

## Bullock, Steph

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**From:** Phillips, Clare (ENV)  
**Sent:** 19 May 2015 10:26  
**To:** Bullock, Steph  
**Subject:** FW: Objection on grounds of geology and hydrogeology further comments by D Smythe

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**From:** Scott, Sarah (Groundwater) [mailto:sarah.l.scott@environment-agency.gov.uk]  
**Sent:** 15 May 2015 12:22  
**To:** Phillips, Clare (ENV)  
**Cc:** Molyneux, Steve; Poole, Antony; Rushton, Nicki; Seymour, Ralph  
**Subject:** RE: Objection on grounds of geology and hydrogeology further comments by D Smythe

Dear Clare

We are satisfied that our technical assessment remains correct and that the consultation response from Professor Smythe does not alter our assessment. The permits issued set out conditions needed to protect groundwater and we are confident that the environment and public health will remain protected should Cuadrilla start operations. We will not permit the use of hazardous substances for any activity, including hydraulic fracturing, where they would or might enter groundwater and cause pollution.

With regard to the specific points made in the conclusion we make the following comments:

Points 1 to 4 relate to the geological complexity of the area being greater than that shown on published geological maps. The Environment Agency agrees with this statement. This is the reason that additional work was commissioned by us during the water resources modelling work to improve the understanding particularly in the southern area of the Fylde aquifer where modelling difficulties were encountered. This work was subsequently supplemented by the sinking of two exploratory observation boreholes which were also used in conjunction with a large number of seismic lines, hydrogeological responses and the model output to reinterpret the understanding of the geology. This work resulted in a revised understanding of the alignment of the Woodsfold Fault and an improved understanding of the geology of the Fylde sandstone aquifer and the groundwater flow regime. As stated in the permit decision documents the water resources modelling outcomes have informed our decisions at the two sites.

Point 5 refers to a paper which the author has discussed with members of the Environment Agency. As Professor Smythe states the paper is flawed in several respects and by the authors admission in a verbal discussion with us is not an accurate representation of the hydrogeological conditions in the location. The paper seeks to develop a numerical assessment for assessing fracture impacts which it has demonstrated will work. However the data that was input into the model is by the authors' admission vague and not as accurate as it should be if it was to be used to represent what may occur in the Lancashire setting which means that the output figures have very low confidence. The Environment Agency remain confident that the conditions set out in the permits are sufficient to ensure that fracturing activities will be controlled and monitored to protect groundwater quality in the wider area.

Points 6 and 7 will be covered by the Hydraulic Fracture Plan that is required by DECC and the implementation of the traffic light system. The Environment Agency permit requires data from this report to satisfy conditions in the permit and ensure that groundwater is protected. The monitoring data will be used to ensure modification and refinements can be made to the activities to ensure that any risks to groundwater are mitigated during the life time of the operations.

Point 8 states that the issue of reinjection of produced water has not been resolved. We believe that this issue has been set out very clearly in the permits, in Schedule 1 – Operations under activity A5 the limits of activity state 'There shall be no injection of hydraulic fracturing fluid (which may include reused flow back fluid) for disposal'. This is also reiterated in the decision document in Annex 1: Consultation and web publishing, section A 2) consultation responses from Members of the Public and community organisations, under the heading 'reinjection of flow back

fluid'. This section clearly states that 'we have included a permit condition that prohibits injection of any component of flow back fluid for the purpose of disposal.'

Best Regards  
Sarah

**Sarah Scott** *CGeol FGS*  
**Senior Advisor**  
**Environment & Business**  
**Groundwater and Contaminated Land**

*The Environment Agency's "[Groundwater Protection: Principles and practice \(GP3\)](https://www.gov.uk/government/publications/groundwater-protection-principles-and-practice-gp3)", sets out how we manage and protect groundwater resources and our plans for the future.*

*<https://www.gov.uk/government/publications/groundwater-protection-principles-and-practice-gp3>*

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**From:** Phillips, Clare (ENV) [<mailto:Clare.Phillips@lancashire.gov.uk>]  
**Sent:** 28 April 2015 12:36  
**To:** Scott, Sarah (Groundwater); Molyneux, Steve  
**Subject:** Objection on grounds of geology and hydrogeology further comments by D Smythe

Dear Sarah and Steve

Further to the advertisement of further information provided by the applicant on shale gas planning applications LCC/2014/0096 (Preston New Road) and LCC/2014/0101 (Roseacre Wood), we have received the attached representation.

If you have any comments, we would be happy to receive them at your earliest convenience.

Regards, Clare Phillips

**Clare Phillips**

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\* [clare.phillips@lancashire.gov.uk](mailto:clare.phillips@lancashire.gov.uk)

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