



Department  
of Energy &  
Climate Change

Department of Energy & Climate Change  
3 Whitehall Place  
London  
SW1A 2AW

[www.gov.uk/decc](http://www.gov.uk/decc)

15th April 2014

Our ref: EIR 14/0334

Dear

Thank you for your e-mail of 18<sup>th</sup> February, where you requested the following information:

***Correspondence between DECC and Cuadrilla relating to the monitoring of methane emissions from onshore hydrocarbon exploration and extraction sites since January 2012,***

***And***

***Correspondence between DECC and the Environment Agency relating to the monitoring of methane emissions from onshore unconventional hydrocarbon exploration and extraction sites since January 2012***

We have considered your request in accordance with the Environmental Information Regulation 2004 ('the EIRs') on the basis that the information you sought disclosure of, does in our view, fall within the definition of "environmental information" as stated in EIRs.

The Department holds information falling within the scope of your request. Some of the information which we hold in relation to your request is already available in the public domain and can be found at the following links:

<https://www.gov.uk/government/publications/monitoring-and-control-of-fugitive-methane-from-unconventional-gas-operations>

[http://www.ecoconnect.org.uk/download/Environment%20Agency%20Risk%20Assessment%20for%20Shale%20Gas\(2\).pdf](http://www.ecoconnect.org.uk/download/Environment%20Agency%20Risk%20Assessment%20for%20Shale%20Gas(2).pdf)

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/237330/MacKay\\_Stone\\_shale\\_study\\_report\\_09092013.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/237330/MacKay_Stone_shale_study_report_09092013.pdf)

In addition, DECC holds some further information falling within scope of your request. Please find attached at **Annex A** further information regarding communication between DECC and Cuadrilla; and attached at **Annex B** further information regarding communication between DECC and the Environment Agency.

In relation to **Annex A**, DECC considers that some of the information that we hold is subject to exception under EIRs Regulation 13(1) relating to personal data.

In relation to **Annex B**, DECC considers that some of the information we hold, including redacted information within these documents, is subject to exception from disclosure under EIRs Regulation 12(4)(e), relating to internal communication, and Regulation 13(1) relating to personal data.

In considering the public interest in relation to these exceptions, we have applied a presumption in favour of disclosure as required by regulation 12(2) of the EIRs.

Within both annexes, some of the redacted information constitutes personal data and has been withheld. EIRs Regulation 13(1) provide an absolute exception for personal data which then falls to be dealt with the Data Protection Act 1998 (DPA). Personal data of third parties can only be disclosed in accordance with the data protection principles. In particular, the first data protection principle requires that disclosure must be fair, lawful and comply with one of the conditions in Schedule 2 of the DPA. We do not think that it is fair to release the names of junior members of staff or third parties and do not think that any of the relevant conditions apply. As a result, the personal data of staff below Senior Civil Service level and staff in other organisation have been redacted from these annexes.

In relation to **Annex B**, some of this information is internal communications and is being withheld under EIRs Regulation 12(4) (e). Releasing internal communications may assist the public's understanding of the workings of government, and is in keeping with the Governments' Transparency Agenda. However, some of the information being withheld is policy under development. Policy development is an iterative process which requires officials to propose, test and refine proposals through the life cycle of the policy development. Disclosure of this material could affect the "safe space" needed to effectively consider all aspects relating to the "monitoring of methane emissions from onshore/unconventional hydrocarbon exploration and extraction sites", and could result in officials being less candid in expressing and exchanging views, making it more difficult to bring policy formulation to a proper conclusion. This could have a detrimental effect on the conduct of Government business.

Having considered the balance of the public interest, we have concluded that the public interest in maintaining the "safe space" outweighs the public interest in disclosing the information withheld in **Annex B**.

### **Appeals procedure**

If you are unhappy with the result of your request for information, you may request an internal review within 40 working days of the date of receipt of the response to your original letter. If you wish to request an internal review, please contact:

The Information Rights Unit,  
Department of Business, Innovation and Skills,  
1 Victoria Street,  
London SW1H 0ET

or

E-mail [foi.requests@bis.gsi.gov.uk](mailto:foi.requests@bis.gsi.gov.uk).

Please remember to quote the reference number above in any future communications.

If you are not content with the outcome of the internal review, you have the right to apply directly to the Information Commissioner for a decision. The Information Commissioner can be contacted at: Information Commissioner's Office, Wycliffe House, Water Lane, Cheshire, SK9 5AF.

Yours sincerely

Office for Unconventional Gas and Oil (OUGO)

## Annex A

### Communication between DECC and Cuadrilla

#### COMMUNICATION BETWEEN DECC AND CAUDRILLA

**From:** REDACTED [<mailto:REDACTED@cuadrillaresources.com>]

**Sent:** 26 August 2013 21:03

**To:** REDACTED

**Cc:** REDACTED; REDACTED; REDACTED

**Subject:** Air Quality Monitoring

Dear REDACTED

Please find attached the baseline results conducted by Cuadrilla prior to Balcombe operations (conventional oil well). This is published on our website as part of our approach to being transparent. To help with independence, Ground Gas Solutions (GGS) are carrying out the air sampling on our behalf.

The current Balcombe Mining Waste Permit issued by the Environment Agency requires spot sampling for the following determinants. The method of sampling is Cuadrilla's decision but has to be approved by the Environment Agency:

Determinants	Method	Method of Deployment
Methane	Laser Methane Monitor TDL 500	8 hours continuous per deployment
VOC's	Sorbent Tube Sampling	Short term pump
BTEX	Sorbent Tube Sampling	Short term pump
Hydrogen Sulphide	Passive Tube Sampling	3 to 4 week sampling period on the perimeter fence line (up wind and downwind)
Nitrogen Dioxide	Passive Tube Sampling	3 to 4 week sampling period on the perimeter fence line (up wind and downwind)
Sulphur Dioxide	Passive Tube Sampling	3 to 4 week sampling period on the perimeter fence line (up wind and downwind)

The passive/sorbent tubes are located both down and up wind as per desktop analysis of the prevailing wind direction along the perimeter fence line. Sampling is conducted pre, during and after operations to provide monitoring data from the site activities. The results will be used to inform the site closure plan.

As discussed this is nothing new and similar to a lot of air quality monitoring by construction, landfill and other industry. If you require any further information please feel free to contact me.

Regards,

REDACTED

**From:** REDACTED  
**Sent:** 27 August 2013 16:45  
**To:** REDACTED  
**Cc:** REDACTED; REDACTED; REDACTED  
**Subject:** RE: Air Quality Monitoring

REDACTED

Thank you. We'll refer to the monitoring in the report.

Regards

REDACTED

REDACTED, REDACTED REDACTED. REDACTED REDACTED REDACTED, Professor David MacKay, Chief Scientific Advisor, Department of Energy and Climate Change, 3 Whitehall Place, London SW1A 2AW. T: REDACTED. Mobile: REDACTED

**From:** REDACTED  
**Sent:** 07 January 2014 10:27  
**To:** 'REDACTED; REDACTED@cuadrillaresources.com; REDACTED  
**Cc:** REDACTED; Figueira Duarte (Energy Development); REDACTED; REDACTED  
**Subject:** RE: methane measurements for shale gas extraction

Dear REDACTE, REDACTED AND REDACTED

Many thanks for coming in to present your plans for the FuME project yesterday. We were very interested to hear about your monitoring plans. Please could you provide a copy of the slides you presented? Attached is the University of Texas/ US EDF research REDACTED mentioned (**Annex A**). I believe the follow-up US EDF research will be published in the Spring, again in PNAS.

We agreed that we would keep in touch with regards to our monitoring plans, which I think this will be very valuable. We also said we would meet again in six months. Shall we put Monday 7<sup>th</sup> July as a placeholder in our diaries?

Kind regards,

REDACTED

REDACTED | REDACTED REDACTED REDACTED REDACTED REDACTED | Science & Innovation | Department of Energy and Climate Change (DECC) | Area 6A, 3 Whitehall Place, London SW1A 2AW | REDACTED | [REDACTED@decc.gsi.gov.uk](mailto:REDACTED@decc.gsi.gov.uk) | [www.decc.gov.uk](http://www.decc.gov.uk)

**From:** REDACTED REDACTED REDACTED REDACTED REDACTED  
**Sent:** 08 January 2014 17:35  
**To:** REDACTED REDACTED; REDACTED REDACTED (REDACTED REDACTED REDACTED); REDACTED REDACTED@cuadrillaresources.com; REDACTED REDACTED  
**Cc:** Figueira Duarte (Energy Development); REDACTED REDACTED REDACTED; REDACTED REDACTED REDACTED REDACTED  
**Subject:** RE: methane measurements for shale gas extraction

Hi REDACTED,

EDF (Environmental Defence Fund) are taking part in a series of studies taking in all stages of the natural gas system upstream and downstream. The only report which has been released is the study carried out by the University of Texas (which is the one you have seen), the other studies are in various states of completion.

- Gathering & processing, field monitoring is still being carried out
- Transmission & storage, the same as above
- Distribution, field data has been analysed and paper is in the process of being written.

EDF plan to have the resulting papers published in PNAS, which judging by the delay to the publication of the University of Texas study it could be summer before we see any of them.

Cheers

REDACTED



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REDACTED  
✉ [REDACTED REDACTED@decc.gsi.gov.uk](mailto:REDACTED REDACTED@decc.gsi.gov.uk) ☎ 0300 REDACTED  
Follow us on [Twitter.com/DECCgovuk](https://twitter.com/DECCgovuk)

**A Link Below is referred in the above chain of e-mails**

<http://balcombeparishcouncil.files.wordpress.com/2013/07/interim-pre-drill-environmental-monitoring-report-31-07-13.pdf>

**A copy of University of Texas/ US EDF research is attached as a separate attachment in PDF format**

## Annex B

### Communication between DECC and EA

**From:** REDACTED REDACTED

**Sent:** 01 August 2013 19:25

**To:** REDACTED REDACTED REDACTED

**Cc:** REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED

**Subject:** GHG emissions from shale gas

REDACTED,

We met during a meeting at DECC regarding monitoring of emissions from shale gas. I am project managing the MacKay/Stone report on GHG emissions which includes a section on recommendations for emission monitoring, before publishing the report it is important that it accurately states the EA's position (unfortunately REDACTED REDACTED has left DECC so now unable to fill me in on the latest) on monitoring and are aware of the report's recommendations. The draft text is below, I'm happy to discuss making changes

We are also trying to find further GHG emissions data for the UK for gas production and processing per unit of gas produced, currently the vast majority of data identified is for the US and not necessarily representative to the UK. Do you have any information that could help?

*As previously discussed, there is a large degree of uncertainty surrounding the GHG emissions from shale gas exploration, pre-production, production, processing and post production (the evidence of emissions from conventional gas production is also considered poor). The majority of GHG emissions reported in literature are based on engineering calculations and approximately measured gas flows, as yet there has not been a published comprehensive study to measure and verify emissions from a wide variety of wells and shale formations. Petron et al. (2012) were the first to report atmospheric methane emissions being four times higher than estimated through the inventory process, acknowledging the difficulties of attributing the exact source. The University of Texas are currently undertaking a first of a kind detailed study on GHG emissions from the natural gas industry, which is scheduled for publication in 2013.*

*There is currently no formal requirement on the existing permits for the shale industry to accurately monitor GHG emissions from the various stages of development; with any data being estimated using generic emission factors as is the current practice within the conventional oil and gas industry. The Environment Agency is proposing a framework of "monitoring packages" for fugitive methane[1], which identifies numerous monitoring regimes, providing variable levels of accuracy; carrying out monitoring would be voluntary.*

*The uncertainty surrounding GHG emissions from shale production suggests that an intensive monitoring regime should be mandatory before any generic emissions factors could conceivably be used. The industry being in the early stages of development, places the UK in a strong position to comprehensively measure GHG emissions and potentially find a link with the geological conditions. It is recommended that a detailed pilot scheme is set up at one site, to establish the geological conditions within the shale formation and, to identify when and where emissions are released and in what quantities. The information obtained from such a study could then be used to design detailed measurements of particular places/times/equipment where GHG emissions are known to have occurred. This should then be extended out to more sites to take into account different size/geology/equipment. The monitoring should continue for an extended period to take into account various emissions during production, such as workover and liquid unloading.*

*It is recommended that the research is independent and managed jointly between government and industry. The results should provide satisfactory evidence on whether regulatory monitoring should be mandatory and the type of monitoring required or whether it is possible to produce generic emission factors. The emissions data should also be used as a measure of improvements, such as in equipment or technology, required to ensure that all stages of shale gas exploitation use the ALARP principle for minimising emissions*

Best regards

REDACTED

**REDACTED REDACTED** | REDACTED | DECC REDACTED REDACTED REDACTED  
Department of Energy and Climate Change | REDACTED | 3 Whitehall Place | London | SW1A 2AW  
☎ REDACTED REDACTED | ✉ REDACTED | 💻 [www.decc.gov.uk](http://www.decc.gov.uk)



**From:** REDACTED  
**Sent:** 06 August 2013 19:48  
**To:** REDACTED (Science and Innovation)  
**Cc:** REDACTED ; REDACTED; REDACTED; REDACTED; REDACTED  
**Subject:** RE: GHG emissions from shale gas

REDACTED

1. Thanks for our discussion of this draft text today. This message is to confirm my suggestions on how the text might be refined to reflect developments since we met at DECC offices on 18 April, when REDACTED, REDACTED, REDACTED and REDACTED were also present.
2. We agreed that Para 1 below is a fair summary of the issues around GHG emission estimates, and of the differences found by Petron et al between emissions inferred from (a) generic factors, and (b) measured concentrations in the atmosphere. Para 1 usefully sets the scene for later paras re. the need to quantify airborne emissions of GHG (and other substances).
3. On Para 2 below, I explained that, since April, there have been significant developments in the Environment Agency's approach to regulation of onshore oil and gas sites. In particular, the Agency is no longer making a distinction between "conventional" and "unconventional" oil/gas sites, but it is now developing a more harmonised approach to its regulation of all onshore exploration/production sites for oil and gas. As part of this new approach the Environment Agency is also expecting that an Environmental Impact Assessment (EIA) will be required as part of permit applications for new exploration/production sites. In order to reflect these developments as succinctly as possible, I suggest that Para 2 could be changed:

*The Environment Agency's latest approach to permitting of shale-gas exploration sites requires that permit applications will have an environmental impact assessment (EIA) that includes releases to air. The Agency will review the EIAs for individual sites in order to determine if there is a need to quantify their releases, and if so it may require that monitoring or other methods are used for that purpose. The Environment Agency's latest approach is to harmonise its regulation of all onshore sites for exploration and production of oil/gas, so that the regimes for "conventional" and "unconventional" sites are similar. The Environment Agency is reviewing the considerations to be addressed when quantifying fugitive methane releases to air from shale-gas exploration sites. This review will help with designing appropriate monitoring regimes and with identifying situations where generic emission estimates may be used, or where they may need to be developed.*

4. We agreed that Para 3 below is properly explaining that there is a need to understand and quantify releases to air under UK conditions, and that it may not be appropriate to use generic emission factors developed for conditions overseas. We also agreed that Paras 4 and 5 are reasonable conclusions/recommendations.
5. REDACTED: a minor point of terminology I just noticed in Para 5: as it happens, I have only encountered the "ALARP" principle in relation to release of radionuclides, and not in relation to non-radioactive releases – for which BAT (Best Available techniques) is the appropriate/equivalent principle. You may therefore like to replace ALARP with BAT in order to avoid any intimation of radioactive releases. Of course, your experience and mine may differ, so that if you feel that ALARP is still the right term for oil/gas regulation I'm happy you retain it.

I'm copying my Agency colleagues from REDACTED, Also REDACTED and REDACTED who are covering for REDACTED while he's on leave. Also my line manager REDACTED.

I hope above fairly reflects our discussion – for which again many thanks.

Regards

REDACTED

REDACTED

**From:** REDACTED REDACTED REDACTED REDACTED REDACTED  
**Sent:** 10 January 2014 12:35  
**To:** 'REDACTED REDACTED'  
**Subject:** FW: methane measurements for shale gas extraction

Dear REDACTED,

Many thanks for a really useful discussion just now. Here are the slides from the meeting we had with NPL/Caudrilla this week with contacts details at the end. REDACTED didn't mention these were confidential in anyway, but perhaps you can double-check that when you get in touch with REDACTED before circulating to any others? I look forward to hearing the outcome of your discussion and feedback from REDACTED in your technical team. Perhaps we can have a catch-up next week?

Kind regards,

REDACTED

***The slides mentioned in this e-mail are attached as a separate PDF File.***

REDACTED REDACTED | REDACTED REDACTED REDACTED REDACTED REDACTED | Science & Innovation | Department of Energy and Climate Change (DECC) | Area 6A, 3 Whitehall Place, London SW1A 2AW | REDACTED | [REDACTED REDACTED @decc.gsi.gov.uk](mailto:REDACTED REDACTED @decc.gsi.gov.uk) | [www.decc.gov.uk](http://www.decc.gov.uk)

**From:** REDACTED REDACTED  
**Sent:** 07 January 2014 16:05  
**To:** REDACTED REDACTED REDACTED REDACTED REDACTED; REDACTED REDACTED; REDACTED REDACTED  
**Cc:** REDACTED REDACTED; Figueira Duarte (Energy Development); REDACTED REDACTED REDACTED REDACTED; REDACTED REDACTED REDACTED REDACTED  
**Subject:** RE: methane measurements for shale gas extraction

REDACTED REDACTED

Thanks for organising the meeting. I've attached the presentation we made yesterday.

Thanks also for the attachment - I'd misunderstood as I'm aware of this one - I thought Phil mentioned a different study on leaks from the gas grid.

We had a discussion about the GWP of methane number in the slide - 34 is from AR5 including climate-carbon feedbacks ([http://www.climatechange2013.org/images/uploads/WGIAR5\\_WGI-12Doc2b\\_FinalDraft\\_All.pdf](http://www.climatechange2013.org/images/uploads/WGIAR5_WGI-12Doc2b_FinalDraft_All.pdf) in Chapter 8 on p. 1071, table 8.1). GWP 28 is minus the feedbacks. It sounded from the blurb surrounding the table that they're including the feedback from now on like they do for CO2, so I only included the one number. So thanks for highlighting it - from now on I will include both!

I'm afraid I can't do 7th July as I'm away that week. How about Tuesday 1st July?

All the best  
REDACTED