

Armidale Branch of National Parks Association  
PO Box 372  
Armidale NSW 2350  
20 May 2017

**Re : Santos EIS Narrabri Gas Project 2017**

The Armidale Branch of the National Parks Association (NPA), established in 1974, has a long association with the Pilliga. Our members have an appreciation of unique forest habitats and share our knowledge of flora and fauna and our respect for traditional cultural values by conducting regular tours to the region.

We support local business on these tours by staying in accommodation and purchasing supplies from local stores.

The Pilliga forest is the largest intact woodland in eastern Australia, It is a unique ecological refuge, home to 25 nationally listed and 48 state-listed threatened species, such as the Pilliga Mouse, which rely on the Pilliga for survival.

**Armidale NPA objects to the Santos proposal and Santos EIS Narrabri Gas Project 2017 on the following grounds. :**

**Water :**

The EIS does not adequately address the risks to groundwater aquifers within Pilliga east forest. More data is required by independent assessment as to the risk of water removed for CSG extraction that could severely reduce water pressure in the recharge areas with the potential for stopping the free flow of waters to the surface at springs and bores across the whole Great Artesian Basin and for the watercourses in the Pilliga that run into the Namoi River—a part of the Murray Darling Basin.

References in the EIS states (Santos 2017 (a) (b), appendix F regarding ‘water draw down’ are inconsistent throughout the document and the data in the EIS is therefore inadequate and insufficient to assess this vitally important subject.

Lowered water tables have local landowners concerned about effects on their food producing properties. The community is also concerned about the adverse impact on forest habitats if the water table level drops thus inhibiting native vegetation growth. This in turn will impact fauna of the Pilliga and region and not only the endangered species referred to in the EIS (Santos, 2017 (c)), but also all other local native species unacknowledged in the EIS.

**Therefore we recommend that the Narrabri Gas Project be refused.**

**Biodiversity:**

The Pilliga is one of 15 nationally listed ‘biodiversity hotspots’ and is vital to the survival of threatened species like the Koala, Spotted-tailed Quoll, Black-striped Wallaby, Eastern Pygmy-possum, Pilliga Mouse and South-eastern Long-eared Bat. The forest is home to over 200 bird species and is internationally recognised as an Important Bird Area.

Santos admitted in 2013 (Biblewindi Exploration Pilot Expansion EIS) that their CSG exploration would destroy habitat for the Pilliga Mouse, but tried to minimise

potential impact by stressing that their clearing is only a small percentage of the total area, but this is not a relevant consideration.

The breeding status and population dynamics of the threatened species in the Pilliga are very poorly understood.

There should be baseline ecological surveys to assess the population dynamics and status of the Pilliga Mouse, Eastern Pygmy Possum and Barking Owl, Regent Honeyeater, Swift Parrot, Superb Parrot and Painted Honeyeater and to underpin any proposed mitigation measures.

Pilliga is also recognised as an Important Bird Area listed in 2009, by Birds Australia in a report on Australia's 314 Important Bird Areas (IBAs), areas recognized as globally significant sites for bird conservation.

The Pilliga forest is found to be of "National Significance" according to the report of a study carried out by independent ecology experts in October 2011.

It identifies a number of important species not noted previously and the risks from coal seam gas mining.

The report was available to Santos but has not been acknowledged in the EIS. The Santos gasfield would fragment 95,000 hectares of the Pilliga with well pads, roads, and water and gas pipelines—damaging vital habitat and threatening the survival of endangered species.

**Armidale NPA believes that the EIS for the Santos Narrabri Gas Project is incorrect in stating that the project will have negligible impacts on biodiversity and therefore requests that the Narrabri Gas Project be rejected**

### **Spills and contamination:**

There have been over 20 reported spills and leaks of toxic CSG water from storage ponds, pipes and well heads and Santos has been found guilty and fined over their environmental mismanagement.

Armidale NPA has viewed some of the spills and leaks from existing Santos wells.

In the pilot study, from 50 wells in the pilot stage, Santos has reported 20 spills. Produced water with added chemicals to the wells or that may be released from the pressure in fractured coal seams can result in contaminants including carcinogens, teratogens, and poisonous substances, such as benzene, toluene, xylene, ethyl benzene, uranium compounds, lead compounds and cadmium compounds. Santos has contaminated a freshwater aquifer in the Pilliga with uranium at levels 20 times higher than safe drinking water guidelines, as well as lead, aluminium, arsenic and barium.

The procedure cannot be deemed safe if 5% of wells in the first year are predicted to fail and others fail in the future. Santos has not managed the existing wells competently with regard to the safety and the well-being of the environment and peoples' health.

We are also concerned about the amount of salt waste resulting from the expanded project. Between 17,000 and 42,000 tonnes of salt waste would be produced each year. Santos does not adequately cover the problem of safely disposing of the hundreds of thousands of tonnes of salt that will be produced.

With Santos' poor environmental record, there could very well be a terrible toxic inheritance for future generations of people, plants and animals.

In the the Narrabri Gas EIS the planned siting of wells is incomplete as it does not included a detailed plan for the whole field.

Therefore the EIS is not an adequate document and creates doubt that Santos is competent to evaluate, plan, manage and respond to the environmental, social and legislative responsibilities involved with such an important large project.

**Armidale NPA does not have confidence in Santos environmental credentials and therefore objects to the proposal for additional wells, and urge that the Narrabri Gas EIS should be rejected.**

### **Fragmentation:**

Fragmentation is recognised as a KTP or key threatening process endangering native flora and fauna and will have a devastating effect on the last large remaining forest and woodland that, despite impacts to date, is still fairly intact.

Although Santos considers the additional construction of 850 wells as having ‘negligible potential impact,’ the EIS fails to address the considerable impact that the large increase of infrastructure will really have on this area

NPA has viewed on the ground the impact of the existing number of wells on the Pilliga forest and know that the extra 850 wells with all the associated roads and infrastructure will severely cause fragmentation of the Pilliga forests.

It is impossible to rectify or mitigate the destruction of this area by ‘offsets’ that cannot replicate the Pilliga’s unique qualities.

Given that, as far as we can determine from the EIS, that there will 430 well pads consisting of 1 hectare each of cleared area plus the amount of areas that are connected by 446 km of cleared infrastructure corridors consisting of 430 km of gas & water pipelines and connecting tracks plus 16 km of road for Bibblewindi and Leewood plus an unknown number of seismic lines, plus an unknown number of firebreaks, given the high bushfire risk the amount of disturbance is considerable.

Santos needs to provide much more substantive details in their EIS. Given the amounts of clearing that we can determine from the data in the Santos EIS plus the unknown amount of habitat as depicted above, the proposed extra wells will chop up and fragment the ninety five thousand hectares of the Pilliga Forests into a series of fragments bordered by gas well pads, pipelines and roads that will have huge cumulative negative impacts such that we might as well say goodbye Pilliga Forest.

The fragmentation will result in the loss of foraging and breeding habitat for all threatened woodland birds and animals, and may lead to invasion of predatory species, feral animals and weeds.

**Therefore we strongly object to any further incursions and intrusions caused by new wells and well pads leading to the destruction of the integrity of Pilliga forests.**

### **Other Risks:**

## **Fire:**

With 24 hour a day methane flares running even on total fire ban days and with the Pilliga a fire risk area, it is unacceptable to increase the number of wells and therefore the number of flaming flare stacks as well as extra gas lines and transportation of gas.

## **Corrosion of well materials:**

The EIS does not adequately address the problem associated with the corrosion of steel and iron mechanical parts in the current and the future infrastructure, even though it is known that iron and steel plant and its infrastructure will fail from natural corrosion over time caused by water, oxygen and saline.

It is important for the EIS to describe in detail how Santos will maintain plant and how it plans to replace equipment and infrastructure not only during the life of the current and proposed project but beyond the life of the project. That is what happens long-term when the project has finished its life?

We have seen all too often that governments are left with derelict machinery and old mines to rehabilitate and therefore it is the tax payers who pick up the tab for (often toxic and health threatening) mess left behind when the mining is depleted.

**The EIS does not provide adequate information relating to the maintenance of metal infrastructure.**

## **In a wider context:**

### **Coal seam gas and climate change**

Methane is by far the major component of natural gas, and is a greenhouse gas 72 times more powerful than CO<sub>2</sub>. CSG fields contribute to climate change through the leakage of methane during the production, transport, processing and use of coal seam gas.

Given that despite Australia being a major gas exporter, Australians pay more for domestic gas than Japanese pay for our Australian gas, it is necessary for our government to redress this imbalance, rather than permitting more production and therefore contributing to climate change.

### **Observatory**

The Siding Springs Observatory, in the Warrumbungles is under threat from the Narrabri Gas Project due to light and dust pollution. The area has been internationally recognised as a 'dark sky park' and is an important contributor to the local economy through staff salaries spent locally as well as tourist dollars.

The 50m high gas flares proposed by Santos threaten the viability of the facility.

### **Health:**

There can be a range of hydrocarbons and volatile organic compounds released into the air from coal seam gas operations, including flaring of gas wells. The effects of volatile organic compounds vary, but can cause eye, nose and airway irritation, headache, nausea, dizziness and loss of coordination as evidenced by people living

near to existing gasfields in Queensland. It is timely to curtail the expansion of gas fields.

**Risks in fracture of rock strata :**

***(Information supplied by Dr Fleming PhD in Chemistry and experience in industry OH&S and permission granted to quote ) :***

*The planned wells in the Narrabri Gas EIS will pass through several different rock strata. Each layer possesses different properties, porosity, water content and pressures. All layers above the targeted coal seam must be breached to enable access to the desired coal seam. The integrity of each of these layers, including the significant recharge conduit for the Great Artesian Basin, and the capping layer retaining the coal seam gas within the coal seam, will be breached. Faulting is present in the Jurassic and Permian deposits. Santos acknowledges the risk, although its significance is played down, in the Narrabri Gas EIS (Santos, 2017(a)).*

*When pressurised fracking occurs, not only is the coal seam split, liberating the adsorbed coal seam gas, but the isolating cap rock and the rock layers it supports will also fracture, permitting interchange of liquids and gases between the rock layers and the ground surface.*

***a. Effect on liquid retention***

*Mixing of waters between the surface, subterranean aquifers and coal seams will occur as waters percolate through the fractured rock strata. Contamination of the surface, each aquifer, and the coal seam will result.*

***b. Effect on gaseous movement***

*The pressurised coal seam gas will be forced upwards along the pressure gradient towards lower surface pressures. Contamination of the surface, each aquifer, and the coal seam by fugitive gas is a predictable and significant outcome.*

***c. Effect on surface environment***

*Fugitive gas and liquids, as well as solid and liquid spills, are spread by wind, rain and physical movement (e.g. truck tyres). Surface soil, water and aquifers will be contaminated. Fugitive gas will infiltrate and contaminate the local atmosphere.*

***d. Effect on environmental (including human) health***

*The release of fugitive gas and waters from the coal seam will contaminate all subterranean and surface aquifers, soils and the atmosphere. Fugitive gas contains carcinogens, teratogens and other poisonous substances, which will affect humans, other animals, plants, bacteria and viruses.*

**The methodology of the Narrabri Gas EIS is unsafe and should be rejected.**

## **MSDS**

*The Narrabri Gas EIS lists a number of substances Santos proposes to use in its drilling and fracking programmes. I have been unable to find MSDS for these and other substances when applied to their particular process for which they have been selected. Without appropriate MSDS details for each substance as used, the safety of each chemical cannot be determined. These chemicals cannot be assumed safe.*

*The proposed extraction procedure is flawed and designed to fail. Planned sitings of wells and MSDS provisions are incomplete. Corrosion of proposed plant and infrastructure will ensure the failure of 100% of wells over time. Contamination of, and reduction in recharge capacity of the aquifer feeding the Great Artesian Basin, will occur. The drilling and fracking process will fracture the cap rock and higher strata permitting fugitive gas escape to the surface. Water mixing and contamination of all aquifers will occur. The predicted small surface water drawdown is unjustified in the EIS. Any drawdown will impose a future change in land use for this 'food bowl'. The Pilliga State Forest will itself be endangered, as will its already endangered species. High spill rates from the pilot project question Santos' competence in conducting a significantly extended gas field. The proposed Narrabri Gas field appears inappropriately selected, and researched and the EIS incompletely prepared.*

**End of quote from Dr Fleming**

**The Narrabri Gas EIS is incomplete and unacceptable and should be rejected**

## **Community :**

Since the 1970s Armidale NPA has been visiting the Pilliga and adjoining areas and has forged many contacts and friendships in the region's towns and rural properties. Over this time, Armidale NPA members have stood with the local community, attending meetings and protest actions.

Hundreds of farmers and local townsfolk have participated in protest actions.

In other words, the concern over CSG expansion in this Region is not driven by "greenies" or folk from the big smoke but people who are living with the consequences of CSG mining on their doorstep.

Armidale NPA supports the concerns of the traditional custodians, the Gamilaraay, who are opposed to the proposal by Santos. We respect their cultural traditions, their efforts to care for country and their belief in the special qualities of not only the above ground landscape but also of the water below, a concern for the whole area and not just the for those places special to them that are currently protected by legislation.

**Armidale NPA considers that the Santos Narrabri Gas EIS is an inadequate and incomplete document.**

**We trust that government agencies will responsibly consider the present and potential impacts on the environment and the concerns of community.**

**We request that our government rejects the proposal by Santos to expand the Narrabri gas project.**

**Lynne Hosking  
Vice President  
Armidale National Parks Association**

#### References

Santos, 2017(c) Narrabri Gas EIS, Chapter 4, *Section 4.6.1*, page 31-32

Santos, 2017(a) Narrabri Gas EIS, Chapter 12, *Section 12.4.2*, page 12-23

Santos, 2017(b) Narrabri Gas EIS, Appendix F, *Sections 8-9*

Santos Appendix J1 Executive Summary: 'It is unlikely that project would have a significant impact on the threatened ecological communities, threatened flora and threatened fauna that are considered potential or likely or are known to occur in the study area provided the proposed avoidance, minimisation and mitigation measures are applied. Residual impacts on threatened species and ecological communities will be offset as part of a Biodiversity Offset Strategy in general accordance with the NSW Biodiversity Offset Policy for Major Projects.'

"Biodiversity hotspots of Australia" by the Federal Environment Dept. See SEWPAC 2009, <http://www.environment.gov.au/biodiversity/hotspots/national-hotspots.html>.

This Commonwealth report specifies the Brigalow Belt North and South as a biodiversity hotspot, one of 15 in Australia and only 2 in NSW. The biodiversity hotspot concept identifies "exceptional concentrations of endemic species that are undergoing exceptional loss of habitat."

**The Santos project overlies the bulk of the Brigalow Belt South**