

## Zandvliet Member (Lillo Formation)

**Unit name:** Zandvliet Member

**Hierarchical unit name:** Lillo Formation

**Type:** Member

**Code:** LiZa

**Author(s):**

- Compiled by: Deckers Jef & Louwye Stephen
- Modification of: De Meuter & Laga (1976)

**Alternative names:** /

**Origin of the name:** Zandvliet, district near the border with the Netherlands, north of Antwerpen

**Status:** Formal

**Date:** 01/05/2022

**How to refer:** Deckers, J., & Louwye, S., 2023. The Zandvliet Member, 01/09/2023. National Commission for Stratigraphy Belgium. <http://ncs.naturalsciences.be/lithostratigraphy/Zandvliet-Member>

### Characterizing description

The Zandvliet Member, introduced as a new member by De Meuter & Laga (1976), is as a fine-grained, glauconiferous and slightly clayey quartz sand. It is horizontally stratified and contains sandstones and siderite concretions. Characteristically and contrary to the other members of the Lillo Formation, it is decalcified and holds no shells or shell debris.

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

The type locality is the village Zandvliet, located north of Antwerp. The type section was in a temporary outcrop for the construction of the Zandvlietsluis north of the city of Antwerp (GSB 014E0153, 014E0154, 014E0155, 014E0156; DOV [GEO-79/205-A](#), [GEO-79/205-B](#), [GEO-79/205-C](#), [GEO-79/205-D](#); Figure 0-1). These were correlated with CPTs by Deckers et al. (2021; [GEO-79/202-SIII](#); [GEO-83/033-SXXXV](#); [GEO-79/202-SVI](#); [GEO-79/202-SVIII](#); see also Figure 0-2).

Type geophysical borehole log is borehole Stabroek (GSB: 015W0216; DOV [kb7d15w-B296](#)) with the Zandvliet Member from 4 to 10 m depth (Figure 0-3).

### Description upper boundary

In its western and southern areal, it is overlain by Quaternary strata. Further east and north, as it deepens, it is overlain by the Malle Formation. The contact with the Malle Formation is characterized by the upwards decrease in glauconite, coarsening of the grain-size and discoloration (grey-green to grey). On Cone Penetration Tests, the boundary with the Malle Formation is not obvious, and on geophysical borehole logs it is expressed by an upwards decrease in gamma-ray values and increase in resistivity values (Figure 0-3).

### Description lower boundary

It overlies the Merksem Member of the same formation. This boundary is characterized by the upwards disappearance in carbonate. On Cone Penetration Tests, in case the Merksem Member is

carbonate-rich, the boundary coincides with a sharp upwards decrease in cone resistance (Deckers et al., 2021; Figure 0-2). On geophysical borehole logs, the boundary with the Merkssem Member is not obvious on the gamma-ray log (Figure 0-3).

### Thickness

Up to 15 m. Near the type section, a decrease in thickness results in an increased thickness of the underlying Merkssem Member (Deckers et al., 2021).

### Occurrence

Probably restricted to the northern part of the Port of Antwerp and nearby the villages of Zandvliet, Berendrecht and Stabroek.

### Regional correlations

It probably correlates with the lower part of the Maassluis Formation in the Netherlands.

### Age

No age information is available.

### 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
Outcrops Zandvliet Sluice	014E0153, 014E0154, 014E0155, 014E0156	<a href="#">GEO-79/205-A</a> , <a href="#">GEO-79/205-B</a> , <a href="#">GEO-79/205-C</a> , <a href="#">GEO-79/205-D</a>	<a href="https://collections.naturalsciences.be/ssh-geology-archives/arch/014e/014e0153.txt">https://collections.naturalsciences.be/ssh-geology-archives/arch/014e/014e0153.txt</a> , ...154.txt, ..155.txt and ...156.txt	<a href="https://www.dov.vlaanderen.be/data/boring/1979-027043">https://www.dov.vlaanderen.be/data/boring/1979-027043</a> , , ...044, ...045, ...046

Extra data, compared to the [DOV-Neogene data collection, including links to the GSB-collection data sheets](#):

Name	GSB name	DOV name	GSB Collections URL	DOV URL
Outcrops Zandvliet Sluice	014E0153, 014E0154, 014E0155, 014E0156	<a href="#">GEO-79/205-A</a> , <a href="#">GEO-79/205-B</a> , <a href="#">GEO-79/205-C</a> , <a href="#">GEO-79/205-D</a>	<a href="https://collections.naturalsciences.be/ssh-geology-archives/arch/014e/014e0153.txt">https://collections.naturalsciences.be/ssh-geology-archives/arch/014e/014e0153.txt</a> , ...154.txt, ..155.txt and ...156.txt	<a href="https://www.dov.vlaanderen.be/data/boring/1979-027043">https://www.dov.vlaanderen.be/data/boring/1979-027043</a> , , ...044, ...045, ...046
Cone Penetration Tests Zandvliet Sluice		<a href="#">GEO-79/202-SIII</a> ; <a href="#">GEO-83/033-SXXXV</a> ; <a href="#">GEO-79/202-SVI</a> ; <a href="#">GEO-79/202-SVIII</a>		<a href="https://www.dov.vlaanderen.be/data/sondering/1979-007441">https://www.dov.vlaanderen.be/data/sondering/1979-007441</a> , <a href="https://www.dov.vlaanderen.be/data/sondering/1983-062172">https://www.dov.vlaanderen.be/data/sondering/1983-062172</a> , <a href="https://www.dov.vlaanderen.be/data/sondering/1979-007468">https://www.dov.vlaanderen.be/data/sondering/1979-007468</a> , <a href="https://www.dov.vlaanderen.be/data/sondering/1979-007468">https://www.dov.vlaanderen.be/data/sondering/1979-007468</a>

				<a href="https://www.dov.vlaanderen.be/data/sondering/1979-007492">laanderen.be/data/sondering/1979-007492</a>
Borehole Stabroek	015W0216	<a href="https://collections.naturalsciences.be/ssh-geology-archives/arch/015w/015w0216.txt">kb7d15w-B296</a>	<a href="https://collections.naturalsciences.be/ssh-geology-archives/arch/015w/015w0216.txt">https://collections.naturalsciences.be/ssh-geology-archives/arch/015w/015w0216.txt</a>	<a href="https://www.dov.vlaanderen.be/data/boring/2016-147541">https://www.dov.vlaanderen.be/data/boring/2016-147541</a>

## References

Deckers, J., Verhaegen, J., Vergauwen, I., 2021. Characterization by Cone Penetration Tests of the decalcified Zandvliet Sand (Lillo Formation, North Belgium). *Geologica Belgica*, 24/3-4, 159-167. <https://doi.org/10.20341/gb.2021.006>

De Meuter, F. & Laga, P. 1976. Lithostratigraphy and biostratigraphy based on benthonic Foraminifera of the Neogene deposits of northern Belgium. *Bulletin van de Belgische Vereniging voor Geologie*, 85/3-4, 133–152.

Laga, P., 1979. Borehole description Stabroek, GSB 015W0216. <http://collections.naturalsciences.be/ssh-geology-archives/arch/015w/015w0216.txt>, accessed 01/12/2021.

Laga, P., 1980. Boringen Tweede Zandvlietsluis. Archives Geological Survey of Belgium. <https://collections.naturalsciences.be/ssh-geology-archives/profiles-boreholes/Varia%20profiles%20boreholes/pgl/neogeen/pgl-80-217.jpg/view>

Louwye, S., Deckers, J. & Vandenberghe, N., 2020. The Pliocene Lillo, Poederlee, Merksplas, Mol and Kieseloolite Formations in northern Belgium: a synthesis. *Geologica Belgica*, 23/3-4, 297-313. <https://doi.org/10.20341/gb.2020.016>

Annexes

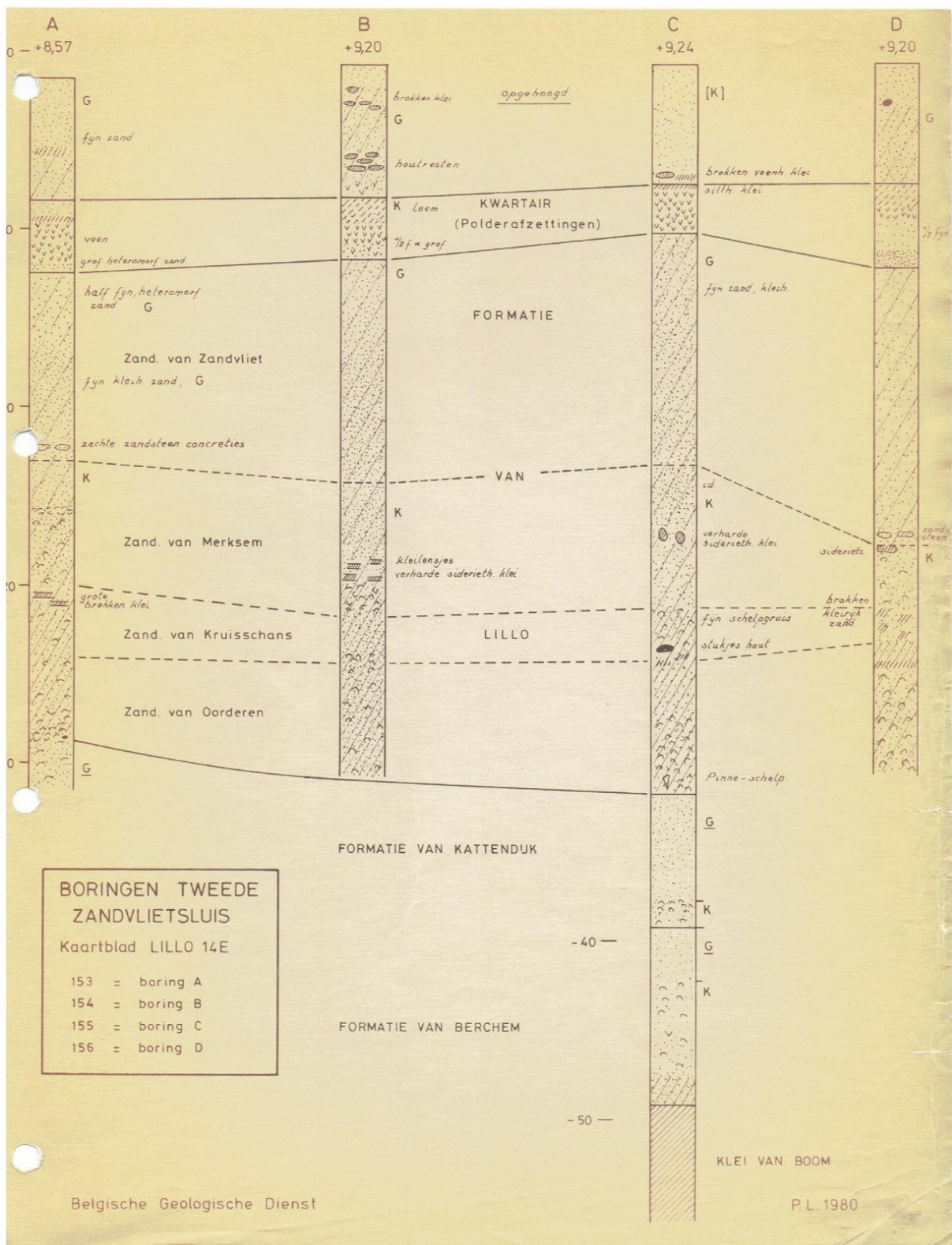


Figure 0-1: The Zandvliet Member as identified in boreholes at the Zandvlietluis by Laga (1980).

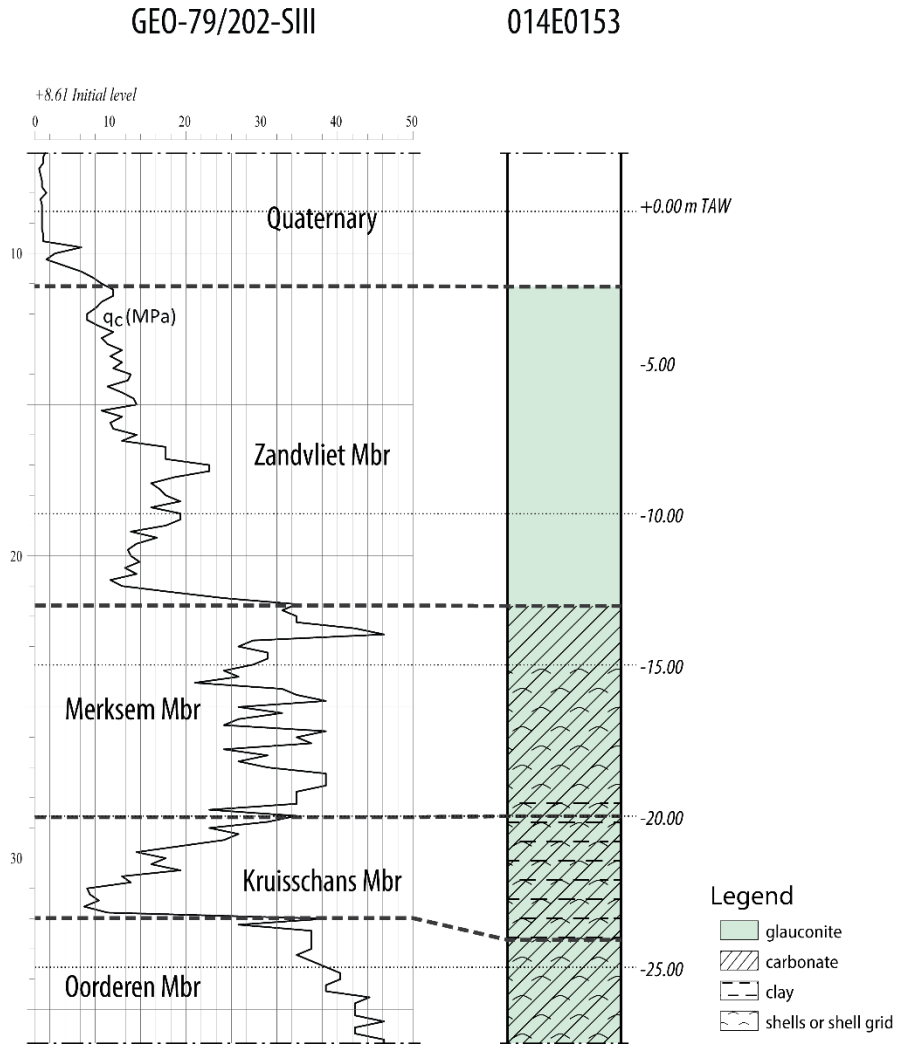


Figure 0-2: The typical CPT expression of the Zandvliet Member at the Zandvlietluis after Deckers et al. (2021).

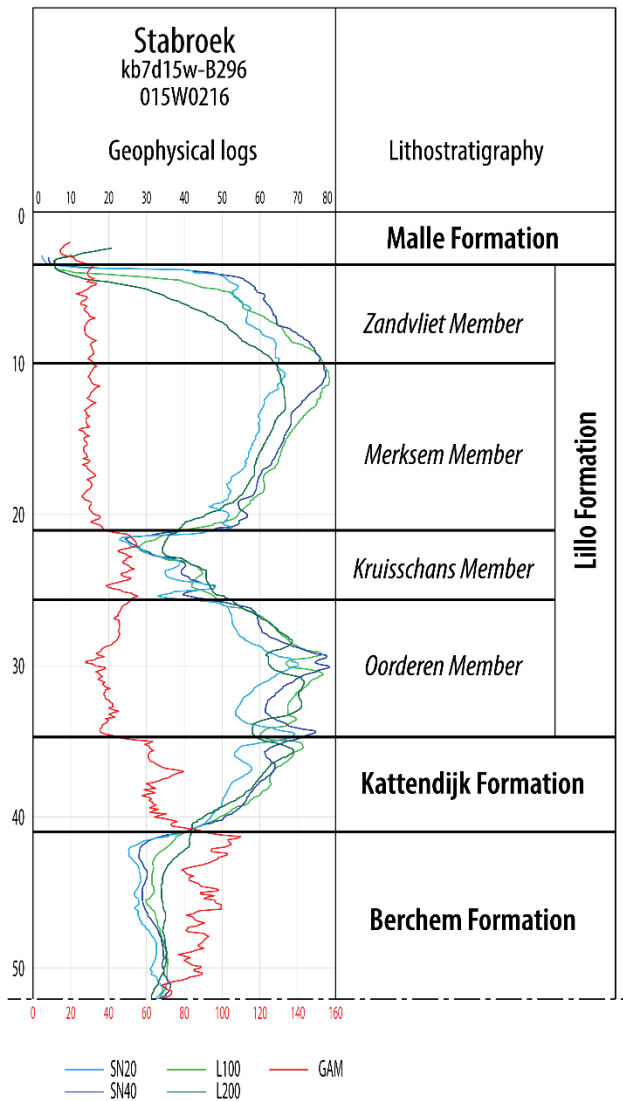


Figure 0-3: Log-expression of the Zandvliet Member in borehole Stabroek, modified after Laga (1979). The latter author located the lower boundary of the Zandvliet Member at 14 m depth. However, between 10 and 14 m, the presence of carbonate is mentioned which is why this interval is now re-interpreted as belonging to the Merksem Member.