Fan delta conglomerates from the western margin of the southern Vienna Basin (Lindabrunn Conglomerate Formation, Upper Badenian, Miocene, Austria)

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During the Badenian stage of the Miocene, the Vienna basin formed a part of the western Paratethys Sea. Basin development was tectonically controlled by a pull-apart regime between the Eastern Alps and the Western Carpathians. At the western basin margin, to the south of Vienna, two facies were deposited: a conglomerate facies and to a minor extent a Corallinacea limestone facies (Leithakalk). The different types of conglomerate facies are known as „Gainfarner Breccie", „Vöslauer (Badener) Konglomerat" and „Lindabrunner Konglomerat". The Lindabrunn Conglomerate Formation, belonging stratigraphically to the Rotalia zone (uppermost Badenian), is the only conglomerate which is still actively mined for building blocks and sculptural material in a large quarry. The conglomerates are composed predominantly of clasts derived from the Northern Calcareous Alps. This quarry allows insights in the sequences and internal organisation of this conglomerate facies.

The exposure has nearly an east (basinward) - west (landward) extent of about 200 meters. A distinct erosional surface, dipping at 4° towards the northeast, subdivides the conglomerates into two sequences. The lower sequence, of about 4 to 6 m thickness, consists mainly of massive conglomerate beds. Thin sandstone lenses occur within the conglomerates. The upper part of these lower conglomerates was deposited in erosional channels. A stacking pattern of channels can be observed. Thin reddish pelitic layers between low-angle bedded channel-fill conglomerates are indicative of inactive channel periods. The major erosional surface truncates the channel-fill deposits. The conglomerates above this surface were also mainly deposited in channels. Towards the east, in an old quarry, now out of operation, a coarsening-up sequence of sandstones to massive conglomerate beds, instead of these channel-fill conglomerates, occurs above such a distinct erosional surface. The sandstones and massive conglomerates of the Lindabrunn Conglomerate Formation are interpreted as sub-aqueous fan delta sediments, whereas the channelized conglomerates seem to be indicative for the fluvial part of this gravelly delta. The massive conglomerates show no distinct preferred clast orientation. Bioturbation is frequently observed in the sandstones. Rare information about marine (echinids, forams), as well as brackish to limnic faunas (ostracods) are available. In general, in the conglomerate sequences, both below and above the erosional surface, a coarsening-upward trend due to fan delta progradation has been established.

The Lindabrunn Conglomerate Formation, with its progradational trend, can be stratigraphically correlated with the Upper Badenian deposits of the central Vienna Basin, which are interpreted as a highstand system tract of the whole Badenian Sequence. In the terminology of sequence stratigraphy, the quarry exposes two parasequences, separated by a marine flooding surface, both belonging to the Upper Badenian highstand system tract.