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To whom it may concern,

We are Earth Scientists concerned about the potential link between fluid pressures and seismicity in Brockham. We therefore suggest that a seismic monitoring network be installed by the BGS before any injection of waste fluids begins.

The link between evolving reservoir pressures and induced seismicity is clear, but complex. In some cases, reducing pressure due to oil extraction has triggered earthquakes. In other cases, increasing pressure due to fluid injection has induced new fractures and earthquakes.

At nearby Horse Hill, we ([redacted]) built on earlier work to quantify the relationship between oil extraction and seismicity. We argued that the relationship between oil extraction and seismicity depends on the lithology that is targeted. This is likely due to the different physical properties of the rocks, but more work is required to confirm this. Two factors prevent establishing, or eliminating, a simple link between oil production and earthquakes, leading to uncertainty. First, the seismic network, installed by the BGS, was not installed until after the first earthquakes had occurred. Second, the company operating the well has not released detailed activity information or pressure data from the wells.

The current plans to inject waste fluids at Brockham has the potential to generate seismicity and cause potentially damaging earthquakes. The planned injection pressure of 1535 psi is 93% to the fracture pressure (1635 psi, but the uncertainty on this is unknown) and is more than sufficient to generate subcritical crack growth in these rocks. We believe that injection at that pressure will involve a very high risk of generating subcritical crack growth that will accelerate to produce dynamic (seismic) rupture.

In order to avoid doubt about the cause of any potential earthquakes, a seismic network run by the BGS with data uploaded to their website would be very helpful. It would also help understand where fluids are going whether there are risks to the ground water.

Regards,

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