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Santos' Narrabri Gas Project - Response to Submissions (RTS)

Does the additional information provided in the RTS satisfactorily address the concerns raised in my submission of 14 May 2017?

Unfortunately, most of the concerns raised in my 14 May 2017 submission on the EIS have not been satisfactorily addressed in Santos' RTS.

Some of these concerns have been ignored, others are quoted as included in submissions but are not further discussed, and others are answered by simply reiterating sections of the EIS without elaboration.

I have dealt with my major issues of concern with respect to impacts on vertebrate fauna, and in particular on threatened species, under the headings adopted in the RTS.

RTS 6.15.1 Flora and fauna baseline data - Survey effort and low capture rates

Effort for particular species and low capture rates compared with NICE and CUCCLG results

In my submission I contrasted the results of Santos' surveys for threatened fauna species (*BC Act 2016*) over a four-year period with those from the NICE and CUCCLG 10-day survey. This clearly demonstrated that Santos' surveys were inadequate for impact assessment purposes and suggested an inappropriate and deficient sampling stratification and survey effort. It is exemplified by a comparison of the number of individuals captured at survey sites of two of the key threatened species present in the area (table below), the South-eastern Long-eared Bat and

Pilliga Mouse, both of which are also listed under the Commonwealth *EPBC Act 1999*.

	Santos		NICE&CUCCLG	
survey period	4 years (Nov. 2010-Sep. 2014)		10 days (Oct. 2011)	
threatened species	number of individuals	number of sites	number of individuals	number of sites
South-eastern Long-eared Bat	4-5	4	21	6
Pilliga Mouse	5	3	25	7

The RTS claims that “exceptional seasonal conditions following widespread rainfall and flooding in 2010/2011” were responsible for the “high capture rates” obtained by the NICE and CUCCLG surveys, but as these conditions were operating during the first half of Santos’ surveys this poses the question as to why Santos did not obtain similar results.

Apart from this failure to explain Santos’ poor results, the RTS has endeavoured to interpret the NICE and CUCCLG results as representative of a population “boom” phase in a “boom-bust” cycle. However, this characterisation is inaccurate as all the key threatened species in the Project Area apart from the Pilliga Mouse are not “boom-bust” adapted. For example, the Pale-headed Snake, Barking Owl, Koala, Eastern Pygmy-possum, Squirrel Glider and South-eastern Long-eared Bat are *K*-selected rather than *r*-selected species and do not exhibit rapid population increases during favourable conditions.

The RTS also claims that the NICE and CUCCLG results were used “to inform the field survey ... for the EIS”, but if this was the case then the failure of Santos to investigate sites where key threatened species were detected by NICE and CUCCLG cannot be explained.

However, it is doubtful that Santos did consider the NICE and CUCCLG results because in November 2013 I made a submission to the Bibblewindi Gas Exploration Pilot Expansion proposal (located within the Project Area) that stated that Santos had ignored these results, based on their environmental assessment for the proposal. This was conveyed in an address to the NSW Planning Assessment Commission at Narrabri on 19 June 2014 and was not refuted by Santos.

RTS 6.15.1 Flora and fauna baseline data – Hollow-bearing trees

Determination of locations of hollow-bearing trees used by threatened hollow-dependent vertebrates to facilitate the implementation of protection measures

The RTS claims “a detailed analysis of the total number of hollow-bearing trees in three size classes (<200 mm; 200-300 mm; and >300 mm) to be impacted by the project was undertaken” from vegetation survey plot data. Apart from this method being inadequate to obtain reliable data due to the small size of vegetation plots (20 m x 20 m), the size classes adopted did not enable identification of large diameter hollow-bearing trees (= \geq 800 mm). Large hollow-bearing trees have been shown to be a crucial resource in the Pilliga forests and woodlands, being required by a number of hollow-dependent threatened species for den, nest and roost sites. Such species include the Glossy Black-cockatoo, Barking Owl, Yellow-bellied Sheath-tailed Bat and South-eastern Long-eared Bat.

Had an analysis of the occurrence of large hollow-bearing trees been undertaken this should have allowed targeted surveys, informed by the records Santos claimed to have used, to have determined the occurrence for example of Barking Owl nest or South-eastern Long-eared Bat maternity roost sites. Such information, which should have been feasible to obtain in a four-year survey period, would have been eminently more valuable in protecting these species than a walk-through assessment under the ecological scouting framework that would probably be conducted in a single day. Detection of threatened species occupation of large hollow-bearing trees would be unlikely using the latter method and in any case their avoidance only appears to be guaranteed if this does not compromise “engineering limits for construction and operation”. Even if large trees used by threatened species are avoided, they are likely to be abandoned in the vicinity of mining operations due to the associated noise and other disturbances.

RTS 6.15.2 Flora and fauna impacts – Impact assessment

The finding that the proposal is unlikely to have a significant impact on threatened fauna

The RTS reiterates the EIS finding of no significant impact on threatened vertebrate fauna based on the erroneous or unvalidated claims of:

- i) the assumption of an insignificant development footprint relative to the overall size of the Project Area;
- ii) no fragmentation or isolation of populations;
- iii) implementation of a “field development protocol” including an “ecological scouting framework”;
- iv) progressive rehabilitation of up to half the impacted area; and
- v) proposed minimisation and mitigation measures.

The first point fails to address my concerns over the distribution of the impact of the proposal, which will occur as a network of damaging effects spread across the entire Project Area. It is misleading to characterise this impact as affecting only a small proportion of the total Project Area because it disregards cumulative edge effects and other indirect effects including siltation of waterways and facilitation of the dispersal of introduced predators and other pest species.

Conversely, the RTS also states that “indirect effects are likely to be a more significant issue” because of the “diffuse nature of the project across the landscape”, contradicting the claim that removal of only a small proportion of threatened species habitat will not result in a significant effect.

The second point ignores my concerns over the barrier effect of infrastructure corridors, which will operate as wide, permanent obstacles to movement for small terrestrial fauna species, particularly the threatened Pale-headed Snake, Eastern Pygmy-possum and Pilliga Mouse. Populations of these species will inevitably be fragmented and isolated by such barriers and co-locating linear infrastructure along existing roads and tracks is likely to exacerbate these effects by widening and consolidating the barriers. The scale of habitat removal relative to the Project Area is an irrelevant consideration with respect to small terrestrial species with relatively poor powers of dispersal.

The RTS continues to propose implementation of the field development protocol as a means of avoiding a significant effect on threatened species, but this is unacceptable as the methodology does not appear to have been independently reviewed and there is no guarantee that findings from the ecological scouting framework will be used to avoid or mitigate impacts. My concerns in relation to the uncertainty associated with this process, and the statement that avoidance and mitigation measures are only likely to be implemented “where practicable” or “where practical”, have not been addressed in the RTS.

My submission raised the concern of significant impacts from vertebrate pest species and the RTS confirms “feral” animals represent a significant threat. This impact is proposed to be reduced below the level of significance by a “nil-tenure” control program, but the resources necessary for such a program to be effective have not been detailed and again, there is no guarantee of success. Reliance on methods and programs whose effectiveness cannot be satisfactorily assured to reach a finding of no significant effect renders the finding invalid.

RTS 6.15.2 Flora and fauna impacts – Significance of Pilliga and biodiversity values

The values of the Project Area in a local, regional and national context

My submission emphasised the special significance of the Project Area as an integral part of the Pilliga block of forests and woodlands that is nationally important as a large vegetation remnant conserving irreplaceable biodiversity values in a largely cleared landscape. While the EIS presented literature reviews that discussed these values, it failed to demonstrate how they would be affected by the proposal due to an inadequate survey and impact assessment.

The literature findings were also not used to identify areas that required specific protection, and avoidance and mitigation of impacts was proposed to be achieved by an unvalidated protocol applied as development proceeded. This approach fails to take into consideration the unique biodiversity conservation values of the Pilliga such as the provision of thermal refuges to combat the effects of global warming, and neglects to demonstrate how these will be protected. Instead, the assessment of impacts and their mitigation is confined to addressing statutory requirements and relying on an assertion that the development protocol and ecological scouting framework will identify important values, enabling impacts to be avoided and mitigated through refining extraction plant design as development progresses. However, Santos' lack of success in detecting the presence of threatened vertebrate species over four years of surveys in the Project Area provides little confidence that the proposed scouting framework will be effective in avoiding impacts on significant values.

RTS 6.15.2 Flora and fauna impacts – Rehabilitation strategy

Evidence that proposed rehabilitation will be effective

In my submission I questioned the effectiveness of the proposed rehabilitation strategy as no supporting data were provided from areas previously rehabilitated following mining exploration activities. The RTS claims that rehabilitation sites have attained 72% of the condition of reference sites, although condition is not defined and again, supporting data for this contention are not provided. However, it is likely that rehabilitated habitat would take many years to reach a level of condition suitable for use by many sensitive vertebrate species and therefore its contribution to reducing the overall impact of the proposal would be considerably limited.

RTS 6.15.2 Flora and fauna impacts – Ecological monitoring

The requirement for permanent monitoring plots

The RTS claims that “biodiversity monitoring has been undertaken since 2015 at a number of exploration sites” but no data are presented to demonstrate that this monitoring has been satisfactorily undertaken such as the experimental design, the species being monitored or any outcomes from the monitoring results.

My submission commented on the lack of permanent monitoring plots to gauge the effectiveness of mitigation measures and allow for adaptive management, but the RTS reply indicates that Santos have little understanding of the concept of monitoring. Simply resurveying the locations of surveys undertaken for the EIS is unlikely to generate data useful for assessment of impacts or the effectiveness of mitigation measures as these surveys:

- i) provided little useful information on sensitive species and their habitats;
- ii) do not appear to have been repeated in intervening years to establish patterns of distribution and abundance; and
- iii) were not located or replicated for impact assessment purposes.

RTS 6.15.2 Flora and fauna impacts – Consideration of climate change in mitigation and management

Likely severe adverse impacts of climate change and the need to provide habitat refuges

The RTS states that the EIS “considered the effect of a (*sic*) highly variable climatic cycles on the Pilliga” but appears to conclude that the potentially severe effects of climate change and associated impacts, particularly cumulative impacts that are likely to be worsened by the proposal, do not warrant effective mitigation. These impacts could be alleviated by the identification and management of refuges of suitable habitat for the most sensitive species as suggested in my submission, although Santos apparently considers such a concept unworthy of discussion.



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