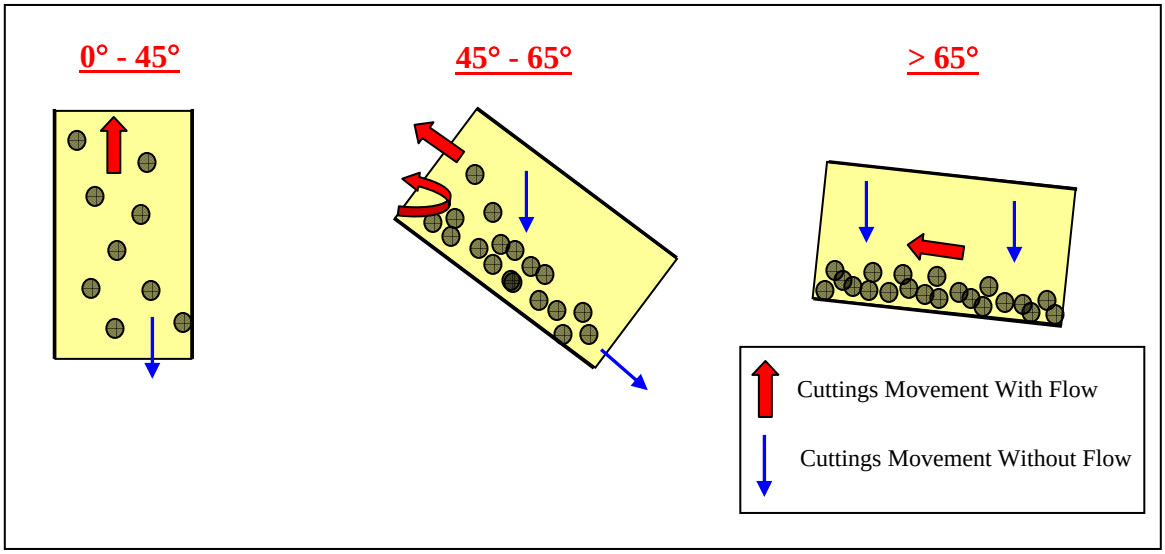
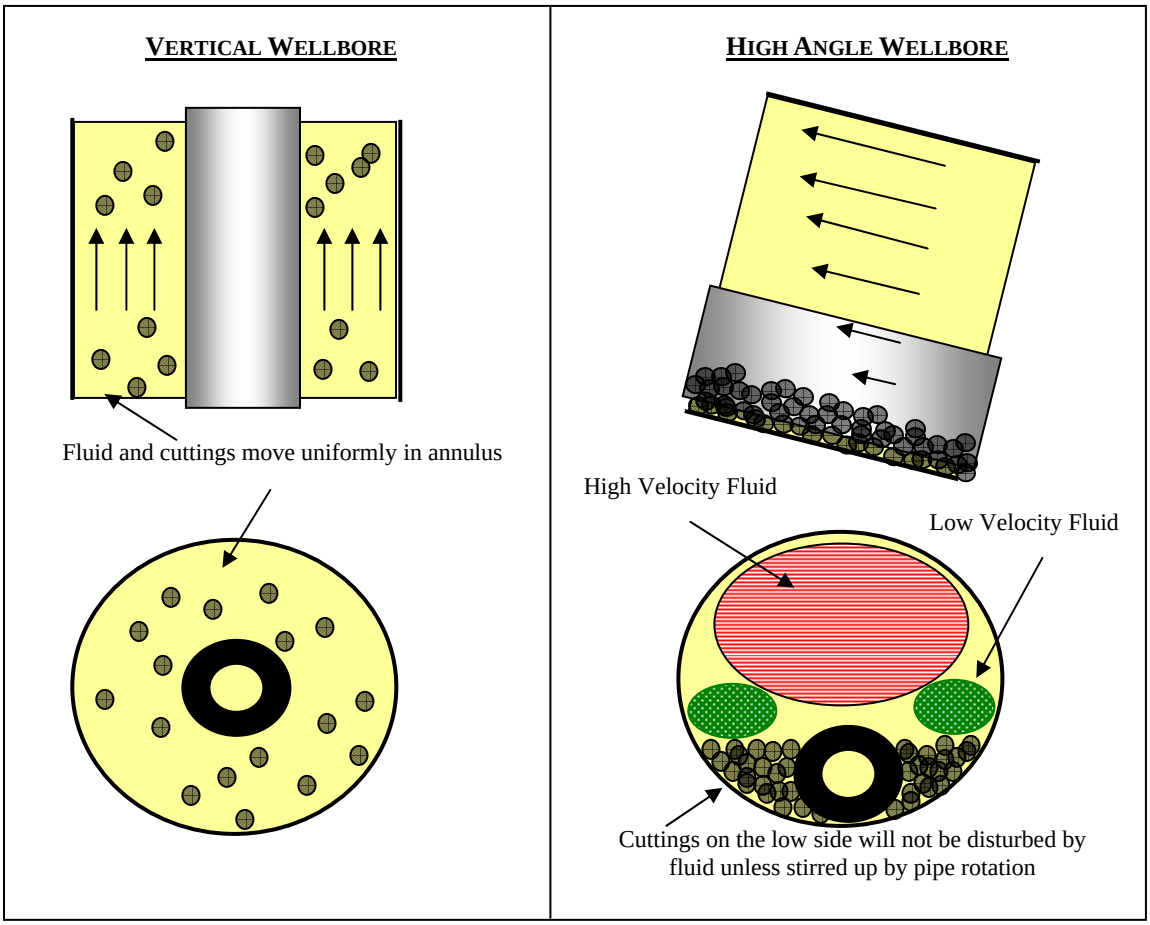
Attachment D: Hole Cleaning Issues in ERD Wells

Source: K&M Technology Group, *Drilling Design and Implementation for Extended Reach and Complex Wells – 3rd Edition*, 2003.



Cuttings Transport at Different Inclinations

Without drillpipe rotation, the fluid simply moves above the cuttings. Hole cleaning is virtually non-existent.



Fluid Movement in the Wellbore Annulus

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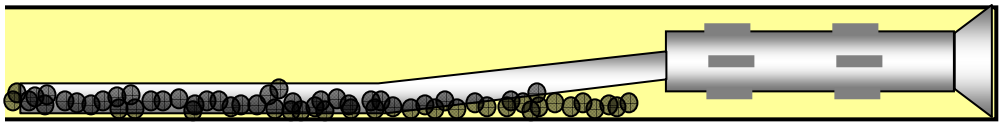
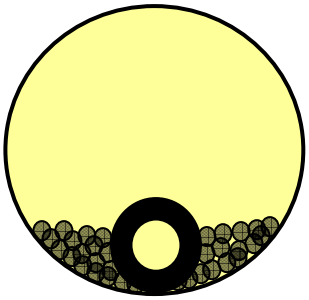
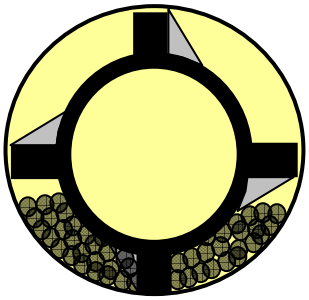


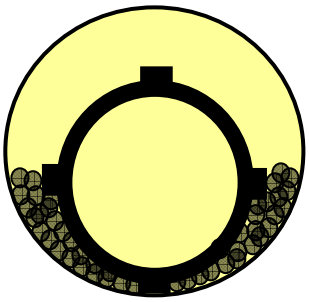
"A CLEAN HOLE FOR DRILLING IS NOT THE SAME AS A CLEAN HOLE FOR TRIPPING"



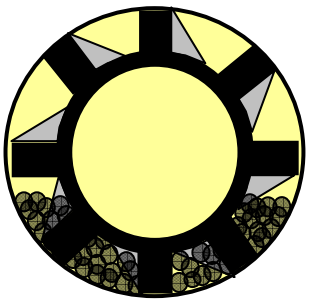
Drillpipe - Cuttings bed can be higher for drilling because the BHA is not being pulled through it



Stabilizers - can have a significant impact on how clean the hole must be to trip



Casing - Running casing will require a cleaner hole than drilling to avoid ploughing through cuttings beds



Bits - a bit with a large junk slot area will trip more freely than a heavy set bit

Clean Hole and Cuttings Beds

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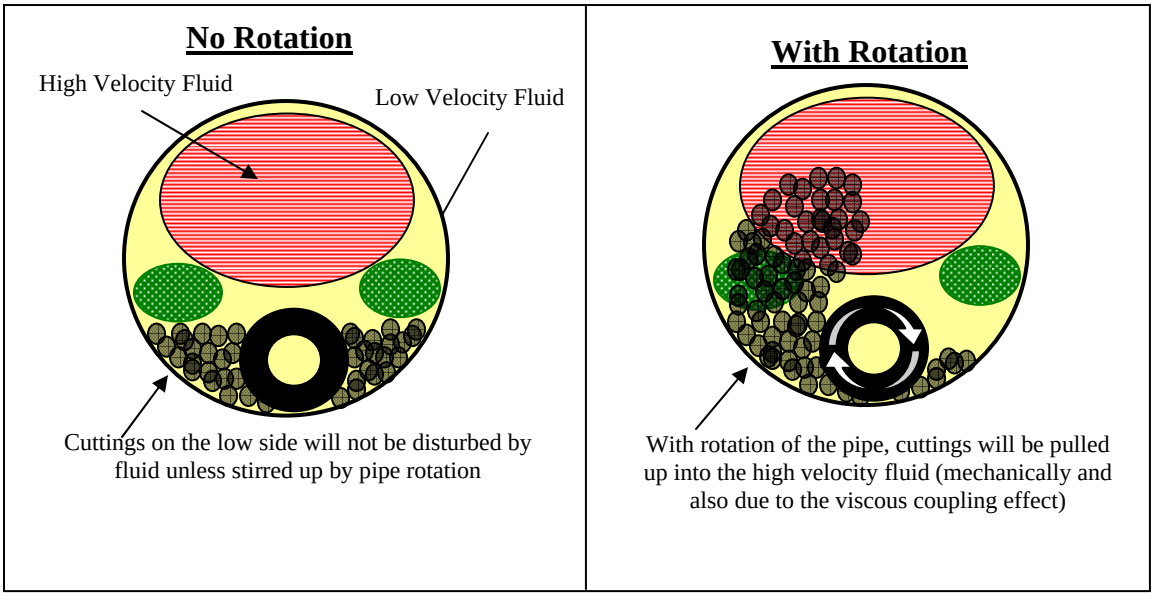

Impact of Rotation on Cuttings Beds