

## Comments from the BC Oil and Gas Commission

on

### Mobile measurement of methane emissions from natural gas developments in Northeastern British Columbia, Canada

Jun. 1, 2017

The British Columbia Oil and Gas Commission (Commission) is the provincial regulator for the oil and gas industry. Depending on the activity the Commission is either the primary regulator, or works with other regulatory agencies to ensure activities are managed for the benefit of British Columbians. In August 2016, the province released the BC Climate Leadership Plan (CLP) which set a goal to reduce methane emissions from the upstream natural gas sector by 45 per cent below 2014 levels by 2025 from extraction and processing infrastructure built before Jan. 1, 2015. The Commission is working with the B.C. Government to determine how to effectively meet this CLP goal.

The Atmospheric Chemistry and Physics discussion paper is of considerable interest to the Commission. Therefore, we have reviewed this discussion paper to determine if the findings agree with the regulator's extensive understanding of the oil and gas sector from the perspectives of protecting public safety, respecting those affected by oil and gas activities, conserving the environment, and supporting resource development.

Relevant to this discussion paper is that the Commission performs 4,000 to 5,000 inspections per year on oil and gas infrastructure and if methane releases are identified during an inspection, deficiencies are noted and industry is required to take corrective action. Also, routine checks on wells for surface casing vent flow are performed and if significant leaks are found industry is required to take corrective action.

In reviewing this discussion paper, considerable discrepancies were noted between the study findings and the Commission's understanding of oil and gas infrastructure within B.C. Our findings are as follows:

#### **Overall:**

- **Location of infrastructure:** The facility data downloaded from the BC Oil and Gas Commission has NTS or DLS coordinates which are accurate to approximately 400 by 400 area. The discussion paper should provide clarity on whether the NTS or DLS locations were used or if and how the study refined the locations.
- **Emissions attribution:** There are numerous situations where multiple permits are issued by the Commission at the same general physical location. The discussion paper does not address how this was handled. When a methane plume is detected the discussion paper should indicate how this is attributed to a source when multiple wells and facilities are attributed to the same geographic location. How was a single release anomaly tied to estimating releases that could be tied to multiple permits at the same physical location?

- **Emissions rates may be overstated due to the use of averages:** In calculating emissions, the STFX/DSF study assumed, even for facilities that had emissions detected just over 50 per cent of the time, that their leak rate was constant and ongoing. The study noted that, especially with venting emissions, the release of methane may not be constant. This assumption has high potential to lead to an overstatement of methane emissions.

Specific discrepancies within the text are as follows:

Page 8 line 22 Well status of:

- “Cancelled” means the well permit expired without drilling commencing. So these wells do not physically exist in the field and can not be attributed to the release of methane.
- “Well Authorization Granted” (WAG) means that a well has been approved, but drilling has not commenced. Therefore these can not be attributed to methane releases.

Page 8 line 23

It is difficult to understand how the text “for the class defined in the databases as Well Authorization Granted, most of which were somewhere in the stages of development during our visits” could be correct. While some wells with a status of WAG would have commenced drilling between the time the well data was acquired in July 2015 and the study completed Sept. 5, 2015, this number is quite small compared to the total number of wells with a status of WAG. While it is unclear when in July 2015 the researchers obtained well data from the Commission, if we assume the data was obtained on July 1, 2015, there were 1,797 wells with a status of WAG. Between July 1, 2015 and Sept. 5, 2015, 146 of these wells commenced drilling. As this data is for all of northeast B.C., a subset of these wells are located in the study area. In any event, a maximum of 8 per cent of WAG wells were somewhere in the stages of development during the field visits and the remaining 92 per cent did not physically exist at the time of the study and therefore were incapable of emitting methane.

In conclusion, for page 8 line 22 the text should be revised from “25% for Cancelled” should indicate no releases from cancelled and “27% for well authorization granted” should read close to zero for well authorization granted.

Page 9, line 5

The text refers to a category of “Undefined”. It should be noted the term “Undefined” is not used to describe the well status (Well Authorization Granted, Drilling, Cased, Completed, Active, Cancelled, Suspended, Abandoned). “Undefined” is used to describe the well operational status (Production, Injection, Disposal, and Observation). For example, a cased well would have an operational status of undefined since it was never completed. In addition, undefined is used for the well fluid type (Gas, Oil, Multiple Gas, Multiple Oil, Multiple Oil and Gas or Water) if a well has not flowed in order to define the fluid type. For example, a well that was completed, but did not flow when tested would have an undefined fluid type. An active water disposal well would have a status of ACTIVE WATER DISPOSAL, not UNDEFINED.

Page 11 Line 11 to 18

The development of the MDL or release rate in the study involves significant uncertainty which is not adequately discussed in the text. Further information should be provided on the laboratory experiments used to determine a mean level of dilution of 70 per cent to demonstrate “realistic field conditions” and should include the range of results from those experiments.

Page 11, line 19 to 32

NOAA states that the Gaussian dispersion model is recommended as a teaching tool to understand basic concepts and does not recommend its use for dispersion studies. This paper should answer the question as to why this particular model was used when there are a multitude of other dispersion models to choose from.

Regardless of the dispersion model used, a sensitivity analysis should be completed for the main inputs used for the analysis in this study. As currently written, it is unclear which meteorological inputs (wind speed, wind direction, temperature, etc.) the researchers used, and whether they were representative of the region. Dispersion modelling can be highly sensitive to input parameters, and as such a further discussion of this uncertainty should be included, especially as the outputs from this modelling are used to determine as the release rate and to estimate a regional emissions inventory.

In conclusion, for Page 11 (lines 11 to 32), the technique used to develop the emission factor of 0.59 g/s is questionable.

Page 12, line 20

The term “facility” in the Omara study refers to the sum of wells and equipment at a multi-well site. Facility type as outlined in Figure 8 of this study is not the same as defined in the Omara study. There is no basis for using the emission factor 2.2 g/s in this discussion paper.

**Conclusion and Recommendation**

The fact significant quantities of emissions were attributed to wells that do not exist (i.e. 25 per cent of cancelled wells were reportedly emitting) calls into question the accuracy and validity of the discussion paper. Also, the basis for determining emission factors used in this discussion paper is highly questionable - therefore, this study should not infer that the estimates constitute an emission inventory that could be compared with what is reported under the Greenhouse Gas Emission Reporting Regulation. The Commission would welcome further dialogue to improve this study prior to publication.