

Donk Member (Mol Formation)

Unit name: Donk Member

Hierarchical unit name: Mol Formation

Type: Member

Code: MlDo

Author(s):

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Alternative names: -

Origin of the name: -

Status: Formal

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Characterizing description

The Maat lignite Bed subdivides the Mol Formation into a Donk Member below the lignite and a Maatheide Member above the bed.

Both sand units are pale grey to white quartz sand with an exceptionally high quartz content. The Donk Sand Member is finer grained than the Maatheide Sand Member; the latter has a modal size generally above 250 μm (Gullentops & Vandenberghe, 1995). However the Donk Sand Member close to the Mol Rauw Fault in the Witgoor-Dessel area also has a median grain size well above 250 μm , whilst further west in the Retie-Geel-Kasterlee area its median size is smaller than 200 μm (Vandenberghe et al., 2020). In the Poppel-Rauw fault zone and eastwards of it the Donk Sand Member contains a substantial 250-355 μm size fraction. Compared to the underlying Retie Member, the Donk Member is characterized by a fraction > 250 μm ; in addition during drilling the borehole mud starts to take an olive-green hue at the top of the Retie Member. Some rare thin clay laminae are reported in boreholes, as are some quartz and quartzite gravels at the base (Gullentops and Vandenberghe, 1995). No macrofossils are present.

Type section, type locality, type borehole, or type geophysical borehole

The area west of the Poppel-Rauw Fault as figured in a series of boreholes in Vandenberghe et al. (2020, fig. 2) is a reference area for the Donk Member. In particular the boreholes in the Dessel area are considered as reference: ON-Dessel-2 (031W0338/kb17d31w-B299), ON-Dessel-3 (031W0354) & ON-Dessel-4 (031W0353/0376). These boreholes by ONDRAF-NIRAS have cores, sediment and mineral analyses, CPT logs and resistivity and gamma-ray logs (references in Vandenberghe et al., 2020 and Schiltz, 2020). In the area of the Poppel-Rauw Fault zone and eastward of it, the Donk Member is observed only in the subsurface below the Maat lignite Bed as figured in the boreholes in fig. 5 in Vandenberghe et al. (2020).

Description upper boundary:

In the Antwerp province type area, diverse pale coloured quartz-enriched sand Quaternary deposits occur above the Donk Member; they have higher chroma colours compared to the Donk Member and are admixed with loam or organics; also base gravel may be present. The base of the Quaternary varies between 2,5 and 5 m depth. In the Poppel-Rauw Fault zone the Donk Member occurs below the Maat Lignite Bed.

Description lower boundary

In the Kasterlee-Mol-Dessel area west of the Poppel-Rauw Fault zone, the contact with underlying Retie Member in the reference boreholes occurs at 8 m depth in ON-Dessel-2, at 13,6 m in ON-Dessel-3 and at 14 m depth in ON-Dessel-4. The Donk Sand Member is differentiated from the Retie Member by the presence of a > 250 µm fraction in the former. In the area east of the Rauw Fault a clay bed (the informal level 3 clay bed) is present below the Donk Member and above the Retie Member as observed in the boreholes Stevensvennen MHL 03/01 (032W0460; GEO-03/071-B2) and SCK3/Postel 2 (032W/0415; kb17d32w-B385). Gravel can occur in the basal part of the Donk Member.

Thickness

In the Kasterlee-Mol-Dessel area west of the Poppel-Rauw Fault zone, the thickness of the Donk Member is between 5 and 10 m. The Donk (SIB-DON-02-03) and Pinken (SIB-PIN-03-03) sand pits closer to the Poppel- Rauw Fault zone show a marked increase in the Donk Member thickness up to 24 m. From this fault zone eastwards the Donk Member is about 25 m thick.

Occurrence

The Maat lignite Bed, subdividing the Donk Member below from the Maatheide Member above, is outcropping along the Campine Canal in the Poppel-Rauw Fault zone west of Rauw 1 Fault (Geological map 17 Mol, Gullentops & Vandenberghe (1995)). The faults are normal faults bordering the extent of the lignite and down dropping it at their eastern side. Therefore the Donk Member occurs near surface directly underlying the Quaternary only west of the Rauw 1 Fault. In the subsurface to the north in the Antwerp province the Mol Formation the distinction with the Brasschaat Formation is not obvious (Laga, 1976 –profile PGL76/106/3) and geometrically the formation seems to transition into the relatively coarse Merksplas Formation (Laga, 1976 – profiles 76/106/2 and 75/104/1) [see also Lithostratigraphic Identification sheets of the Merksplas Formation (Note: in the Neogene Volume Louwye et al. (2020) and Vandenberghe and Louwye (2020) have named the Pliocene quartz sand in the west the Merksplas Formation and not Brasschaat Member as this name is reserved in the NCS for Pleistocene fine-sized sand.).

East of the Rauw -1 Fault the Donk Member occurs in the subsurface below the Maatheide Member and Maat Lignite Bed. On the geological maps, the Mol Formation, including the Donk Member, is conventionally limited in the east by the major Roer Valley Graben (RVG) western boundary fault of Reppel to the east of which occurs the quartz sand of the Kieseloolite Formation.

Regional correlations

In the absence of solid biostratigraphic data , geometrical considerations alone allow to suggest a possible correlation with part of the Kieseloolite Formation in the RVG, the Rees Facies and the Merksplas Formation in the west (Louwye & Vandenberghe, 2020, fig. 3.

Gullentops and Vandenberghe (1995) have reported at the base of the Donk Member, the occurrence of a quartz gravel of the same type as the Hukkelberg gravel bed at the base of the Poederlee Member.

Age

See LIS file Mol Formation for information on the age of this member.

Dataset

Data in the 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
MHL 03/01 Stevensvennen	032W0460	GEO-03/071-B2	https://collections.naturalsciences.be/ssh-geology-archives/arch/032w/032w0460.txt	https://www.dov.vlaanderen.be/data/boring/2016-133443
SCK 13/Postel 2 borehole	032W0415	kb17d32w-B385	https://collections.naturalsciences.be/ssh-geology-archives/arch/032w/032w0415.txt	https://www.dov.vlaanderen.be/data/boring/1982-022507
ON-Dessel-2	031W0338	kb17d31w-B299	https://collections.naturalsciences.be/ssh-geology-archives/arch/031w/031w0338.txt	https://www.dov.vlaanderen.be/data/boring/2002-096456
ON-Dessel-3	031W0354	ON-Dessel-3	https://collections.naturalsciences.be/ssh-geology-archives/arch/031w/031w0354.txt	https://www.dov.vlaanderen.be/data/boring/2008-162468
ON-Dessel-4	031W0353/0376	ON-Dessel-4	https://collections.naturalsciences.be/ssh-geology-archives/arch/031w/031w0376.txt and 0376.txt	https://www.dov.vlaanderen.be/data/boring/2008-160128
Donk pit-borehole		SIB-DON-02-03	-	https://www.dov.vlaanderen.be/data/boring/2019-162348
Pink pit-borehole		SIB-PIN-03-03	-	https://www.dov.vlaanderen.be/data/boring/2019-162349

References

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