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Lower Miocene (Upper Ottnangian) sands in the Lower Austrian Molasse Basin

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In the Early Miocene (late Ottnangian), a global sea level drop and the continuous rise of the Alps lead to the regression of the Parathethys sea, and to the sedimentation of the Upper Freshwater Molasse. In the Lower Austrian Molasse Basin, this event is represented by yellowish-brownish to greyish white mica-rich and carbonate-free sands and silts with clayish interlayers, formerly called Oncophora Beds (OB), which crop out between St. Pölten and Tulln. A new lithostratigraphy combines these sediments, now called Traisen-Formation (TF) together with the Dietersdorf Formation within the Pixendorf Group.
Drill cores from OMV-wells predominantly from the NE show hundreds of meters thick sequences of pelites with intersections of sands interpreted as representing the OB. Contrary to the mainly brackish TF, a turbiditic marine deeper-water environment is inferred.
An OMV-funded project investigates the relationship between these sediments, their stratigraphical and chronological range, provenance, facies and internal stratigraphy.
First results from outcrops and several wells in the NE confirm large differences in grain size, structures and carbonate content. XRD-results indicate quartz, feldspar, muscovite, chlorite, calcite and dolomite as the main minerals within the sands and pelites. Pyrite is frequent. Halite and kaolinite occur.
Whole rock chemistry, carbonate content measurements and biostratigraphic investigations of samples from the Wildendürnbach K4 well indicate, that these turbiditic OB can be divided into two sections: A lower fossil-free, carbonate poor and probably brackish (indicated by B/Al* and TOC/S) section with only few turbiditic very fine sands, and an upper microfossil bearing, marine section with carbonate contents up to 30% and more and coarser turbiditic sands. Therefore we use the working terms Lower and Upper Wildendürnbach Member (LWM, UWM).
The lower part is enriched in (redox sensitive) heavy minerals such as Ce, Co, Cr, Cu, Gd, Ni, Pb, Sc, Zn and REE. It shows much lower constant Sr (about 140 ppm) values and B/Al* ratios (about 80) than the upper part (150 - 250 ppm; >120). The TOC/S ratio is much higher (17-23) in the LWM than in the UWM (>5). These two members can be correlated quite well by SP-logs over several wells.
Therefore it can be concluded, that the lower part represents a period of salinity and carbonate crisis which may correspond to an (more or less) isolated deep basin probably poor in oxygen. At the beginning of the upper interval, a connection with the open sea was reestablished.