# 3.020 Coal seam gas and air quality in the Surat Basin, Australia: monitoring and modelling the impacts.

Early Career Scientist

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Abstract:

Coal seam gas (CSG) production has expanded rapidly in the state of Queensland, Australia in the past decade, driven by three major CSG to liquefied natural gas (LNG) export projects. The Surat Basin, a predominantly agricultural region with vast gas reserves, is the hub of this development.

A new ambient air quality study has been instigated in the Surat Basin as part of the Gas Industry Social and Environmental Research Alliance (GISERA), a partnership between the federal government's Commonwealth Scientific and Industrial Research Organization (CSIRO) and industry partners. This is the first comprehensive air quality study to be undertaken in an unconventional gas region of Australia. The study involves monitoring $NO_x$, $O_3$, total VOCs, CO, $CH_4$, $CO_2$, PM2.5 and PM10 at three ambient air quality sites in the heart of the gas fields, and $NO_x$, $O_3$, CO, $CH_4$, $CO_2$ at sites upwind and downwind. Ambient air quality data will be live streamed to the Queensland Government air quality site, ensuring maximum transparency for concerned communities. Additional measurements include ambient passive speciated VOC, aldehyde and $H_2S$ measurements, and detailed characterization of potential CSG related emission sources, including fugitive gas, gas fired compressors and engines, feed pond water and naturally occurring radioactive materials.

A CSIRO meteorological model coupled with a chemical transport model is being used to examine the distribution of primary pollutants (including $NO_x$, CO) in the Surat Basin as well as secondary pollutants (including $O_3$ and secondary PM). The study will explore the contribution from the CSG industry and other sources to observed levels of pollutants

over one year at 1km, hourly resolution.
We provide an overview of the study and some preliminary ambient air monitoring data, gas composition data, and air quality modelling results. Future unconventional gas development in Australia will be discussed, with potential implications for air quality.