

6 April 2017

Secretary
Planning & Environment,
Level 22 320 Pitt St Sydney NSW 2000,
GPO Box 39 Sydney NSW 2001

Dear Sir/Madam

**I OBJECT TO THE NARRABRI GAS PROJECT ON THE FOLLOWING GROUNDS: FAILURE TO
MITIGATE HAZARDS TO ASTRONOMY**

Ref: EIS Appendix Q (GHD) and section 5.3.3; SSD 14_6456

Santos has failed to ensure that vital astronomical assets of the Commonwealth of Australia, and 50 other international research institutions, are not detrimentally impacted by the operation of a large gas field and gas processing equipment to the north of Siding Spring.

Over the years, major public funds have been invested in these world class facilities for astronomy. Australian taxpayers and science institutions are rightly deserving of protection of this asset.

There is no recognition of the cumulative impact of future expansion from PEL238 to other gas licence areas much closer to the observatory.

Santos has not proposed adequate mitigation measures to protect the observatory operations, particularly in not ensuring the clarity of the night sky from light pollution impacting negatively on visible light telescoping, and from not preventing an increase in chemical air pollution impacts on delicate instrumentation and mirror surfaces. It has also not recognised or mitigated chemical air pollution impacts on the Narrabri radio telescope facilities.

There is no recognition in the Santos EIS that air pollution (Chapter 18) at times will concentrate in certain weather conditions, such as during temperature inversions or cloudy, still nights and drift southward towards the observatory. Air pollution from gas fields is well-documented but has not been correctly identified in Chapter 18. It comprises methane, ethane, butane, and some higher hydrocarbons that can form ozone smog in sunlight, especially mixed with flaring combustion products like nitrous oxide. There is also hydrogen sulphide. This air pollution is not documented in the EIS by Santos. Gas field smog is highly corrosive on delicate instrumentation and can cause smog haze.

Santos has failed to propose adequate mitigation measures to minimise the impact of light pollution from flaring operations - in fact, no flare shielding is proposed. Two major flare stacks will likely operate continuously at Bibblewind and Leewood. Santos has underestimated the likely continuous operation of these stacks and not proposed adequate shielding.

Santos has under-estimated the amount of light pollution and has contradictory statements in the EIS about the number of flares – at one point it is stated that there will be 'up to 6' (5.3.3) pilot well flares, but in other parts of the EIS it is estimated over 25 pilot flares (Greenhouse Gas Chapter 24) will be operational at any time.

The NSW EPA recommends that flare stacks be shielded.

Appendix Q mentions the potential high light pollution impact of major flare events but 'talks down' the frequency of such events. This is NOT the experience in the QLD coal seam gas fields. The Santos EIS does not reflect practical, on the ground experience of coal seam gas field operations.

The reality of gas fields is that gas supply restrictions mean that gas flaring can occur whenever the market is not drawing gas from the Project. This means that flaring can be a constant feature of an operational gas field. Claims by Santos that flaring will be minimal are simply not supportable.

It is inconceivable that the negative impacts of the Project on Siding Spring would be acceptable to Australian and international astronomers nor to the Australian public who have heavily invested in these world class facilities.

I do not consider light and air pollution that will be caused by the Project has been effectively mitigated by Santos's proposed mitigation measures.

These operations by Santos not only threaten to degrade our land, air and water but to destroy our window to the universe.

