb18d49w-B225	1
Antwerp - Montignystraat	028W0394	kb15d28w-B448	2
Antwerp - Van Rijwijcklaan	028W0395	kb15d28w-B449	3
Berchem - Grote Steenweg	028W0397	kb15d28w-B451	4
Antwerp - Kievitstraat outcrop	028W0399	kb15d28w-B453	5
Borgerhout - Rivierenhof	028E0499	kb15d28e-B580	6
Zonderschoot		TO-19720101	7
Heist-op-den-Berg		kb24d59e-B180	8
Kalmthout	006E0110	kb7d6e-B239	9
Rijkevorsel	016E0153	kb8d16e-B36	10

Name	Code BGD	Code DOV	Nr
Oostmalle	029E0249	kb16d29e-B276	11
Poederlee	030W0300	kb16d30w-B315	12
Retie	031W0243	kb17d31w-B228	13
Mol	031W0221	kb17d31w-B212	14
Burcht outcrop		TO-20050101A	15
Terhagen outcrop		TO-20050101B	16
Wijshagen	048W0180	kb18d48w-B181	17
Berchem		TO-20150701	18
Antwerp		TO-20190417	19
Maaseik	049W0220	kb18d49w-B220	20
Oelegem	029W0378	kb16d29w-B401	21

Figure 0-1: Geographical distribution of the Berchem Formation in northern Belgium with locations of research boreholes and outcrops (Louwye et al., 2020).

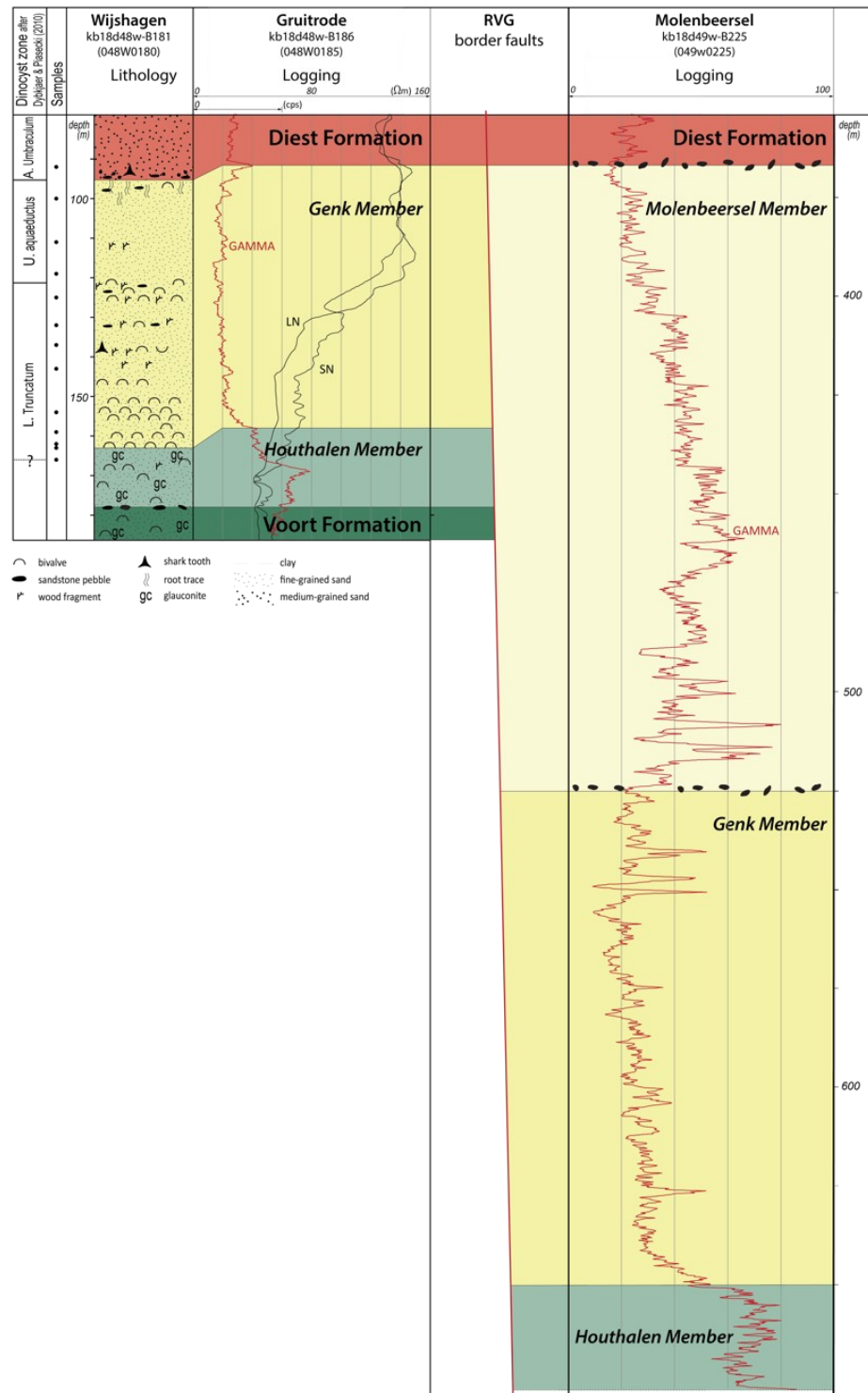


Figure 0-2: The Bolderberg Formation in the Wijshagen, Gruitrode and Molenbeersel wells. See Louwye et al. (2020) for further information.