

# METHODOLOGY TO ASSESS METHANE LEAKAGE FROM AD PLANTS

## Ricardo's response to comments from peer review

The methane monitoring methodology was developed for this project with the intention of using it as part of a wider comprehensive measurement programme. The intended purpose of this programme is to estimate methane emissions and corresponding GHG savings from different types and categories of AD plants across the UK. This large-scale comprehensive measurement programme would be a major undertaking and so will require a practical and cost-effective methodology so that it can be applied to as many sites as possible. The shortcomings of the methodology are summarised in the reports. This methodology can be adopted and used in combination with other techniques to provide the necessary results.

The peer review provides very useful comments and we accept many of the issues raised. In addition, many of the comments given in the critique of the methodology reflect the content of the report (Part II). However, we have some specific areas where we feel a response is required.

### **Background environmental conditions**

Whilst the baseline measurements before construction and operation of an AD facility could be helpful, this is not an option for existing AD plants and the project scope, as highlighted above, was to prepare a methodology that could be applied to existing AD plants in the UK.

Note that a baseline survey before commencement of plant operation is something that is occasionally considered in planning conditions for major or sensitive projects but may not be proportionate for AD plants. Also, whilst a baseline survey before operation is undertaken at development to assess changes in (typically) air quality concentrations, determination of emission rates estimated from concentration data measured over different monitoring periods will also have uncertainties.

### **Sampling methodology**

The proposed methodology seeks to avoid data from periods of low (and high) wind speed as emission rates calculated from such periods would have higher uncertainty. The aim is to apply a general approach in appropriate circumstances

rather than trying to use data in periods where wind speed and wind direction or other factors would lead to high uncertainty.

### **Instrument layout**

The pilot study had limited resources and consequently monitoring systems were installed in upwind/downwind (and were rearranged when wind direction changed). The intention for longer term monitoring would be a clockface arrangement of monitoring instruments – in such an arrangement there should always be an upwind/downwind pair of instruments. However, as described in the report, other factors will also constrain where monitors can be installed.

### **Pilot study**

*Sampling height* - Note that a survey at various heights was undertaken during the course of the pilot study. Some higher concentrations were found and reported at heights above the 1m monitoring location.

*Detectors* – ideally instrumentation would be the same but these were the devices available during the study.

*Instrumentation layout* – details of monitoring locations were recorded however, specific details were not included for the pilot study as there were constraints around the potential identification of the measurement site

*Environmental baseline* – see comments above, this methodology was not intended to provide a before and after assessment of a new site. The 1-2 ppm ambient concentration is commonly accepted and confirmed by measurement for this location. The assessment of the difference between upwind and downwind concentrations is explicitly to avoid (as far as possible) contribution from other sources

*QA/QC protocols* – we acknowledge that some low concentrations were found but note that the data reported are a mix of spot readings and 30 minute averages (short-term concentrations as opposed to longer term averages). No concentrations of 0ppm methane were reported, however a 0ppm ‘uplift’ in methane concentration between upwind and downwind measurement locations across was reported.

### **Conclusion**

The recommendations provided in the peer review are reasonable recommendations but note that a baseline prior to operation of an existing AD plant is not possible. We believe that the monitoring methodology has limitations but serves the purpose it was designed for as it offers a cost-effective practical approach. Further work should involve further verification of the methodology and an extended pilot study which tests for a wide range of parameters.