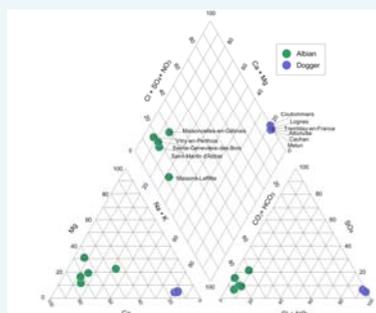


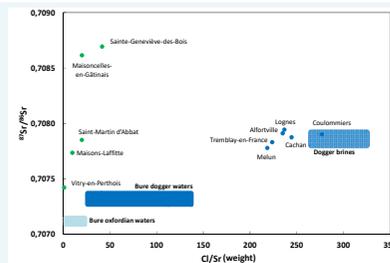
Multi-isotope systematics on the Dogger brines of the Paris Basin. Preliminary results.

Groundwaters from the deep dogger and albian aquifers are studied in the framework of the ANR-GBaseline project, in order to check for the vulnerability of the strategic albian aquifer, in case of a hypothetical non-conventional exploitation of the liassic hydrocarbons from which originate the exploited dogger and triassic oils of the Paris Basin.

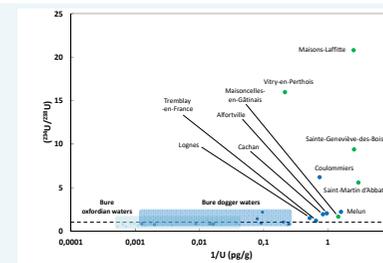
Six dogger brines from and five albian groundwaters have been sampled for physical, chemical, geochemical and isotopic parameters.



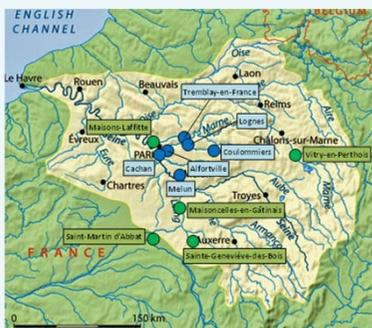
The dogger brines have (logically) a chloride – alkaline facies in the Piper diagram. Waters from the albian aquifer fall into the calcium – bicarbonate domain, except that from Maisons-Laffitte which seems to evolve towards an alkaline facies.



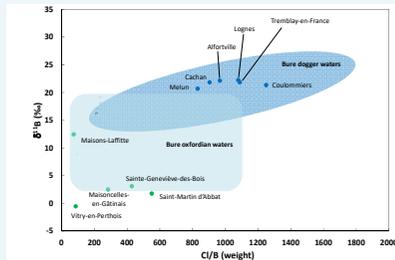
Unlike boron isotopes, Sr isotopic data depict differences between the dogger dilute waters from the Bure area and the brines, these latter having slightly higher isotopic compositions and higher Cl/Sr ratios. Data obtained previously⁽²⁾ on these dogger brines are reported in the diagram. Sr isotopic compositions of albian waters range from 0.7074 to 0.7087, with lower Cl/Sr ratios.



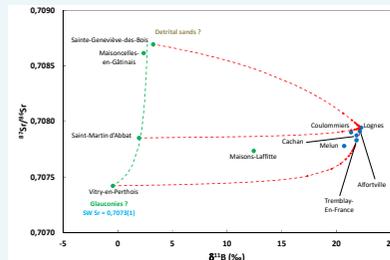
Uranium activity ratios of the dogger brines are comparable to those of dilute waters from the Bure area, with the only one exception (Coulommiers), for which brine is largely enriched in ²³⁴U. In contrast, U contents are largely lower in the brines. Albian groundwaters display a large range of activity ratios, as high as 20 for Maisons-Laffitte, with very low U concentrations.



The dogger brines were recovered from geothermal sites in the center of the Paris Basin. One albian groundwater also comes from the center of the basin. The other albian groundwaters were sampled closer or even next (Vitry-en-Perthois) to outcropping areas.



All dogger brines display comparable $\delta^{11}\text{B}$, around 20. In the $\delta^{11}\text{B}$ vs. Cl/B diagram, datapoints plot in the domain of the dilute dogger waters from the Bure transposition area⁽¹⁾. Boron isotopic signatures of albian groundwaters are much more scattered, with lower values as low as (< 0 for Vitry-en-Perthois). The domain of oxfordian waters⁽¹⁾ of the Bure is also plotted in the diagram.



On the basis of boron and strontium data, mixing curves can be calculated. The scattering of the albian data could reflect the relative geochemical influence of the two aquifer lithologies. The signature of Maisons-Laffitte groundwater could result from the very slight influence of the dogger brines (less than 1%). Such an hypothesis has of course to be confirmed (or not) by additional analyses.

Isotopic analyses ($\delta^{18}\text{O}$, δD , $\delta^{34}\text{S}$, $\delta^{13}\text{C}$, δLi , δZn) are currently underway on these water samples. Moreover, additional groundwaters will be soon recovered and analyzed for the same parameters, in the attempt to constrain as possible the potential connections between the dogger brines and the albian aquifer (Maisons-Laffitte ?). Furthermore, this raises the question of the intermediate lusitanian aquifer, for which geochemical and isotopic data are available in the Bure transposition area only, but which remains at present almost completely unknown in the center of the Paris Basin.

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