

Production and Integrity Assurance



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Is Your Reservoir Likely to Sour?

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Many H_2S -free, or sweet reservoirs, undergo microbiological souring due to the combination of water flooding and the presence of sulphate-reducing bacteria (SRB).

This can result in hundreds, or thousands, of parts per million of H_2S in gas.

How susceptible is your reservoir to souring and what can be done to mitigate the effects of this problem?





Sulphate-Reducing Bacteria

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Is Your Petroleum Reservoir Likely to Sour and to What Extent?

Whether or not your reservoir is susceptible to souring is dependent on a variety of factors. These include whether water injection is implemented, the temperature of the reservoir, the salinity of the brine and the presence of bacterial nutrients.

The likelihood of reservoir souring taking place can be evaluated by means of a souring risk assessment. These can be performed either pre or post-production and include an analysis of the conditions and recommendations from experts on the most effective ways of dealing with the problem.

Key Challenges Posed by the Presence of H₂S

The unplanned production of H₂S has serious consequences. H₂S is highly toxic and can cause rapid and catastrophic failure of susceptible construction materials.

It also devaluates the revenue stream and can necessitate high treatment costs. Some of the risks and setbacks associated with the presence of H₂S are:

Threats to Personnel Safety

Even low levels of H₂S can have a toxic effect, necessitating the need for stringent safety measures. This is especially true for high-risk activities such as oil, gas and water sampling.

Requirements for 'Sour Service' Materials

Above a certain threshold, 'sour service' materials are required to prevent failure due to specific sulphide-induced cracking mechanisms, such as sulphide stress corrosion cracking.

Jeopardising Export Requirements

Fields producing sour fluids may be contractually required to reduce H₂S levels to near-zero before export. Large volumes of H₂S scavenger may be required to meet these export specifications, creating logistical challenges in offshore, space-constrained locations.

Devaluation of Your Product

H₂S removal tariffs may be levelled when sour fluids are exported.

Mitigating Reservoir Souring - Our Services

Our Production and Integrity Assurance team can provide you with the knowledge to manage risks and make informed, cost-effective decisions. We offer:

- **Field services** to map H₂S production and undertake bacterial contamination surveys to further define bacterial populations.
- **High-level risk assessments** of sweet fields that may start to experience microbiological reservoir souring, or the change in risk by implementing new production strategies, e.g. produced water reinjection.
- **H₂S forecast studies** for fields at risk of reservoir souring, or where reservoir souring is already taking place, we can undertake a study to forecast the likely concentration of H₂S over the life of the field.
- **Simulated reservoir studies** to determine the efficacy of chemical treatments and the doses of such treatments required to limit and control H₂S production by SRB.
- **Nitrate treatment evaluation** to assess the potential use of nitrate to prevent souring and any consequent corrosion risk due to such treatment.
- **Corrosion evaluations** to examine corrosion risks due to H₂S at current levels and at forecasted H₂S concentrations.
- **Chemical testing under sour conditions** provided from our specialist sour service laboratory, including measures of the rate and efficiency of H₂S scavengers.

Contact our global Production and Integrity Assurance team to enquire about our capabilities and how we can assist your business.

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