

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Towrie Gas Development_10km

Report created: 23/07/2021 03:50:09

[Summary](#)

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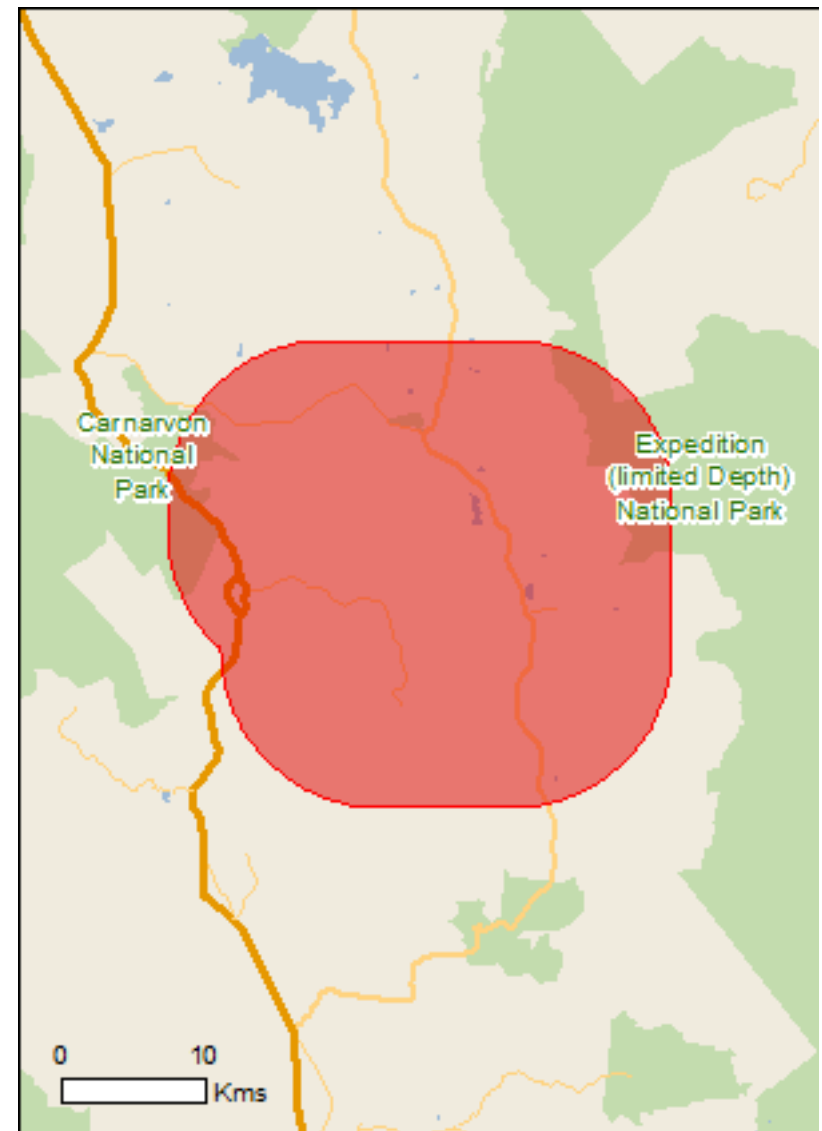
[Matters of NES](#)

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[Acknowledgements](#)



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Summary

Matters of National Environment Significance

| | |
|--|------|
| World Heritage Properties: | None |
| National Heritage Places: | None |
| Ramsar Wetlands: | None |
| Great Barrier Reef Marine Park: | None |
| Commonwealth Marine Area: | None |
| Threatened Ecological Communities: | 5 |
| Threatened Species: | 28 |
| Migratory Species: | 11 |

Other Matters Protected by the EPBC Act

| | |
|--|------|
| Commonwealth Lands: | None |
| Commonwealth Heritage Places: | None |
| Listed Marine Species: | 16 |
| Whales and Other Cetaceans: | None |
| Critical Habitats: | None |
| Commonwealth Reserves Terrestrial: | None |
| Australian Marine Parks: | None |

Extra Information

This part of the report provides information that may also be relevant to the area you have

| | |
|---|------|
| State and Territory Reserves: | 2 |
| Regional Forest Agreements: | None |
| Invasive Species: | 16 |
| Nationally Important Wetlands: | None |
| EPBC Act Referrals: | 9 |
| Key Ecological Features (Marine): | None |

Details

Matters of National Environmental Significance

Threatened Ecological Communities

[\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

| Name | Status | Type of Presence |
|--|------------|---------------------------------------|
| Brigalow (Acacia harpophylla dominant and co-dominant) | Endangered | Community known to occur within area |
| Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions | Endangered | Community may occur within area |
| Poplar Box Grassy Woodland on Alluvial Plains | Endangered | Community likely to occur within area |
| Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions | Endangered | Community likely to occur within area |
| Weeping Myall Woodlands | Endangered | Community likely to occur within area |

Threatened Species

[\[Resource Information \]](#)

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

| Current Scientific Name | Status | Type of Presence |
|---|-----------------------|--|
| BIRD | | |
| Calidris ferruginea Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Erythrorchis radiatus Red Goshawk [942] | Vulnerable | Species or species habitat likely to occur within area |

| Current Scientific Name | Status | Type of Presence |
|---|------------|--|
| LEX-26197 Falco hypoleucos Grey Falcon [929] | Vulnerable | Species or species habitat may occur within area |
| Geophaps scripta scripta Squatter Pigeon (southern) [64440] | Vulnerable | Species or species habitat known to occur within area |
| Grantiella picta Painted Honeyeater [470] | Vulnerable | Species or species habitat may occur within area |
| Hirundapus caudacutus White-throated Needletail [682] | Vulnerable | Species or species habitat may occur within area |
| Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027] | Endangered | Species or species habitat likely to occur within area |
| Rostratula australis Australian Painted Snipe [77037] | Endangered | Species or species habitat may occur within area |
| MAMMAL | | |
| Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183] | Vulnerable | Species or species habitat known to occur within area |
| Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331] | Endangered | Species or species habitat likely to occur within area |
| Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395] | Vulnerable | Species or species habitat may occur within area |
| Petauroides volans Greater Glider [254] | Vulnerable | Species or species habitat known to occur within area |
| Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104] | Vulnerable | Species or species habitat likely to occur within area |

PLANT

| Current Scientific Name | Status | Type of Presence |
|--|------------|--|
| Acacia grandifolia [3566] | Vulnerable | Species or species habitat likely to occur within area |
| Arthraxon hispidus Hairy-joint Grass [9338] | Vulnerable | Species or species habitat likely to occur within area |
| Cadellia pentastylis Ooline [9828] | Vulnerable | Species or species habitat known to occur within area |
| Dichanthium setosum bluegrass [14159] | Vulnerable | Species or species habitat likely to occur within area |
| Solanum dissectum [75720] | Endangered | Species or species habitat may occur within area |
| Solanum johnsonianum [84820] | Endangered | Species or species habitat may occur within area |
| Thesium australe Austral Toadflax, Toadflax [15202] | Vulnerable | Species or species habitat may occur within area |
| Tylophora linearis [55231] | Endangered | Species or species habitat may occur within area |
| Xerothamnella herbacea [4146] | Endangered | Species or species habitat likely to occur within area |
| REPTILE | | |
| Delma torquata Adorned Delma, Collared Delma [1656] | Vulnerable | Species or species habitat may occur within area |
| Denisonia maculata Ornamental Snake [1193] | Vulnerable | Species or species habitat may occur within area |

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| Current Scientific Name | Status | Type of Presence |
|--|-----------------------|--|
| Egernia rugosa Yakka Skink [1420] | Vulnerable | Species or species habitat known to occur within area |
| Elseya albagula Southern Snapping Turtle, White-throated Snapping Turtle [81648] | Critically Endangered | Species or species habitat likely to occur within area |
| Furina dunmalli Dunmall's Snake [59254] | Vulnerable | Species or species habitat may occur within area |
| Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761] | Vulnerable | Species or species habitat likely to occur within area |

Migratory Species [[Resource Information](#)]

| Current Scientific Name | Threatened | Type of Presence |
|---|------------|--|
| Migratory Marine Birds | | |
| Apus pacificus Fork-tailed Swift [678] | | Species or species habitat likely to occur within area |

Migratory Terrestrial Species

| | | |
|--|------------|--|
| Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651] | | Species or species habitat may occur within area |
| Hirundapus caudacutus White-throated Needletail [682] | Vulnerable | Species or species habitat may occur within area |
| Motacilla flava Yellow Wagtail [644] | | Species or species habitat may occur within area |
| Myiagra cyanoleuca Satin Flycatcher [612] | | Species or species habitat likely to occur within area |
| Rhipidura rufifrons Rufous Fantail [592] | | Species or species habitat may occur within area |

Migratory Wetlands Species

| Current Scientific Name | Threatened | Type of Presence |
|--|-----------------------|--|
| Actitis hypoleucos Common Sandpiper [59309] | DOCUMENT 1 | Species or species habitat may occur within area |
| Calidris acuminata Sharp-tailed Sandpiper [874] | | Species or species habitat may occur within area |
| Calidris ferruginea Curlew Sandpiper [856] | Critically Endangered | Species or species habitat may occur within area |
| Calidris melanotos Pectoral Sandpiper [858] | | Species or species habitat may occur within area |
| Gallinago hardwickii Latham's Snipe, Japanese Snipe [863] | | Species or species habitat may occur within area |

Other Matters Protected by the EPBC Act

| Listed Marine Species | Threatened | [Resource Information] |
|---|------------|---|
| Current Scientific Name | Threatened | Type of Presence |
| Bird | | |
| Actitis hypoleucos Common Sandpiper [59309] | | Species or species habitat may occur within area |
| Anseranas semipalmata Magpie Goose [978] | | Species or species habitat may occur within area overfly marine area |
| Apus pacificus Fork-tailed Swift [678] | | Species or species habitat likely to occur within area overfly marine area |
| Bubulcus ibis as Ardea ibis Cattle Egret [66521] | | Species or species habitat may occur within area overfly marine area |

| Current Scientific Name | Threatened | Type of Presence |
|---|-----------------------|--|
| <p>LEX-26197</p> <p>Calidris acuminata Sharp-tailed Sandpiper [874]</p> | DOCUMENT 1 | Page 8 of 45 Species or species habitat may occur within area |
| <p>Calidris ferruginea Curlew Sandpiper [856]</p> | Critically Endangered | Species or species habitat may occur within area overfly marine area |
| <p>Calidris melanotos Pectoral Sandpiper [858]</p> | | Species or species habitat may occur within area overfly marine area |
| <p>Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]</p> | | Species or species habitat likely to occur within area overfly marine area |
| <p>Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]</p> | | Species or species habitat may occur within area overfly marine area |
| <p>Haliaeetus leucogaster White-bellied Sea-Eagle [943]</p> | | Species or species habitat likely to occur within area |
| <p>Hirundapus caudacutus White-throated Needletail [682]</p> | Vulnerable | Species or species habitat may occur within area overfly marine area |
| <p>Merops ornatus Rainbow Bee-eater [670]</p> | | Species or species habitat may occur within area overfly marine area |
| <p>Motacilla flava Yellow Wagtail [644]</p> | | Species or species habitat may occur within area overfly marine area |
| <p>Myiagra cyanoleuca Satin Flycatcher [612]</p> | | Species or species habitat likely to occur within area overfly marine area |
| <p>Rhipidura rufifrons Rufous Fantail [592]</p> | | Species or species habitat may occur within area overfly marine area |

| Current Scientific Name | Threatened | Type of Presence |
|---|--------------------------|--|
| LEX-26197 Rostratula australis as Rostratula benghalensis (sensu lato) | DOCUMENT 1 Endangered | Page 9 of 45 Species or species habitat may occur within area overfly marine area |
| Australian Painted Snipe [77037] | | |

Extra Information

| State and Territory Reserves | [Resource Information] |
|--|--------------------------|
| Name | State |
| Carnarvon National Park | QLD |
| Expedition (Limited Depth) National Park | QLD |

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit,

| Name | Status | Type of Presence |
|---|--------|--|
| Bird | | |
| Passer domesticus | | |
| House Sparrow [405] | Feral | Species or species habitat likely to occur within area |
| Sturnus vulgaris | | |
| Common Starling [389] | Feral | Species or species habitat likely to occur within area |
| Frog | | |
| Rhinella marina | | |
| Cane Toad [83218] | Feral | Species or species habitat known to occur within area |
| Mammal | | |
| Canis familiaris listed as Canis lupus familiaris | | |
| Domestic Dog, Dingo [17] | Feral | Species or species habitat likely to occur within area |

| Name | Status | Type of Presence |
|--|------------|--|
| <p>LEX-26197 Equus caballus</p> | DOCUMENT 1 | Page 10 of 45 |
| <p>Horse [5]</p> | Feral | Species or species habitat likely to occur within area |
| <p>Felis catus</p> | | |
| <p>Cat, House Cat, Domestic Cat [19]</p> | Feral | Species or species habitat likely to occur within area |
| <p>Mus musculus</p> | | |
| <p>House Mouse [120]</p> | Feral | Species or species habitat likely to occur within area |
| <p>Oryctolagus cuniculus</p> | | |
| <p>Rabbit, European Rabbit [128]</p> | Feral | Species or species habitat likely to occur within area |
| <p>Sus scrofa</p> | | |
| <p>Pig [6]</p> | Feral | Species or species habitat likely to occur within area |
| <p>Vulpes vulpes</p> | | |
| <p>Red Fox, Fox [18]</p> | Feral | Species or species habitat likely to occur within area |
| Plant | | |
| <p>Cryptostegia grandiflora</p> | | |
| <p>Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913]</p> | WoNS | Species or species habitat likely to occur within area |
| <p>Opuntia spp.</p> | | |
| <p>Prickly Pears [82753]</p> | WoNS | Species or species habitat likely to occur within area |
| <p>Parkinsonia aculeata</p> | | |
| <p>Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]</p> | WoNS | Species or species habitat likely to occur within area |
| <p>Parthenium hysterophorus</p> | | |
| <p>Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]</p> | WoNS | Species or species habitat likely to occur within area |
| <p>Solanum elaeagnifolium</p> | | |
| <p>Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]</p> | WoNS | Species or species habitat likely to occur within area |

| Name | Status | Type of Presence |
|--|--------------------|---|
| LEX-26197 Vachellia nilotica | DOCUMENT 1 WoNS | Page 11 of 45 Species or species habitat likely to occur within area |
| Prickly Acacia, Blackthorn, Prickly Mimosa, Black Piquant, Babul [84351] | | |

EPBC Act Referrals [\[Resource Information \]](#)

Further details about the referral is available in the Environmental Impact Assessment System (EIAS); click on the title to access.

| Referral | | | |
|--|-----------|-----------------------|----------------------|
| Title | Reference | Referral Outcome | Assessment Status |
| Coal Seam Gas Field Development for Natural Gas Liquefaction Park, Curtis Island | 2008/4059 | Controlled Action | Completed |
| Gas Pipeline with Alternative Pipeline to Supply Natural Gas Liquefaction Park | 2008/4096 | Controlled Action | Post-Approval |
| Gas Supply Security Project | 2020/8856 | Controlled Action | Guidelines Issued |
| Gas Transmission Pipeline to supply Natural Gas Liquefaction Park | 2008/4061 | Referral Decision | Completed |
| Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia | 2015/7522 | Not Controlled Action | Completed |
| Repair, reconstruction & rehabilitation of Carnarvon & Dawson Highways, QLD | 2012/6485 | Not Controlled Action | Completed |
| Santos GLNG Gas Field Development Project, QLD | 2012/6615 | Controlled Action | Post-Approval |
| Towrie Gas Development | 2020/8851 | Controlled Action | Completed |
| Towrie Gas Development PL 1059 | 2021/8979 | Referral Decision | Referral Publication |

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment, Energy and Science, New South Wales](#)
- [-Department of Environment, Land, Water and Planning, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Government of South Australia, Department for Environment and Water, South Australia](#)
- [-Department of Environment and Natural Resources, Northern Territory](#)
- [-Department of Environment and Science, Queensland](#)
- [-Department of Biodiversity, Conservation and Attractions, Western Australia](#)
- [-Environment, Planning and Sustainable Development Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Department of Environment and Energy, Australian Bird and Bat Banding Scheme](#)
- [-CSIRO, Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Australian Museum](#)
- [-Museums Victoria](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [-Forestry Corporation of NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

**OFFICE OF WATER SCIENCE ADVICE
TOWRIE GAS DEVELOPMENT, 50 KM NORTH OF INJUNE, SURAT BASIN, CENTRAL
QUEENSLAND**

| | | | |
|---------------------------------|---|---------------------------|-----------------|
| Requesting section | Queensland Assessments North | Requesting officer | s. 22(1)(a)(ii) |
| Date of request | 29/06/2021 | | |
| EPBC reference | EPBC 2021/8979 | OWS reference | OWS 2021-048 |
| Project assessment stage | Referral | | |
| OWS contact officer | s. 22(1)(a)(ii) | | |
| Cleared by | s. 22(1)(a)(ii) Director / Senior Principal Research Scientist | Date of Advice | 13/07/2021 |

The OWS provides technical advice for internal Departmental decision making and briefing purposes only. OWS advice should not be forwarded directly to external parties in the format provided. Please contact the OWS before providing the advice directly to an external source. The OWS does not speak for, and our response has not been endorsed by, the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development.

This document, prepared at the request of the Environmental Assessments Division, outlines the Office of Water Science's (OWS) technical advice on Santos' Towrie Gas project.

The project is located approximately 50 km north of the township of Injune. The gas target for the project is within the Bandanna Formation, part of the Permo-Triassic Bowen Basin. The proposed project area is located within the Comet River catchment (part of the Fitzroy Basin), bounded by Expedition and Shotover Ranges in the east, the Carnarvon Range in the south and the Buckland Tableland in the west. Most watercourses are ephemeral and typically flow during and immediately after rainfall events. Key watercourses include Spring Creek, Arcadia Creek and Station Creek. Each of these watercourse's merge to join the Brown River which subsequently becomes the Comet River. The project area includes lacustrine, riverine and minor palustrine wetlands, with the nearest wetland, lake Nuga Nuga, an inland seasonal and intermittent freshwater floodplain located approximately 25 km north of the project area. The nearest spring complex is located approximately 6 km northwest of the proposed project.

The project, which covers 8,678 ha, is expected to commence in mid-2022 and operate for approximately 30 years, will involve the progressive development of gas infrastructure including:

- up to 116 gas production wells;
- ancillary linear infrastructure including gas and water pipelines, access tracks, power lines, and communication lines;

- a camp site with a treated effluent irrigation area;
- water management infrastructure; and
- other ancillary activities and facilities to support gas field development.

Total groundwater abstraction over the duration of the project is estimated to be approximately 2.3 GL, peaking in 2029 at a rate of approximately 2.2 ML/day.

Q1. What does the OWS consider are the likely nature and extent of impacts on water resources as a result of the proposed action?

Groundwater

1. The magnitude and extent of impacts on water resources as a result of the proposed project are largely determined by groundwater drawdown predictions. As the groundwater model for this EPBC referral (2021/8979) has not changed since the previous referral (2020/8851), the limitations of the model, as previously discussed in OWS 2020-075, remain identical. OWS reiterates the following key points from the previous advice.
 - a. The groundwater model uses the median hydraulic parameter values for the hydrogeological units in this area. However, the results from drilling may indicate that different hydraulic parameters should be used which would likely change the predicted drawdown ranges and extents. Furthermore, although the Rewan Group is described by KCB as an aquitard which will not impact potential terrestrial GDEs, drawdown of up to 1 m is predicted (KCB 2021, p. 108). The proponent should validate the calibrated hydraulic parameters used in the OGIA groundwater model prior to the commencement of the commercial extraction of gas.
 - i. Should local-scale data indicate that hydraulic parameters are outside the calibrated values of the OGIA model, predicted drawdowns using the OGIA groundwater model should be re-run using this new local-scale data.
 - b. Given the presence of potential GDEs both within and adjacent to the proposed project area (Paragraph 2), the proponent should develop an ecohydrological conceptual model (contingent on the results of a GDE assessment (Paragraph 2ai)) which outlines the potential hydrogeological connectivity and impact pathways between drawdown within the Rewan Group, alluvium and potential GDEs. This ecohydrological model should also include spring complexes including those identified 10 to 25 km to the west of the Towrie Development Area associated with the Clematis Group and Precipice Sandstone (KCB 2021, p. 84).
 - i. Should these potential GDEs be confirmed as groundwater dependent (Paragraph 2ai), the ecohydrological conceptual model could be used to inform the locations and screening depths of additional monitoring bores which should be located near these potential GDEs.

Water-dependent ecosystems

2. Within the is northeast corner of the project area there is low potential for GDEs (along Arcadia Creek and Station Creek), characterised by corridors of Brigalow (*Acacia harpophylla*) and Poplar Box (*Eucalyptus populnea*). These corridors of Brigalow provide potential habitat for up to 14 EPBC-listed species, including the Ornamental snake

(*Denisonia maculate*), Large eared pied bat (*Chalinolobus dwyeri*), Koala (*Phascolarctos cinereus*), and Painted honey eater (*Grantiella picta*) (AECOM 2021, pp. 100-115). Furthermore, there is moderate potential for GDEs outside and adjacent to the western edge of the project area. Additionally, areas of non-remnant Gilgai within the project area (approximately 132 ha in total) were identified by AECOM, which may provide habitat for the EPBC-listed Ornamental snake (*Denisonia maculate*) and the Australian painted snipe (*Rostratula australis*) (AECOM 2021, Table 11, p. 58).

- a. Although drawdown within the alluvium is not predicted (at the 95th percentile) as a result of the proposed project, potential GDEs have been mapped within the vicinity of the project by the Queensland DES (KCB 2021, Figure 7.26, p. 88). Furthermore, should local scale data indicate that hydraulic parameters are outside the calibrated values of the OGIA model, drawdown within the alluvium may be systematically underpredicted (Paragraph 1a). In accordance with the 'Coal Seam Gas – Joint Industry Framework' (JIF) (2021), the risk of the proposed project on these potential GDEs may subsequently increase from low to high, and would trigger a site-specific assessment, including the development of performance criteria, trigger values and limits for these potential GDEs (JIF 2021, Table 1, p. 16).
 - i. While not required under the JIF at present, as a precautionary measure, it would be prudent for the proponent to assess groundwater dependency of riparian vegetation, including Gilgai and Brigalow (*Acacia harpophylla*) on alluvial sediments by using direct techniques (e.g., stable isotopes, leaf water potential and soil water potential) as described in Doody *et al.* (2019) and Jones *et al.* (2019). Should this assessment confirm the presence of groundwater dependent vegetation combined with changes in the groundwater drawdown predictions, the proponent should develop an ecohydrological conceptual model to delineate and assess the potential impact pathways of potential groundwater drawdown on these GDE's. A GDE management plan, which could be informed by this ecohydrological conceptual model, should also be developed. The management plan should outline the mitigation and monitoring measures used to protect the ecological values of these GDEs.
 - ii. Should groundwater drawdown in the outcropping Clematis Group, Rewan Group and Quaternary alluvium occur as a result of the project, flows within Spring Creek, Arcadia Creek, Station Creek, Brown River, its tributaries and the major wetland on site may be impacted. Furthermore, the persistence of ecologically important stream pools may be impacted. The Australian painted snipe (*Rostratula australis*) and Ornamental snake (*Denisonia maculate*) may utilize this habitat and may be impacted should there be a material change in the persistence of these pools. Similarly, the EPBC-listed endangered Northern Quoll (*Dasyurus hallucatus*), may also be impacted should the project result in increased runoff or ponding which may encourage the proliferation of cane toads. These potential impact pathways should be considered in the ecohydrological model.
3. Modified wetlands were identified in scattered locations over the proposed project area and are dominated by exotic species and highly disturbed by cattle (AECOM 2021, pp. 72-73). A wetland, approximately 1.5 km long by 1 km wide, located adjacent to the public reserve within the northeast portion of the proposed project is highlighted as important habitat for a

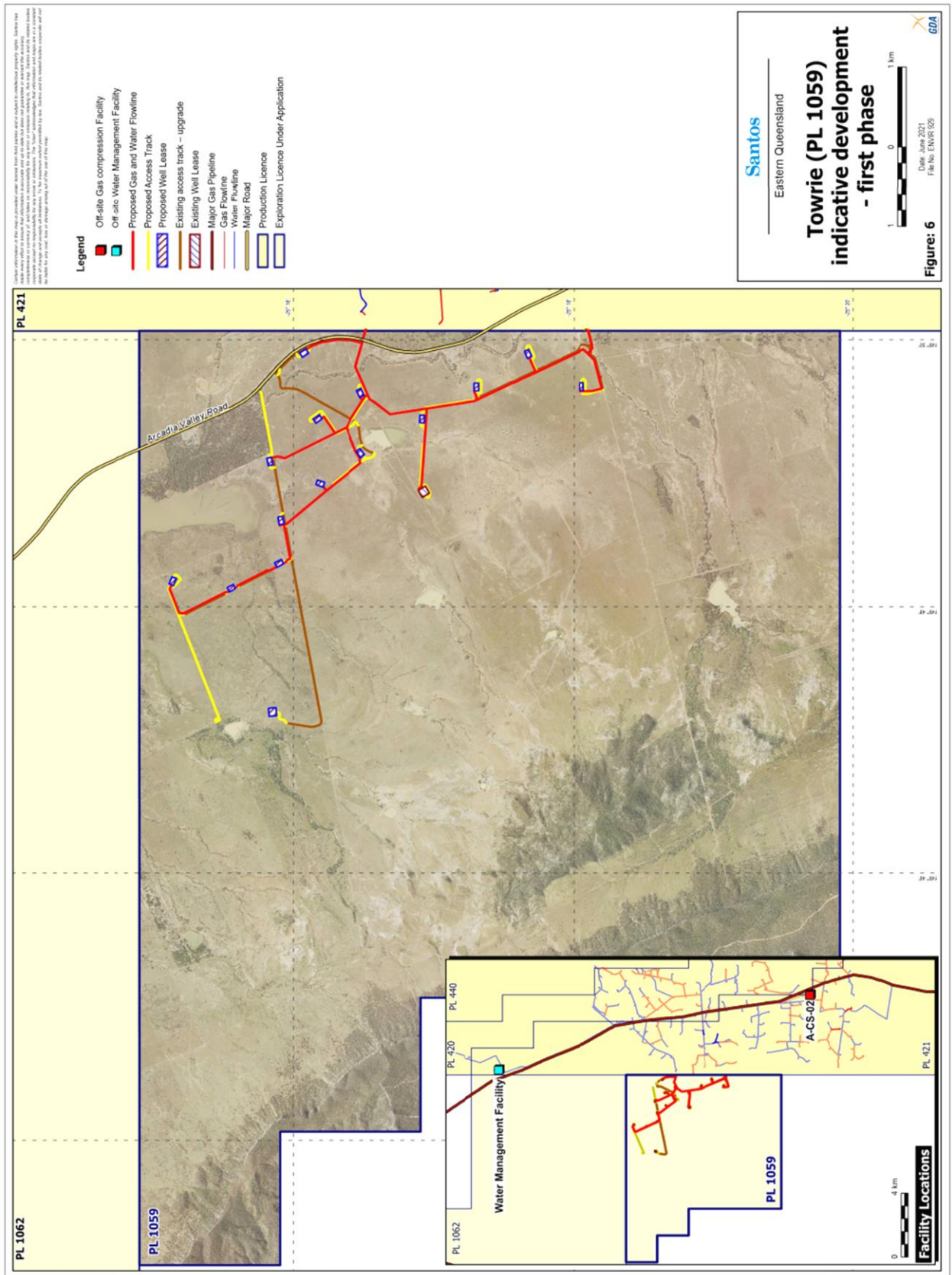
suite of EPBC-listed species (Paragraph 2). The modified wetland is a confluence of several watercourses, including Station Creek, which is noted to be in moderate condition (AECOM 2021, p. 53,73). Furthermore, although the western edge of the modified wetland has been historically cleared, the proponent states this area is *“likely to provide ideal foraging conditions for wetland birds including the EPBC Act listed endangered Australian painted snipe and migratory Latham’s snipe”* (AECOM 2021, p. 66)

- a. The proposed tracks, gas and water flow lines cross these water courses and are provided in Attachment A. Although these water courses are ephemeral, they form part of the catchment for the wetland. Should these watercourses be modified or disturbed, the timing, duration, magnitude, and frequency of flows into the wetland may be materially changed. The proponent also notes that the *“narrow riparian vegetation associated with the mapped watercourses (especially the unnamed tributary of Station Creek) provide the only movement opportunities for fauna across the landscape and are therefore highly important”* (AECOM 2021, p. 72). The proponent also notes that although the riparian vegetation is highly disturbed it can provide connection to higher quality habitat such as the wetland and brigalow in the public reserve (AECOM 2021, p. 72). To ensure that these riparian corridors are appropriately protected, the proponent should clarify the design of this infrastructure, noting that the movement of aquatic and terrestrial biota along these riparian corridors should be maintained.
4. The proponent states there is unlikely to be stygofauna present in the targeted coal seams due to the depth (greater than 100 m below ground level) and EC levels of the groundwater within the coal seams (KCB 2021, p. 90). However, stygofauna may be present within the alluvium. Sampling of stygofauna within the alluvium should be undertaken in accordance with the Department of Science, Information Technology and Innovation (DSITI) guidelines, which recommends that a pilot study be undertaken which includes collecting samples from ten representative bores (DSITI 2015, pp. 1–2).

Surface water

5. The proponent has provided flood modelling maps for a flood extent for 1% Annual Exceedance Probability (AEP) (KCB 2021, p. 45). The mapping indicates that for a 1 in 100-year flood event, flooding may occur within the Brown River as well as Arcadia Creek, Moolayember Creek and Station Creek (KCB 2021, p. 44). According to the indicative development plan (Attachment A) at least one proposed well lease is within the flood prediction area. Additionally, Arcadia Valley Road and many of the access roads fall within this flood zone. The proponent should clarify how potential impacts to project infrastructure, including well pads and storage tanks caused by a 1% AEP flood event, will be mitigated and managed.
6. Produced water from the Towrie Development Area (PL 1059) is planned to be transferred to neighbouring (adjacent to PL 1059) water management facilities owned and operated by Santos. The proponent notes that site water balances have been undertaken for all project phases at these water management facilities to ensure adequate storage and treatment capacity is available (KCB 2021, p. 26). However, as OWS has not been provided with these water balances, their adequacy and plausibility cannot be assessed.

Attachment A



Water Assessment Information Portal (WAIP): for more information on water-related environmental impacts, please see the WAIP (accessible on the intranet via Home ⇒ Themes ⇒ Water ⇒ Water Assessment Information Portal).

References

AECOM 2021. *Matters of National Environmental Significance – Ecology Assessment -Towrie Development*. July 2021.

Coal Seam Gas - Joint industry framework. *Managing impacts to groundwater resources in the Surat Cumulative Management Area under EPBC Act approvals*. 17 March 2021.

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Doody TM, Hancock PJ, and Pritchard JL, 2019. *Information Guidelines Explanatory Note: Assessing groundwater-dependent ecosystems. Report prepared for the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development through the Department of the Environment and Energy, Commonwealth of Australia 2019*. Available [online]. <http://www.iesc.environment.gov.au/system/files/resources/422b5f66-dfba-4e89-adda-b169fe408fe1/files/information-guidelines-explanatory-note-assessing-groundwater-dependent-ecosystems.pdf>. Accessed July 2021.

Jones C, Stanton D, Hamer N, Denner S, Singh K, Flook S, and Dyring M, 2019. *Field investigations of potential terrestrial groundwater dependent ecosystems within Australia's Great Artesian Basin*. *Hydrogeology Journal*, 28, 237–261.

Klohn Crippen Berger (KCB) 2021. *Santos CSG Pty Ltd – Towrie Development Area, Water Assessment Report*. May 2021.



s. 22(1)(a)(ii)

Director
Environment Queensland (North)
Environment Assessments Queensland and Sea Dumping
Department of Agriculture, Water and the Environment
GPO Box 858
CANBERRA ACT 2601

Dear s. 22(1)(a)(ii)

I refer to the letter of 29 June 2021 from s. 22(1)(a)(ii) (Director, Referrals Gateway, Department of Agriculture, Water and the Environment) to the Hon. David Littleproud MP, Minister for Agriculture and Northern Australia, inviting comment on referral 2021/8979 Towrie Gas Development PL 1059, Queensland, under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Minister has asked me to reply on his behalf.

I have no comments from an agricultural perspective on whether the proposed action may have significant impact(s) on any matters of national environmental significance protected under the EPBC Act.

It is noted that this referral relates to Santos CSG Pty Ltd.'s proposal to develop up to 116 new coal seam gas wells and associated infrastructure 50 kilometres north of Injune. Construction of surface infrastructure will occur over 867 hectares predominantly used for cattle grazing.

Thank you for the opportunity to comment on referral EPBC 2021/8979.

Yours sincerely

S. 47F(1)

Anthony Bennie
Assistant Secretary
Climate Adaptation & Resilience Division

13 July 2021

s. 22(1)(a)(ii)

From: s. 22(1)(a)(ii)
Sent: Thursday, 15 July 2021 9:04 AM
To: s. 22(1)(a)(ii)
Cc: s. 22(1)(a)(ii) s. 22(1)(a)(ii)
Subject: FW: EPBC 2021/8979 Towrie Gas Development PL 1059 QLD [SEC=OFFICIAL]

Follow Up Flag: Follow up
Flag Status: Flagged

And one more!

From: s. 22(1)(a)(ii)
Sent: Wednesday, 14 July 2021 6:35 PM
To: s. 22(1)(a)(ii)
Cc: s. 22(1)(a)(ii)
Subject: FW: EPBC 2021/8979 Towrie Gas Development PL 1059 QLD [SEC=OFFICIAL]

From: s. 47F(1)
Sent: Tuesday, 13 July 2021 5:32 PM
To: s. 22(1)(a)(ii)
Cc: Environment Policy <EnvironmentPolicy@niaa.gov.au>; s. 47F(1)
Subject: EPBC 2021/8979 Towrie Gas Development PL 1059 QLD [SEC=OFFICIAL]

OFFICIAL

s. 22(1)(a)(ii)
Director
Environment Queensland (North)
Environment Assessments Queensland and Sea Dumping
Department of Agriculture Water and the Environment
s. 22(1)(a)(ii)

Dear s. 22(1)(a)(ii)

Thank you for the email of 29 June 2021 inviting comments on the referral for Santos CSG Pty Ltd to develop up to 116 new coal seam gas (CSG) wells and associated infrastructure, in Arcadia Valley within the Surat Basin, Queensland (EPBC 2021/8979).

We understand that there are various native title determinations and Indigenous Land Use Agreements (ILUA) formed between the proponent and traditional owners of the project area. While the project area will predominantly cover freehold land, given the complex nature of the determinations, it is recommended that relevant parties seek advice as to whether the future acts regime of the *Native Title Act 1993* applies to the adjoining tenure that is not freehold.

We note the referral indicates that the proponent has negotiated a Cultural Heritage Management Plan (CHMP) with traditional owners for the project area and adjoining tenure. Given the confidential nature of the CHMP, we cannot confirm whether all relevant traditional owners have been included in this process. The referral also indicates that three registered Aboriginal heritage sites have been identified within the project area. The proponent is aware of these sites and has confirmed that the proposed action will not impact those areas.

We encourage the proponent to continue to engage with all relevant traditional owners including the Brown River, Karingbal and Bidjara Peoples to ensure the ongoing protection and management of all cultural heritage values and culturally significant species throughout the life of the project. The traditional owners can be contacted through Queensland South Native Title Services, the native title representative body for the region.

The National Indigenous Australians Agency also encourages the engagement of Indigenous employees and businesses. Santos CSG Pty Ltd should consider engaging with Supply Nation, which maintains a free online directory that can be used to identify suitable Indigenous business to support activities under this project. Likewise, it may be useful to contact local Job active providers, Vocational Training and Employment Centres and other employment services to connect with Indigenous jobseekers as part of this project.

If you require any further information please contact me.

Yours sincerely

s. 47F(1)

Branch Manager
Land Policy and Environment
National Indigenous Australians Agency

13 July 2021

IMPORTANT: This message, and any attachments to it, contains information that is confidential and may also be the subject of legal professional or other privilege. If you are not the intended recipient of this message, you must not review, copy, disseminate or disclose its contents to any other party or take action in reliance of any material contained within it. If you have received this message in error, please notify the sender immediately by return email informing them of the mistake and delete all copies of the message from your computer system.

s. 22(1)(a)(ii)

From: s. 22(1)(a)(ii)
Sent: Thursday, 15 July 2021 9:04 AM
To: s. 22(1)(a)(ii)
Cc: s. 22(1)(a)(ii)
Subject: FW: Invitation to comment on Referral – Resources (EPBC 2021/8979) Towrie Gas Development PL 1059, QLD [SEC=OFFICIAL]
Attachments: GA comment on EPBC 2021_8979 Towrie Gas Development.pdf
Follow Up Flag: Follow up
Flag Status: Flagged

Hey ^{s. 22(1)(a)(ii)}

Another one for Towrie.

^{s. 22(1)(a)(ii)}

From: s. 22(1)(a)(ii)
Sent: Wednesday, 14 July 2021 6:34 PM
To: s. 22(1)(a)(ii)
Cc: s. 22(1)(a)(ii)
Subject: FW: Invitation to comment on Referral – Resources (EPBC 2021/8979) Towrie Gas Development PL 1059, QLD [SEC=OFFICIAL]

From: EPBC <EPBC@industry.gov.au>
Sent: Tuesday, 13 July 2021 5:32 PM
To: s. 22(1)(a)(ii)
Cc: EPBC <EPBC@industry.gov.au>
Subject: FW: Invitation to comment on Referral – Resources (EPBC 2021/8979) Towrie Gas Development PL 1059, QLD [SEC=OFFICIAL]

Dear ^{s. 22(1)(a)(ii)},

Geoscience Australia has reviewed the updated documents relating to the referral on *EPBC 2021/8979 Towrie Gas Development PL 1059, QLD*. Please find attached their technical commentary.

Kind Regards,

s. 47F(1)

OFFICIAL

From: EPBC Referrals [<mailto:EPBC.Referrals@awe.gov.au>]
Sent: Tuesday, 29 June 2021 2:31 PM
To: EPBC <EPBC@industry.gov.au>
Cc: epbc@ga.gov.au
Subject: Invitation to comment on Referral – Resources (EPBC 2021/8979) Towrie Gas Development PL 1059, QLD [SEC=OFFICIAL]

The Hon Keith Pitt MP
Minister for Resources, Water and Northern
Australia
Parliament House
CANBERRA ACT 2600

Date: 29 June 2021
EPBC Ref: 2021/8979
EPBC contact: s. 22(1)(a)(ii)

Dear Minister

**Invitation to comment on referral
Towrie Gas Development PL 1059, Arcadia Valley within the Surat Basin, QLD**

The Department of Agriculture, Water and the Environment (the Department) has received a referral of a proposed action from Santos CSG Pty Ltd to develop new coal seam gas (CSG) wells and associated infrastructure, Arcadia Valley within the Surat Basin, Queensland, for consideration under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Department is currently undertaking an assessment to decide whether this proposed action requires approval under the EPBC Act before it can proceed. The referral may be viewed or copied from the Department's website, www.environment.gov.au/epbc.

I am writing to invite you to provide any relevant information as to whether you consider the proposed action is likely to have a significant impact on any of the matters protected under the EPBC Act.

In accordance with the EPBC Act, we need to receive your response by **13 July 2021** Please quote the title of the action and EPBC reference, as shown at the beginning of this letter, in any correspondence. You can send information to the Department:

by letter **s. 22(1)(a)(ii)**
Director
Environment Queensland (North)
Environment Assessments Queensland and Sea Dumping
Department of Agriculture, Water and the Environment
GPO Box 858
CANBERRA ACT 2601

by email **s. 22(1)(a)(ii)**

If you have any questions about this process, please contact **s. 22(1)(a)(ii)** and quote EPBC 2021/8979.

For your information, the Department has published an *Environmental Impact Assessment Client Service Charter* (the Charter) which outlines its commitments when undertaking environmental impact assessments under the EPBC Act. A copy of the Charter can be found at:
<https://www.awe.gov.au/about/commitment/client-service-charter>.

Yours sincerely

s. 22(1)(a)(ii)

Director
Referrals Gateway



**Environment and Resource Stewardship
Resource Strategy Branch
Resources Division
Department of Industry, Science, Energy and Resources**

Cnr Jerrabomberra Avenue
and Hindmarsh Drive,
Symonston ACT 2609
GPO Box 378,
Canberra, ACT 2601 Australia
Phone: +61 2 6249 9111
Facsimile: +61 2 6249 9999
Web: www.ga.gov.au
ABN 80 091 799 039

8 July 2021

Attn: s. 22(1)(a)(ii)

Re: Invitation to comment on referral (EPBC 2021/8979) – Towrie Gas Development PL 1059, Arcadia Valley within the Surat Basin, QLD

I refer to the request for comments dated 29 June 2021 on an EPBC referral for the Towrie Gas Development on Petroleum Lease 1059 (the Project), Towrie, QLD, by Santos CSG Pty Ltd (the Proponent). The Project is in a joint venture on behalf of Australia Pacific LNG (CSG) Pty Limited, PAPT (Upstream) Pty Limited, Total E&P Australia III and KGLNG E&P Pty Ltd. Geoscience Australia (GA) has reviewed the referral information, particularly as it relates to sections 24D and 24E (the water trigger) of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), with attention to potential impacts to groundwater resources and other technical geoscience or geotechnical factors. Geoscience Australia notes our comments on the earlier, now withdrawn, EPBC referral 2020/8851 for a very similar proposed project. We note the increase in the total number of wells to 116 and the change to managing produced water to use storage tanks only to mitigate the potential for uncontrolled releases during high rainfall events.

Background

The Towrie Gas Development Project is located 350 km southwest of Gladstone, 50 km north of Injune, in central southern Queensland. The Project proposes to extract coal seam gas (CSG) from the target Bandanna Formation coal seams in the Bowen Basin over an area of approximately 8,678 hectares within Petroleum Lease (PL) 1059. The Project area has reported 2P CSG reserves of 16.2 petajoules as at end 2019 (Queensland Department of Natural Resources, Mines and Energy, 2020). The Project adjoins the Arcadia CSG field, which produced 7.6 petajoules of gas in 2019 as part of the Gladstone Liquefied Natural Gas (GLNG) and Gas Field Development (GFD) projects (Queensland Department of Natural Resources, Mines and Energy, 2020).

The proposed action involves construction, operation, decommissioning and rehabilitation of up to 116 new vertical gas wells and supporting infrastructure. Hydraulic fracture stimulation will be used to complete the wells. The project will supply natural gas to commercial markets through existing infrastructure developed as part of the GLNG and GFD projects, including transferring gas by pipeline to the Arcadia gas compression facility for processing to a commercial quality. The final configuration and location of gas field infrastructure will be determined by ongoing resource exploration and field development planning.

While the proposed action is not part of a staged development or larger action, it is related to other actions in the region. The proposed action is part of the broader development of CSG resources by the Proponent and other developers. It is referred as a separate action as it does not fall under earlier

EPBC Act assessments and approvals for the GLNG (EPBC 2008/4059) and GFD projects (EPBC 2012/6615) approved by the Commonwealth. For commercial reasons, and in discussion with the Department of Agriculture, Water and the Environment, additional development blocks adjacent to and utilising infrastructure from this action and the GLNG and GFD projects will be referred separately. Additional piecemeal referrals from other developers are anticipated in the future.

The Proponent has assessed that the Project is unlikely to have a significant impact on water resources under the EPBC Act Water Trigger. This is based on Queensland Government numerical modelling and desktop assessment of the potential impacts of the Project on its own.

Comment

As noted in our previous commentary, the groundwater assessment only considers impacts arising directly from the action and does not include an assessment of cumulative impacts from the regional modelling conducted by the Queensland Office of Groundwater Impact Assessment (OGIA). The proponent has rationalised the decision to not consider cumulative impact from coal mines with a statement in Section 4.2 Impact Assessment, p32 Attachment D, Water Assessment Report, May 2021. The assessment relies on regional-scale groundwater modelling undertaken by the OGIA and desktop reviews of spring and groundwater dependent ecosystem data. The uncertainty assessment presented in appendix V of Attachment D - KCB, May 2021 show maximum predicted drawdown uncertainties. These are derived from the OGIA modelling and appear to not detail the cumulative impact contributions to maximum predicted drawdown from adjacent developments. It is unclear why this available information is not part of the impact assessment.

The proponent's Water Assessment Report (Attachment D - KCB, May 2021) now references the OGIA Underground Water Impact Report (UWIR) for the Surat Cumulative Management Area (OGIA, July 2019). It is unclear if the proponent has considered the implications of UWIR Section 6.5.8 *Model complexity, assumptions and limitations* (OGIA, July 2019, p92) and the statement regarding local scale geological complexity and "...variations in predictions at sub-cell scale cannot be derived from the [regional] model."

Based on the information provided in the referral and considering the precautionary principle, it is not possible to rule out the potential for direct or cumulative impacts to water resources to be significant at the local scale. The Proponent should undertake a more detailed significance assessment to ensure the regional modelling and desktop studies by OGIA have adequately accounted for potential local-scale or operational variability and provide assurance that commercial and regulatory decisions are based on an appropriate degree of risk management.

If you have any queries on this, please contact me on [s. 47F\(1\)](#)

Kind regards,

s. 47F(1)

A/g Director - Groundwater Advice and Data,
Advice, Investment Attraction and Analysis Branch,
Minerals, Energy and Groundwater Division
Geoscience Australia



Ref 101/0003868

Department of
Environment and Science

14 July 2021

s. 22(1)(a)(ii)

Director
Environment Queensland (North)
Environment Assessments Queensland and Sea Dumping
Department of Agriculture, Water and the Environment
GPO Box 858
CANBERRA ACT 2601

Dear **s. 22(1)(a)(ii)**

Invitation to comment on referral – Towrie Gas Development PL 1059, QLD (EPBC 2021/8979)

Thank you for your department's email dated 29 June 2021 requesting advice on whether the above action will be assessed in a manner described in Schedule 1 of the Agreement between the Commonwealth of Australia and the State of Queensland (the Bilateral Agreement) developed under Section 45 of the *Environment Protection and Biodiversity Conservation Act 1999*.

I advise the proposal will not be assessed using the environmental impact statement process in Chapter 3 of the *Environmental Protection Act 1994* (EP Act). Please find attached comments from Energy, Extractive and Southwest Compliance.

The Department of State Development, Infrastructure, Local Government and Planning has advised that the proposal is not currently being assessed as a coordinated project under Part 4 of the *State Development and Public Works Organisation Act 1971* and is not likely to be assessed under this process in the future.

Should you have any further enquiries, please contact me on telephone **s. 47F(1)** .

Yours sincerely

s. 47F(1)

Director, Technical and Assessment Services

Level 9
400 George Street Brisbane
GPO Box 2454 Brisbane
Queensland 4001 Australia
Telephone s. 47F(1)
Facsimile s. 47F(1)
Website www.des.qld.gov.au
ABN 46 640 294 485

Energy, Extractive and Southwest Compliance comments on referral Towrie Gas Development PL 1059, QLD (EPBC 2021/8979)

Santos has submitted an application for an environmental authority for tenure PL1059. The application is currently in information request as we await their response.

Santos application to the Department of Environment and Science (DES) includes a number of impacts on Matters of State Environmental Significance that are also Matters of National Significance. These include:

| Protected Wildlife Habitat: Fauna | VMA Status | MNES |
|--|-----------------------|-------------|
| Reptiles: | | |
| Adorned delma (<i>Delma torquate</i>) | Vulnerable | Yes |
| Ornamental snake (<i>Denisonia maculate</i>) | Vulnerable | Yes |
| Yakka Skink (<i>Egernia rugosa</i>) | Vulnerable | Yes |
| Dunmall's snake (<i>Furina dunmalli</i>) | Vulnerable | Yes |
| Birds: | VMA Status | MNES |
| Red goshawk (<i>Erythrorchis radiatus</i>) | Vulnerable | Yes |
| Grey falcon (<i>Falco hypoleucos</i>) | Vulnerable | Yes |
| Squatter pigeon (southern) (<i>Geophaps scripta scripta</i>) | Vulnerable | Yes |
| Painted honeyeater (<i>Grantiella picta</i>) | | Yes |
| White-throated needletail (<i>Hirundapus caudacutus</i>) | Vulnerable | Yes |
| Australian painted snipe (<i>Rostratula australis</i>) | Endangered | Yes |
| Fork-tailed swift | Special Least Concern | Yes |
| Glossy ibis | Special Least Concern | Yes |
| Oriental Cuckoo | Special Least Concern | Yes |
| Satin flycatcher | Special Least Concern | Yes |

| | | |
|---|-----------------------|-------------|
| Rufous fantail | Special Least Concern | Yes |
| Latham's snipe | Special Least Concern | Yes |
| Mammals: | VMA Status | MNES |
| Large-eared pied bat (<i>Chalinolobus dwyeri</i>) | Vulnerable | Yes |
| South-eastern long-eared bat (<i>Nyctophilus corbeni</i>) | Vulnerable | Yes |
| Greater glider (<i>Petauroides volans</i>) | Vulnerable | Yes |
| Koala (<i>Phascolarctos cinereus</i>) | Vulnerable | Yes |

As Santos has referred the above Matters to DAWE they have not been assessed under the *Environmental Protection Act 1994* and *Offsets Act 2014*.

If the proposed application will or may have a significant impact on the matters listed above then it is recommended that approval under the EPBC is required.

DES has no further opportunities to ask for additional information to assess MSES that are also MNES if they are not assessed under the EPBC.

Santos has stated in Table ES-1 and Table 22 of the document, 'Matters of National Environmental Significance – Ecology Assessment, Towrie Development Project', that there would be potential risk to a number of MNES and that further assessment is required. As such, additional information may be required to address this uncertainty.

DES has no other relevant information to provide when considering if the proposed action is likely to have a significant impact on MNES.

DES has no comments on the assessment approach under the EPBC if the proposed activity is deemed a controlled action.

A contact officer within DES is as follows:

s. 47F(1)

Senior Environmental Officer
Energy, Extractive and Southwest Compliance
Department of Environment and Science

Phone s. 47F(1)

Email: s. 47F(1)

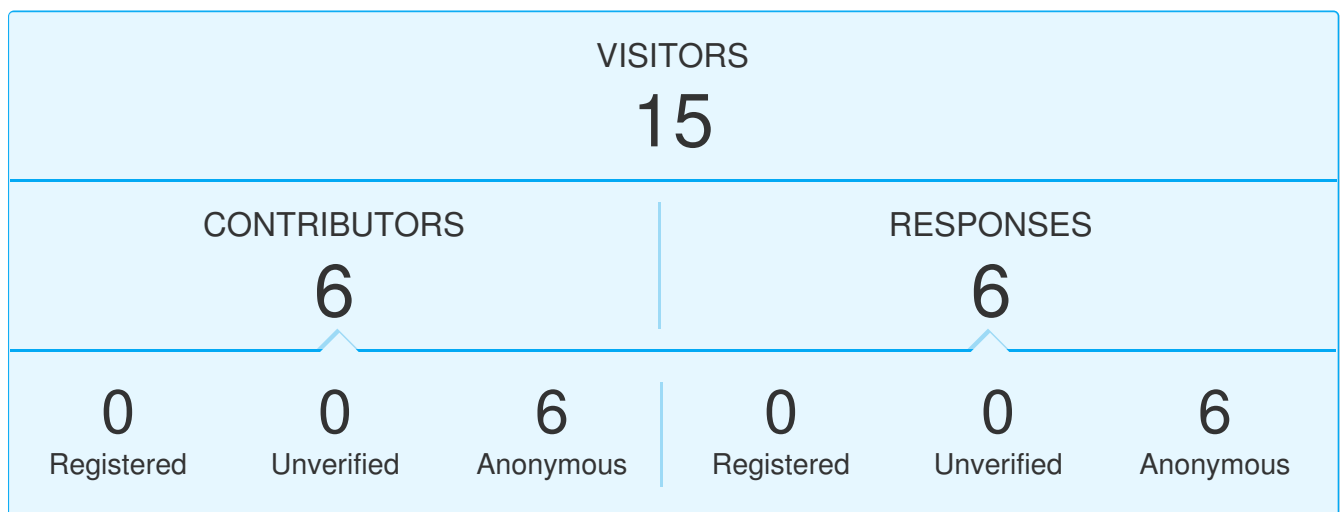
Survey Responses

14 June 2021 - 14 July 2021

Referral: EPBC 2021/8979 - Towrie Gas Development PL 1059, QLD

Have Your Say - Agriculture, Water and the Environment

Project: Public comments on EPBC Act referrals



**Respondent No:** 1**Login:** Anonymous**Email:** n/a**Responded At:** Jul 05, 2021 00:30:50 am**Last Seen:** Jul 05, 2021 00:30:50 am**IP Address:** n/a

Q1. **Name** s. 47F(1)

Q2. **Email address** s. 47F(1)

Q3. **Do you consider this is a controlled action?** Yes

Q4. **Provide reasons for why you believe this is/is not a controlled action.**

Please see the attached file.

Q5. **Do you have any attachments you wish to upload to support your feedback?** Yes

Q6. **Upload your file using the 'choose file' button. Please include any supporting documentation as one file.**

S. 47F(1)

Q7. **Is your response confidential?** No

Q8. **Please specify the parts of your response that are confidential**

not answered

Q9. **Confirm that you have read and understand this privacy notice.** Yes

Q10. **Confirm that you have read and understand this declaration.** Yes

**Respondent No:** 2**Login:** Anonymous**Email:** n/a**Responded At:** Jul 12, 2021 11:43:17 am**Last Seen:** Jul 12, 2021 11:43:17 am**IP Address:** n/a

Q1. **Name** s. 47F(1)

Q2. **Email address** s. 47F(1)

Q3. **Do you consider this is a controlled action?** Yes

Q4. **Provide reasons for why you believe this is/is not a controlled action.**

The proposed project is likely to have a significant impact on several threatened flora and fauna species including Ooline and the endangered Brigalow ecological community and many animals listed at threatened under our environment laws. (Ornamental Snake, Yakka Skink, Large-eared Pied Bat, South-eastern Long-eared Bat, Koala, Dunmall's Snake and Painted Honeyeater.). The proponent (Santos) acknowledges that their surveys have been inadequate. Their surveys were geographically restricted, did not include the entire southern portion of the project area which includes a suite of vegetation communities found along waterways. Furthermore, where surveys were conducted, they were time-limited and were not conducted in all seasons as required to adequately characterise biodiversity. Santos admite that the survey effort was insufficient for a number of fauna, including bat species. This is a great concern as a number of threatened bat species are known or likely to occur in the area. Santos' modelling of species distribution is flawed and subjective. They claim it shows that there will be no significant impact on any of the numerous threatened species that occur, yet no evidence is provided to support this claim. The value of small patches of remnant native vegetation appears to have been ignored. The proposed development will have a major impact on habitat connectivity in a heavily cleared landscape. Important 'stepping stone' habitats which connect Arcadia Creek in the east to the vegetated habitat in the west, particularly along the creek system in the southern part of the project area will be disrupted, preventing native animals' safety of movement. In relation to water resources: The demand for water to hydraulically fracture a large number of CSG wells has not been properly considered. The project has not been included in the Underground Water Impact Report model and therefore the cumulative impact of it in association with other CSG projects is not properly considered. Up to 30ML per of water per well is required yet the source of that water and the likely environmental impacts (and those on existing users) are not addressed. The referral limits consideration of groundwater impacts to within a 25km radius, despite most assessments using a 50km radius. This is in spite of acknowledging potential drawdown of aquifers 20km away near the Dawson River. As a result, the risks to water bores and to spring systems are likely to be greater than predicted. The project MUST be a controlled action and thoroughly assessed.

Q5. **Do you have any attachments you wish to upload to support your feedback?** No

Q6. **Upload your file using the 'choose file' button. Please include any supporting documentation as one file.** not answered

Q7. **Is your response confidential?** No

Q8. **Please specify the parts of your response that are confidential**

not answered

Q9. Confirm that you have read and understand this Yes
privacy notice.

Q10. Confirm that you have read and understand this Yes
declaration.

**Respondent No:** 3**Login:** Anonymous**Email:** n/a**Responded At:** Jul 12, 2021 21:55:53 pm**Last Seen:** Jul 12, 2021 21:55:53 pm**IP Address:** n/a

Q1. **Name** s. 47F(1)

Q2. **Email address** s. 47F(1)

Q3. **Do you consider this is a controlled action?** Yes

Q4. **Provide reasons for why you believe this is/is not a controlled action.**

In relation to biodiversity: It is likely to have a significant impact on a number of threatened fauna species including Ornamental Snake, Yakka Skink, Large-eared Pied Bat, South-eastern Long-eared Bat, Koala, Dunmall's Snake and Painted Honeyeater. It also poses a risk to threatened flora like Ooline and endangered ecological communities such as Brigalow. The surveys that were conducted were demonstrably inadequate. Surveys were very restricted geographically and did not sample the entire southern portion of the project area which includes a matrix of vegetation along waterways. Furthermore, even in the areas where surveys were conducted, it was limited in time and did not include surveys across seasons, as is properly required to characterise biodiversity. Santos themselves acknowledge that the survey effort was insufficient for a number of fauna, including bat species, which is a concern, given a number of threatened bats are known or likely to occur. Santos' modelling of species distribution is flawed and subjective. They basically use this modelling to conclude that there will be no significant impact on any of the numerous threatened species that occur. Yet there is little explanation as to how they arrive at this conclusion, and they seem to subjectively discount the habitat value of small patches of vegetation in the productive lowlands with no sound ecological basis. Their proposed constraints protocol is inadequate, because it proposes to allow petroleum activities even in very significant areas for conservation such as the Public Reserve which contains the Brigalow endangered ecological community and adjoins a large wetland area. The assessment discounts the value of the gilgai areas for conservation, despite their habitat value for a number of species. The proposed development will have a major impact on habitat connectivity in a heavily cleared landscape – it will disrupt the important stepping stone habitats which connect Arcadia Creek in the east to the vegetated habitat in the west, particularly along the creek system in the southern part of the project area. In relation to water resources: The proposal fails to properly consider the demand for water to conduct hydraulic fracturing of so many wells. Given that fracking requires as much as 30ML per of water per well, the source of that water and the likely environmental impacts should be fully addressed in this referral. This project has not been included in the Underground Water Impact Report model and therefore the cumulative impact of it in association with other CSG projects is not properly considered. The referral limits consideration of groundwater impacts to within a 25km radius, despite most assessments using a 50km radius, and despite acknowledging potential drawdown of aquifers 20km away near the Dawson River. As a result of this limited radius for consideration, we believe the risks to water bores and to spring systems are greater than predicted. Our beef cattle property is located on the western side of the Galilee Basin which is part of the feed in to the Great Artesian Basin. There are a number of mining companies including Adani that plan on mining the basin. None of the companies have been able to prove in the Land Court that they will NOT damage the Great Artesian Basin for perpetuity. For Australia the driest inhabited country on earth to be sacrificing water sources like the internationally iconic Great Artesian Basin which supplies water for over 22% of Australia for unsustainable climate wrecking projects is incomprehensible. Vast areas of Australia are still in drought and our governments are doing and planning projects that will cause permanent destruction to the nation's vital water supplies. These policies and decisions reflect those of a third world country.

Q5. **Do you have any attachments you wish to upload to support your feedback?** No

Q6. Upload your file using the 'choose file' button. not answered

Please include any supporting documentation as one file.

Q7. Is your response confidential? No

Q8. Please specify the parts of your response that are confidential

not answered

Q9. Confirm that you have read and understand this privacy notice. Yes

Q10. Confirm that you have read and understand this declaration. Yes

**Respondent No:** 4**Login:** Anonymous**Email:** n/a**Responded At:** Jul 13, 2021 12:49:08 pm**Last Seen:** Jul 13, 2021 12:49:08 pm**IP Address:** n/a

Q1. **Name** s. 11C(1)(a)

Q2. **Email address** s. 11C(1)(a)

Q3. **Do you consider this is a controlled action?** Yes

Q4. **Provide reasons for why you believe this is/is not a controlled action.**

Please see attachment.

Q5. **Do you have any attachments you wish to upload to support your feedback?** Yes

Q6. **Upload your file using the 'choose file' button. Please include any supporting documentation as one file.**

s. 11C(1)(a)

Q7. **Is your response confidential?** Yes, part of it

Q8. **Please specify the parts of your response that are confidential**

All personal information of all signatories to the submission.

Q9. **Confirm that you have read and understand this privacy notice.** Yes

Q10. **Confirm that you have read and understand this declaration.** Yes

**Respondent No:** 5**Login:** Anonymous**Email:** n/a**Responded At:** Jul 13, 2021 14:47:24 pm**Last Seen:** Jul 13, 2021 14:47:24 pm**IP Address:** n/a

- Q1. **Name** s. 47F(1) for Lock the Gate Alliance
-
- Q2. **Email address** s. 47F(1)
-
- Q3. **Do you consider this is a controlled action?** Yes
-
- Q4. **Provide reasons for why you believe this is/is not a controlled action.**
- I believe this is a controlled action because it is likely to have a significant impact on threatened species, migratory species and water resources.
-
- Q5. **Do you have any attachments you wish to upload to support your feedback?** Yes
-
- Q6. **Upload your file using the 'choose file' button. Please include any supporting documentation as one file.** https://s3-ap-southeast-2.amazonaws.com/ehq-production-australia/5892c9f777330b04c8d8e2f04bea9f624528a8d6/original/1626151604/8bc50d134dca9f7beb69ff5e12e79d4c_210713_EPBC_Submission_Santos_Towrie_CSG.pdf?1626151604
-
- Q7. **Is your response confidential?** No
-
- Q8. **Please specify the parts of your response that are confidential**
- not answered
-
- Q9. **Confirm that you have read and understand this privacy notice.** Yes
-
- Q10. **Confirm that you have read and understand this declaration.** Yes
-

**Respondent No:** 6**Login:** Anonymous**Email:** n/a**Responded At:** Jul 13, 2021 16:15:46 pm**Last Seen:** Jul 13, 2021 16:15:46 pm**IP Address:** n/a

Q1. **Name** s. 47F(1)

Q2. **Email address** s. 47F(1)

Q3. **Do you consider this is a controlled action?** Yes

Q4. **Provide reasons for why you believe this is/is not a controlled action.**

Towrie Gas Development PL 1059, QLD should be a controlled action; with full EIS required. Issues: 1. Threatened and endangered species including: • Ornamental Snake • Yakka Skink • Large-eared Pied Bat • South-eastern Long-eared Bat • Koala • Dunmall's Snake • Painted Honeyeater 2. Water Resources 1. Mitigation methods proposed to reduce impact on threatened species are entirely inadequate. Relocation sites are almost certainly fully occupied and unlikely to be available to any fauna disturbed. Major impacts are likely on habitat connectivity - disrupting the important habitats which connect Arcadia Creek to the vegetated habitat in the west, particularly along the creek system in the southern part of the project area which was not sampled at all. Threatened flora like Ooline and endangered ecological communities such as Brigalow are at risk, even in very significant conservation areas such as the Public Reserve which contains a Brigalow ecological community and adjoins a large wetland area. The assessment discounts the value of the gilgai, despite their habitat value for a number of species. Surveys were: • Demonstrably insufficient for a number of fauna species including bats: a serious concern given that a number of threatened bat species are likely to occur. • Limited geographically and seasonally and do not meet requirements to properly characterise biodiversity. Santos' modelling of species distribution was flawed and improperly used to conclude that there would be no significant impact on any of the numerous threatened species that occur. 2 The environmental impacts of both water demand and water extraction are inadequately addressed: • Demand: hydraulic fracturing of 110 or more wells: up to 30ML of water per well. • Extraction: 2.2 million litres of groundwater a day at peak production. This project has not been included in the Underground Water Impact Report model and therefore the cumulative impact of it in association with other CSG projects is not properly considered. The referral limits consideration of groundwater impacts to within a 25km radius, despite most assessments using a 50km radius, and despite acknowledging potential drawdown of aquifers 20km away near the Dawson River. I believe the risks to water bores and spring systems are greater than predicted. For this development the radius for consideration arguably should be much greater than 50km. The Hutton and Precipice Aquifers are the source of water for the spring system in the Dawson River which provides habitat for threatened species, including platypus. These aquifers are also the water source for the important ecological communities of Boggomosses downstream of Taroom and in the Palm Tree Creek area. There has been no account of the potential impacts on those. The Taroom community, population approximately 870, depends for the local water supply on two bores tapping the Precipice Sandstone. Increasing concerns regarding chemicals used in gas and petroleum drilling and production should be considered. Chemicals should be clearly identified and chemicals and their characteristics, when broken down, fully accounted for in the EIA process. They potentially have devastating, long term impacts on wildlife and on human health. s. 47F(1)

Q5. **Do you have any attachments you wish to upload to support your feedback?** Yes

Q6. **Upload your file using the 'choose file' button. Please include any supporting documentation as one file.** https://s3-ap-southeast-2.amazonaws.com/ehq-production-australia/7c0e93cb9c52b5bb5760450065306224dcd41533/original/1626156378/d8ed1a0f0da917ddf37ce8f1fceb91dc_Attachment_Submission_re_Towrie_Gas_Development_PL_1059.docx?1626156378

Q7. Is your response confidential?

No

Q8. Please specify the parts of your response that are confidential

not answered

Q9. Confirm that you have read and understand this privacy notice. Yes

Q10. Confirm that you have read and understand this declaration. Yes

EPBC Act Referral 2021/8979 - Towrie Gas Development PL 1059

Dear Minister Sussan Ley,

I am writing in relation to your invitation to comment on the Towrie Gas Development, QLD. The proposed plan by Santos CSG Pty Ltd includes the construction of up to 116 new gas wells to mine coal seam gas (CSG), and states "Hydraulic fracture stimulation will be used to complete the wells". The proponent describes an action area of 8678 ha with a directly disturbed area of 867 ha and states that the potential impacts are not significant and are not likely. However, given the nature of the project and proximity to similar projects in the area I believe this referral understates the scale and magnitude of the proposed action's impacts, particularly those that relate to Matters of National Environmental Significance (MNES) and the impact to surrounding agricultural lands.

Impact on MNES; Threatened Ecological Communities/ Species

The proponent argues that this project should not be a controlled action as there is no 'significant' impact on MNES. However, the referral states that the proposed activity will have the potential to impact on 5 TEC, 8 threatened species of flora, and 14 threatened species of fauna. The proponent refers to areas directly affected by the project in terms of the clearance of foraging and/or breeding habitat. I believe the assumptions made about potential disturbance to these threatened species greatly underestimate the true scale of disturbance in terms of its extent and magnitude. Further studies are needed to understand the effect of erosion, dust and sedimentation on ground cover and vegetation growth in this region. Disturbance caused by construction, machinery, light, and noise also restrict potential habitat for threatened species of fauna, and their ability to reproduce under stressed conditions. This is not considered under the disturbance referred to in this referral. This is of great importance when considering the survival of threatened species with declining populations such as the northern quoll for example, a species known to be in decline due to reduced groundcover and sensitive to noise and light disturbance. I would suggest that the extent of habitat disturbed will be greater than what the proponent has stated. As this project is proposed to run for 30 years it is also important to consider the cumulative effects both over time and alongside other projects in the area causing an increase in greenhouse gas emissions, invasive species, land clearing and degradation and habitat fragmentation.

Impact on MNES; Migratory Species

The proponent also indicates that the action will have potential effect on 6 species of migratory birds. Two of these species, Latham's Snipe and the Glossy Ibis, are known to use a constructed wetland to the north of the site. This same wetland is also used as foraging and breeding habitat for the endangered Australian Painted Snipe, and described as critical for the survival of the species. The effect is described as being non-significant as it is not predicted to have a large direct effect on the foraging habitats of migratory birds, however the potentially significant effect to water quality of the wetlands has not been accounted for. Water quality is likely to be affected by dust and sedimentation, increasing turbidity and limiting light availability to freshwater plants and organisms, which in turn could impact the entire system. Furthermore, studies on the impact of CSG produced water on surface water quality indicate that if not properly treated, tested, and monitored, discharge and runoff can lead to toxic levels of trace metals in natural waterways and cause environmental degradation. (Ali et al. 2017)

Impact on Agriculture

Much of the area surrounding the site is occupied by cattle-grazing. Farmers use bores to access groundwater to feed water troughs for cattle and irrigate crops. One of main concerns held by landholders is the effect of CSG on groundwater and surface water. The referral states that wells will not be drilled within 90 metres of registered bores. However, there are few long-term studies to give an accurate model of the magnitude and extent that CSG water withdrawal can impact on groundwater drawdown and effect groundwater flow. Some studies suggest drawdown can impact a 10km radius. (Post et al. 2020) This is a major concern for farmers if groundwater drawdown results in subsidence, the downwards settlement of the grounds surface which creates drainage issues. (Pineda & Sheng 2014) Another potential outcome of groundwater drawdown is increase in groundwater salinity which in turn can effect crop productivity. (Abadeh et al. 2006) Finally, there is also risk of aquifer contamination from wells. This is particularly concerning because the action includes hydraulic fracturing which has the potential to release naturally occurring BTEX (benzene, toluene, ethylbenzene and xylenes), benzene being carcinogenic. If this were to contaminate groundwater aquifers or surface waters, there would be significant risk to human health and natural ecosystems. Due to the size of the project, proximity to other CSG projects in the Arcadia Valley region and 30-year proposal, there should be a cumulative hydrological impact assessment undertaken.

Santos Track Record

I have discussed how this proposed action has the potential to cause significant impact, however there is also the matter of the likelihood of these impacts. The proponent claims the activity is unlikely to have any significant impact however Santos has a track record of incidents involving contamination, failure to meet conditions and breaches of the law. Under this referral it is noted that in June 2013 Santos was fined \$52 500 breaching the NSW Petroleum Act 1991 in relation to reporting failures in the Piliga Forest (concerning an untreated water spill and previous incidents) and in July 2018 Santos was fined \$68 000 by the Queensland Department of Environment and Science for the unauthorised release of hydrocarbons to land. In addition to this, Santos was found in 2013 to have leaked CSG produced water from holding ponds into groundwater beneath, in 2014 to have contaminated another aquifer with uranium and in 2015 another CSG water leak was found at the company's Dewhurst Southern Water Flow Line. (Hannam 2015) Due to the media coverage following these described incidents, Santos has gained attention from the public who are concerned about the management of their projects and risk to public health and the environment.

In conclusion, I believe that this action poses a likely risk of causing significant impact to matters of national environmental significance as well as to the surrounding agricultural lands and communities. For the reasons discussed I strongly recommend that it be regarded as a "controlled action". The referral indicates that Santos has applied for a new EA to authorise the proposed action, it is recommended an EIS is included to further assess cumulative impacts. Further assessment should be directed to understanding the indirect and cumulative impacts of this activity on MNES and cumulative hydrological impacts to both groundwater and surface water. There should be a more detail rehabilitation plan to ensure land can be returned to effective farmland or natural habitats in accordance with habitat criteria for endangered species and threatened ecological communities. There should also be a CSG wastewater treatment plan that recycles water to beneficial use. Lastly, it would be beneficial to monitor impacts of this project across the activity's duration in an effort to collect data that may be of use to the planning of future CSG mining ventures.

s. 47F(1)

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Submission re **Towrie Gas Development PL 1059, QLD, supporting documentaion**

Nathan Dam and Pipelines EIS Figure 15.2

<https://eisdocs.dsdip.qld.gov.au/Nathan%20Dam%20and%20Pipelines/EIS/Chapters/chapter-15-groundwater.pdf>