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Fluvial depositional response to long term (0.5 ma) tectonic and shorter term (<0.1ma) Base Level Changes: Upper Cenezoic Rhine Meuse system.

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The architecture of the offshore Middle / Late Pleistocen Rhine Meuse siliclastic wedge sequence south of 52˚20' resulted by the creation of accommodation space due to longer term (>100 ka) tectonic subsidence within the Voorne Trough. Prior to this time, during the Middle Pleistocene, the Channel was closed and RM flowed northward. The sequence was built up by low energy distal braided fluvial systems. Due to scarce accommodation space these beds were eroded by autocyclic fluvial channel switching. In addition fluvial beds were eroded by marine reworking during transgressions leading to a stack of complexly interbedded marine and fluvial fine to medium sands. During the Saalian Glacial Maximum (MIS 6), the Rhine Meuse system was diverted to the south by an ice sheet and fluvial erosion of the Channel led to lowering of base levels (<40 mbsf). This generated larger drainage gradients towards the south and leading to a large scale fluvial incision. The incision was followed by agradation and resulted in one of the largest coarse gravely sand concentrations within the North Sea. During the subsequent interglacial Eemian transgression, the enlarged opening of the Channel led to a large scale lusitanian invasion within the North Sea and increased

the biodiversity of the NS to its present level. Malacological evidence of sediments offshore within RM alluvial plain and beyond indicates terrestrial conditions prevailed in S52 during the Late Weichselian. After the Weichselian Maximum (MIS 2) a geostatistically coherent coarse channel belt complex formed, relating to high deglacial discharges and paraglacial sediment influx. Holocene transgression (MIS 1) eroded the upper parts of these channel fills and redistributed the RM sands northward across the North Sea shelf.