Graduation/ Student assistent (9 months) combination:
Gas production decline due to salt deposition (NaCl)

**Mentors**: Hans Bruining[1] (reactive flow, chemistry), Han Velthuis/Aris Twerda (TNO Oil & Gas). A collaboration project with TNO _.i.e._ part of the project will be carried out at TNO.

**Aims**: Determine:
- The source of salt in the gas reservoir
- The location, rate and field condition dependence of salt precipitation.
- How to rinse the near-well bore reservoir efficiently (frequency and amount fresh water washes), without long term damaging the reservoir
- Whether chemicals (salt-inhibitors, surfactants) can help to mitigate salt precipitation.

Motivation
Salt deposition increases towards the end of the lifetime of a gas fields and thus becomes problematic for most North Sea assets. Salt (or halite) precipitation is causing the blockage of gas flow into the in the near well bore region, fractures, the well bore itself and the downstream production facilities. The frequency and amount of water washes, which are used to temporarily dissolve and remove the salt, needs to be optimised.

Method
- Develop predictive model that quantifies the behaviour of near well bore & mitigation methods (water washes).
- Simulate a) location salt crystals and blockage, b) alteration reservoir properties by precipitation c) effect of water washes, d) the effect of surfactants (optional)

**Time schedule**:

Subject	Month-1/2	Month-3/4	Month-5/6	Month-7/8	Month-9/10
Literature	xxxx				
Model development	xx	xxxx	xx	xx	
Simulation		xx	xxxx	xxxx	
Report/ article				xx	xxxx

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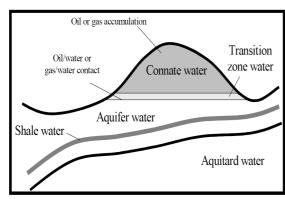
Figure 1a) Where does the salt come from ? 1b) Halite deposition (white salt) within a wellbore over Perforated Interval recorded with down-hole camera