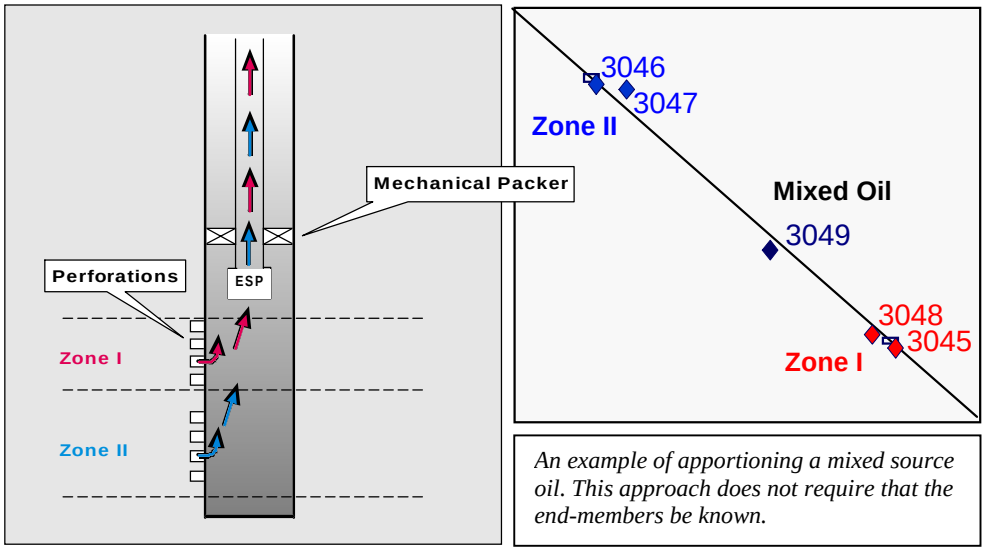
InfoMetrix®

Apportioning Commingled Oils

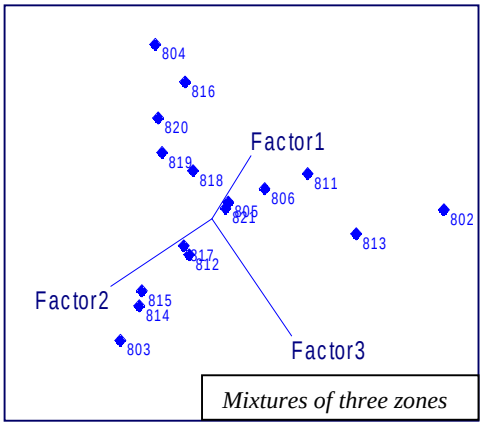
Upstream and Downstream Applications

A multivariate pattern recognition technique provides a robust means of calculating relative amounts of each component oil in a mixture. The pure end-members do not need to be known ahead of time and the interpretation can be fully automated to execute on completion of the gas chromatographic run. The technique also has the ability to identify if a suspected mixed source oil is not a match to the end members.



An example of apportioning a mixed source oil. This approach does not require that the end-members be known.

We already use gas chromatography to evaluate exploration and production samples for commingled oils caused by stratigraphic leakage and reservoir continuity. The bottleneck is in the interpretation. Once the model for a particular setting is built, the processing of newly produced oils can be done in real time without involving a geochemist. Unusual situations are automatically flagged so that an expert can be called in as the situation warrants. The technology is not limited in the number of sources to be apportioned as seen in the three-component case on the right.



Mixtures of three zones

A variety of application areas have been investigated and the technique is applicable in a series of both upstream and downstream settings:

- Underbalanced drilling
- Multizone well perforations
- Cross flow into different reservoirs
- Tubing, casing, packer leaks
- Gathering centers
- Flowlines
- Backblending
- Storage facilities

Although applied primarily to exploitation issues and management of refinery blending, there are uses in environmental apportionment to assess contributions to fugitive hydrocarbons in an objective manner.

Business Model: The advantages of the technique is that there is no lost production due to testing and the combination of gas chromatography and pattern recognition is fast and inexpensive. It is applicable to high water cut wells and can be employed to manage underbalanced drilling. If desired, these interpretations can be monitored in real time and managed by a centralized expert.

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