

## **Are your formation water analyses representative?**

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Formation water analyses are an important set of data to obtain during field appraisal. Formation water samples can be obtained from wells (e.g. DST, formation testing) or core (e.g. centrifuged core) and are typically analysed in established onshore laboratories using standard methods. Once reported, they may be used by a diverse range of personnel involved in field development planning and subsequently during production. For those that use the analyses, a key question is: "Are they representative?" That is, do the in-situ formation waters have the same composition as that reported? Similarly, will formation waters at other locations (e.g. other well locations, other reservoir zones, water-leg versus hydrocarbon-leg, etc.) across the field have the same compositions?

Evaluation of the quality of the formation water analyses can provide answers to these questions although if the analyses are not representative the next question is usually "What is the representative composition likely to be?" In some cases, sufficient information is available for representative compositions to be estimated using a variety of approaches (e.g. use of analogue data, geochemical modelling, etc.).

In this presentation, field examples will be given where the quality of formation water analyses has been evaluated and formation water compositions have been estimated. It will be emphasised that an important benefit of this process is that uncertainties associated with the formation water compositions (both the original analyses and estimated values) are identified and so users of these compositions can allow for these uncertainties in their applications.