Exert from current (Friday 19 March 2010) Draft Environmental Authority Conditions for Dalby Expansion Project being negotiated between Arrow Energy and the Queensland Department of Environment and Resource Management.

SCHEDULE D — Land

General

(D1) Contaminants that will or may cause environmental harm must not be directly or indirectly released to land except as permitted under this environmental authority.

(D2) Prior to conducting petroleum activities that involve significant disturbance to land, an assessment must be undertaken of the condition, type and ecological value of any vegetation in such areas where the activity is proposed to take place.

(D3) The assessment required by condition D2 must be undertaken by a suitably qualified person and include the carrying out of field validation surveys, observations and mapping of any category A, B or C Environmentally Sensitive Areas (ESA's).

(D4) The holder of this environmental authority, when carrying out petroleum activities must:

(a) avoid, minimise or mitigate (in order of preference) any impacts on areas of vegetation or other areas of ecological value;
(b) minimise the risk of injury, harm, or entrapment to wildlife and stock;
(c) minimise disturbance to land that may otherwise result in land degradation;
(d) ensure that for land that is to be significantly disturbed by petroleum activities:
i. the top layer of the soil profile is removed;
ii. stockpiled in a manner that will preserve its biological and chemical properties; and
iii. used for rehabilitation purposes (in accordance with condition H6) and
(e) prior to carrying out field based activities, make all relevant staff, contractors or agents carrying out those activities, aware of the location of any category A, B or C ESA's and the requirements of this environmental authority.

(D5) In accordance with condition (D4) above, if significant disturbance to land is unavoidable, the holder of this environmental authority must not clear vegetation or place fill:

(a) in a way which significantly isolates, fragments or dissects tracts of vegetation resulting in a reduction in the current level of ecosystem functioning, ecological connectivity (i.e. stepping stone or contiguous bioregional/local corridor networks) and/or results in an increase in threatening processes (e.g. potential impacts associated with edge effects or introduced species);
(b) on slopes greater than 10% for activities other than pipelines and wells; or
(c) in discharge areas.

(D6) Clearing of remnant vegetation shall not exceed ten (10) metres in width for the purpose of establishing tracks and 20 metres in width for dual carriageway roads unless otherwise approved by the administering authority in writing.

(D7) Cleared vegetation must be stockpiled in a manner that facilitates respreading or salvaging and does not impede vehicle, stock or wildlife movements.

Disturbance to Land – Environmentally Sensitive Areas

(D8) Notwithstanding conditions (D2) to (D7) inclusive, the holder of this environmental authority must ensure that petroleum activities:

(a) are not conducted in or within 1km of a listed category A ESA, or within 500m of a listed category B or C ESA; and
(b) do not involve activities other than limited petroleum activities within 200 metres of any listed category A, B or C ESA's.

(D9) Limited petroleum activities carried out in accordance with condition (D8)(b) must be preferentially located in pre-existing areas of clearing or significant disturbance to the greatest practicable extent.

Disturbance to Land – Endangered and Of Concern Regional Ecosystems

(D10) Despite condition (D8), where it can be demonstrated that no reasonable or feasible alternative exists, limited petroleum activities may be undertaken within an endangered/of concern regional ecosystem and its associated buffer zone, provided that the area is not part of another listed category A, B or C ESA (e.g. a National Park) or associated buffer zone, subject to the following:

(a) the limited petroleum activity is located and carried out in areas according to the following order of preference:
  i. pre-existing cleared areas or significantly disturbed areas less than 200m from an Endangered/Of Concern RE;
  ii. undisturbed areas less than 200m from an Endangered/Of Concern RE;
  iii. pre-existing areas of significant disturbance within an endangered/of concern regional ecosystem (e.g. areas where significant clearing or thinning has been undertaken within a regional ecosystem, and/or areas containing high densities of weed or pest species which has inhibited re-colonisation of native regrowth);
  iv areas where clearing of an endangered or of concern regional ecosystem is unavoidable;
(b) any vegetation clearing in an Endangered/Of Concern RE or associated buffer zone must not exceed any of the following areas:
  i. 10% of the remnant unit of Endangered/Of Concern regional ecosystem as ground truthed and mapped before any activity commences as per condition D1 and D2 of this environmental authority for the life of the project; or
  ii. more than $30m^2$ for the construction of a sump; or
  iii. six (6) metres in width for tracks; or
  iv. twelve (12) metres in width for pipeline construction purposes; and
(c) all reasonable and practical measures are taken to minimize the area cleared and to avoid the clearing of mature trees, which must include but not be limited to, for each well site, a risk assessment to determine the minimum amount of disturbance possible.

(D11) Details of any significant disturbance to land in or within 200m of Endangered or Of Concern regional ecosystems, along with a record of the assessment required by Conditions (D2) and (D3) must be kept and submitted to the administering authority upon request.

(D12) If the assessment required by conditions (D2) and (D3) indicates that an ecosystem mapped as Endangered or Of Concern regional ecosystem by the Queensland Herbarium should be in a lower conservation value classification and the holder of this environmental authority wishes to undertake activities as if the ecosystem is of the lower conservation value they must notify the administering authority in writing before any significant disturbance to land takes place.

(D13) If, within the 20 business days following the lodgement of the notification under condition (D12) the administering authority notifies the holder of this environmental authority, in writing, that the regional ecosystem mapping requires further validation, then significant disturbance to land in the mapped regional ecosystem are prohibited until the administering authority provides written advice that significant disturbance to land may proceed.

(D14) When requested by the administering authority, the environmental authority holder must enter into an agreement with the administering authority to provide an environmental offset to counterbalance the impacts of the activity on Endangered or Of Concern regional ecosystem.

(D15) The holder of this environmental authority must comply with any environmental offset agreement made in accordance with the conditions of this environmental authority.

Disturbance to Land – State Forests and Timber Reserves

(D16) Despite condition (D8), activities may be undertaken within State Forests or Timber Reserves under the *Forestry Act 1959* (Act).

(D17) Where activities are to be undertaken in a State Forest or Timber Reserve that are also Endangered or Of Concern Regional Ecosystems, such activities may be undertaken in accordance with condition (D10) of this environmental authority.

Soil Management

(D18) The holder of this environmental authority must develop and implement soils management procedures for areas to be disturbed by petroleum activities prior to commencement of petroleum activities in these areas to prevent or minimise soil disturbance. These procedures must include but not be limited to:

(a) establishment of baseline soils information for the area of disturbance including soil depth, pH, electrical conductivity (EC), chloride, cations (calcium, magnesium and sodium), exchangeable sodium percentage (ESP), particle size and soil fertility (including nitrogen, phosphorous, potassium, sulphur and micronutrients);
(b) implementation of a soils monitoring program outlining parameters to be monitored, frequency of monitoring and maximum limits for each parameter; and
(c) identify soil units within areas to be disturbed by petroleum activities at a scale of 1:100000, in accordance with the *"Guidelines for Surveying Soil and Land Resources, 2nd Edition"* (McKenzie *et al.* 2008), *"Australian Soil and Land Survey Handbook, 3rd Edition"* (National Committee on Soil and Terrain 2009) and *"The Australian Soil Classification"* (Isbell 2002);
(d) detail mitigation measures and procedures to manage the risk of adverse soil disturbance in the carrying out of the petroleum activity; and
(e) for areas of good quality agricultural land, detail methods to be undertaken to minimise potential impacts.

(D19) A copy of the soils management procedures must be made available to the administering authority upon request.

Acid Sulfate Soils

(D20) The holder of this environmental authority must, when clearing in areas with acid sulfate soils, develop and implement an acid sulfate soil environmental management plan prepared in accordance with the *"State Planning Policy 2/02 Guideline Planning and Managing Development Involving Acid Sulfate Soils"* and the Department of Environment and Resource Management's *"Queensland Acid Sulphate Soil Technical Manual" (Version 2.2 September 2004)* or more recent editions or supplements to these documents as such become available.

Note: *condition (D20) is only applicable in areas of acid sulfate soils or potential acid sulfate soils. These areas should be identified in the Environmental Management Plan accompanying the application.*

Fauna Management

(D21) The holder of this environmental authority must develop and implement fauna management procedures for the carrying out of the petroleum activities, in particular pipeline construction, construction and use of dams, to prevent or minimise harm or the potential risk of causing harm to fauna.

(D22) The fauna management procedures must include training and awareness of staff and contractors and ensure that any planned fauna handling is undertaken by a suitably qualified person.

(D23) A copy of the fauna management procedures must be made available to the administering authority on request.

Pest Management

(D24) In carrying out the petroleum activities the holder of this environmental authority must develop and implement an effective pest management procedure that includes but is not limited to the following:

(a) identification of pest species and infestation areas;
(b) prevents and/or minimises the introduction and/or spread of pests; and
(c) control and management of pest outbreaks as a result of petroleum activities.

(D25) A copy of the pest management procedure must be made available to the administering authority on request.

Note: *The pest management procedure required by condition (D24) should consider the* "Petroleum Industry (including coal seam methane gas) Minimising Pest Spread Guidelines" *dated June 2008, or subsequent versions thereof. This document is available for download from:* *http://www.dpi.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Minimising-Pest-Spread-Advisory-Guidelines.pdf*

Chemical and Fuel Storage

(D26) All explosives, hazardous chemicals, corrosive substances, toxic substances, gases, dangerous goods, flammable and combustible liquids (including petroleum products and associated piping and infrastructure) must be stored and handled in accordance with the relevant Australian Standard where such is available.

(D27) Notwithstanding the requirements of any Australian Standard, any liquids stored on site that have the potential to cause environmental harm must be stored in or serviced by an effective containment system that is impervious to the materials stored and managed to prevent the release of liquids to waters or land. Where no relevant Australian Standard is available, the following must be applied:

(a) storage tanks must be bunded so that the capacity and construction of the bund is sufficient to contain at least 110% of a single storage tank or 100% of the largest storage tank plus 10% of the second largest storage tank in multiple storage areas; and
(b) drum storages must be bunded so that the capacity and construction of the bund is sufficient to contain at least 25% of the maximum design storage volume within the bund.

(D28) All containment systems must be designed to minimise rainfall collection within the system.

Definitions:

"category A ESA" means any area listed in Section 25 of the *Environmental Protection Regulation 2008.*
"category B ESA" means any area listed in Section 26 of the *Environmental Protection Regulation 2008.*
"category C ESA" means any of the following areas:

- Nature Refuges as defined under the *Nature Conservation Act 1992*;
- Koala Habitat Areas as defined under the *Nature Conservation Act 1992*;
- State Forests or Timber Reserves as defined under the *Forestry Act 1959*;
- Declared catchment areas under the *Water Act 2000*;
- Resources reserves under the *Nature Conservation Act 1992*
- An area identified as "Essential Habitat" for a species of wildlife listed as endangered, vulnerable, rare or near threatened under the *Nature Conservation Act 1992*;
- Any wetland shown on the Map of Referable Wetlands available from DERM's website; or
- "Of concern" regional ecosystems identified in the database maintained by DERM called 'Regional ecosystem description database' containing regional ecosystem numbers and descriptions.

"clearing" means:

- in relation to grass, scrub or bush—the removal of vegetation by disturbing root systems and exposing underlying soil (including burning), but does not include—
    - the flattening or compaction of vegetation by vehicles if the vegetation remains living; or
    - the slashing or mowing of vegetation to facilitate access tracks; or
    - the clearing of noxious or introduced plant species; and
- in relation to trees—cutting down, ringbarking, pushing over, poisoning or destroying in any way.

"limited petroleum activities mean activities including geophysical surveys (including seismic activities), well sites, well pads, sumps, flare pits, flow lines and supporting access tracks. Limited petroleum activities do not include the construction of production infrastructure for processing or storing petroleum or by-products, dams, compressor stations, campsites/workforce accommodation, power supplies, waste disposal or other supporting infrastructure for the project.

Approved Conservation Advice
(s266B of the *Environment Protection and Biodiversity Conservation Act 1999*)

Approved Conservation Advice for *Philotheca sporadica*

This Conservation Advice has been developed based on the best available information at the time this Conservation Advice was approved; this includes existing plans, records or management prescriptions for this species.

Description

Philotheca sporadica, Family Rutaceae, is an open to compact shrub to 150 cm high, with numerous branches (Halford, 1995). Each branch has many small, 1–4 mm long, hairless, club-shaped leaves along its length. The white flowers are solitary and occur on short stalks to 0.7 mm long at the end of branchlets (Halford, 1995).

Conservation Status

Philotheca sporadica is listed as **vulnerable**. This species is eligible for listing as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) as, prior to the commencement of the EPBC Act, this species was listed as vulnerable under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth), as *Eriostemon sporadicus*. *Philotheca sporadica* is also listed as vulnerable under Schedule 3 of the *Nature Conservation Act 1992*, and on the *Nature Conservation (Wildlife) Regulation 2006* (Queensland).

Distribution and Habitat

Philotheca sporadica is known from south-east Queensland, from just north of Tara, to approximately 12 km east of Kogan. The Queensland Herbarium has recorded 11 populations. Seven of these occur on road verges, seven extend onto freehold land (Halford, 1995) and another population is within Braemar State Forest (SF 4). Approximately 84% of individuals are from two populations and 54% are on private property (Halford, 1995). The total population size is estimated to be in excess of 64 000 individuals (HLA-Envirosciences Pty Limited, 2005; Powerlink Queensland, 2005).

Philotheca sporadica is found on residual hills which are remnants of laterised Cretaceous sandstones, where the soils are shallow, uniform sandy loams to clay loams of extremely low fertility and poor condition (Dawson, 1972). It occurs primarily in low open forest of *Acacia burrowii*, *Eucalyptus exserta*, *E. crebra*, *E. fibrosa* subsp. *nubila* and *Callitris glaucophylla* (Halford, 1995).

The species occurs within the Condamine and Border Rivers Maranoa–Balonne (Queensland) Natural Resource Management Regions.

The distribution of this species overlaps with the following EPBC Act-listed threatened ecological communities:

- Brigalow (*Acacia harpophylla* dominant and co-dominant); and
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Threats

The main identified threat to *P. sporadica* is loss of habitat. The lack of secure land tenure is considered a serious risk in the long term. Many populations occur on roadsides and are at risk from general road maintenance activities and inappropriate use of sites.

The main potential threats to *P. sporadica* are grazing, invasive weeds, and inappropriate fire regime.

Although the species' response to grazing is unknown, seven populations extend onto freehold land that has been used for intermittent grazing (Halford, 1995). Considerable evidence of chewing on the trunks of *P. sporadica* was noted in the Darling Downs region and was thought to have been caused by wallabies. Swamp Wallabies (*Wallabia bicolor*) are known to occur in the region (Kanowski, 2005). Mother of Millions (*Bryophyllum* sp.) has been recorded at the Warra Road site and may cause problems in future due to its invasive nature (Halford, 1995). The response of *P. sporadica* to fire is uncertain.

Research Priorities

Research priorities that would inform future regional and local priority actions include:

- Design and implement a monitoring program.
- Undertake survey work in suitable habitat and potential habitat to locate any additional populations/occurrences.

Regional and Local Priority Actions

The following regional and local priority recovery and threat abatement actions can be done to support the recovery of *P. sporadica.*

Habitat Loss, Disturbance and Modification

- Monitor sites to identify key threats.
- Monitor the progress of recovery, including effectiveness of management actions and the need to adapt them if necessary.
- Minimise adverse impacts from changed land use at known sites, and protect from grazing and fire if necessary.
- Identify sites of high conservation priority.
- Protect areas of native vegetation which contain populations/occurrences/remnants of *P. sporadica.*
- Ensure chemicals or other mechanisms used to eradicate weeds do not have a significant adverse impact on *P. sporadica* populations.
- Ensure road widening and maintenance activities in areas where *P. sporadica* occurs do not adversely impact on known populations.
- Investigate formal conservation arrangements, such as covenants or inclusion in reserve tenure.

Grazing or Browsing

- Prevent total grazing pressure at known sites through exclusion fencing or other barriers.

Invasive Weeds

- Develop and implement a management plan for the control of weeds, including Mother of Millions, in the local region.
- Manage sites to prevent introduction of invasive weeds, which could become a threat to *P. sporadica,* using appropriate methods.

Conservation Information

- Raise awareness of *P. sporadica* within the local community, particularly landowners and managers, and local authorities.

Establishing Additional Populations

- Investigate options for linking, enhancing or establishing additional populations.
- Undertake appropriate seed collection and storage.

- Implement national translocation protocols (Vallee et al., 2004) if establishing additional populations is considered necessary and feasible.

This list does not necessarily encompass all actions that may be of benefit to *P. sporadica*, but highlights those that are considered to be of highest priority at the time of preparing the conservation advice.

Information Sources:

Dawson, NM 1972, *Land Inventory and Technical Guide: Miles area, Queensland: Part 1, Land Classification and Land Use*, Division of Land Utilisation, Technical Bulletin No. 5, Queensland Department of Primary Industries, Brisbane.

Halford, D 1995, *Eriostemon sporadicus Bayly (Rutaceae) A Conservation Statement*, A report submitted to the Australian Nature Conservation Agency Endangered Species Program Project No. 482, by Queensland Herbarium, Australian Nature Conservation Agency, Canberra.

HLA-Envirosciences Pty Limited 2005, *Ecological Assessment report Braemar Peaking Plant Site Near Dalby*, HLA-Envirosciences Pty Limited, Brisbane.

Kanowski, D 2005, '*Philotheca sporadica*- A Conservation Project', *Urimbirra*, vol. 39, no. 10, pp.4-5.

Powerlink Queensland 2005, *Kogan Creek Power Station Braemar 275 kv Transmission Line, Environmental Impact Statement Review*, Environmental Resources Management Australia, Qld.

Vallee, L, Hogbin, T, Monks, L, Makinson, B, Matthes, M & Rossetto, M 2004, *Guidelines for the Translocation of Threatened Plants in Australia - Second Edition*, Australian Network for Plant Conservation, Canberra.

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

From: s. 47F(1) @arrowenergy.com.au]
Sent: Thursday, 11 March 2010 6:24 PM
To: s. 22(1)(a)(ii)
Cc: Barker, James; s. 22(1)(a)(ii) s. 47F(1)
Subject: RE: Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344) [SEC=UNCLASSIFIED]

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

Thank you for your update on the referrals for the Dalby Expansion Project and the Surat Gas Project, it is much appreciated.

Should you require any further information to assist you with the assessment of these referrals, please don't hesitate to contact myself on s. 47F(1) .

Regards,

s. 47F(1)
EIS Project Director

From: s. 22(1)(a)(ii) @environment.gov.au]
Sent: Wednesday, 10 March 2010 12:37 PM
To: s. 47F(1)
Cc: Barker, James; s. 22(1)(a)(ii)
Subject: RE: Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344) [SEC=UNCLASSIFIED]

Hello s. 47F(1)
The current statutory decision date for both the the Dalby Expansion project and Surat Gas Project is 16 March 2010.
As far as I am aware, it is not anticipated that there will be any delay, however this in part depends on the availability of the Minister's delegate to consider the brief and to then make the referral decisions.

Regards
s. 22(1)(a)(ii)
Assistant Director
Mining Section
Approvals & Wildlife
Dept of the Environment, Water, Heritage & the Arts

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

Email: lucy.butterfield@environment.gov.au

From: s. 47F(1) n@arrowenergy.com.au]
Sent: Tuesday, 9 March 2010 4:22 PM
To: Barker, James
Cc: s. 22(1)(a)(ii)
Subject: RE: Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344) [SEC=UNCLASSIFIED]

James

Thank you for taking to the time to speak with me. Further to our conversation, can you please confirm the statutory decision dates for these referrals ? I understand DEWHA stopped the clock when you requested further information, however am unsure when the clock formerly restarted. Our estimate was the 10th or 11th March 2010 and I would like to confirm with Arrow management what the expected timeframe for this decision is.

Thanks for your assistance.

Please call me on s. 47F(1) if you would like to discuss.

Cheers,

s. 47F(1)

From: Barker, James [mailto:James.Barker@environment.gov.au]
Sent: Friday, 19 February 2010 2:09 PM
To: s. 47F(1)
Cc: s. 47F(1) s. 22(1)(a)(ii)
Subject: RE: Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344) [SEC=UNCLASSIFIED]

Hi s. 47F(1)

Thanks for sending us the draft letter, and for our meeting, which we found very useful. On the basis of that further information in the draft letter, we will continue to progress these as 2 referrals, as originally submitted. I'd also be grateful if you could send that letter to us as a final.

We'll proceed to consider the two referrals in detail and will get back to you if we need further information.

Regards
James

James Barker
Director, Mining
Environment Assessment Branch
Approvals and Wildlife Division
ph: 02 6274 1933
fx: 02 6274 1789
email: james.barker@environment.gov.au

From: s. 47F(1) @arrowenergy.com.au]
Sent: Thursday, 18 February 2010 4:11 PM
To: Barker, James
Cc: s. 47F(1) ; s. 22(1)(a)(ii)
Subject: Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344)

James

Thank you for the time you and your team spent meeting with Arrow Energy on Monday 15 February 2010 to discuss the Dalby Expansion Project and the Surat Gas Project.

Further to our meeting and your letter dated 8 February 2010, Arrow has prepared a draft response to your request for information. A copy of the draft response is attached for your review prior to Arrow finalising and formerly submitting to DEWHA. I look forward to receiving any comments, questions or feedback you may have regarding the response.

Should you require any further information Arrow would be happy to discuss and provide this information.

Thank you for taking the time to review this correspondence.

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

From: s. 22(1)(a)(ii)
Sent: Friday, 26 February 2010 3:06 PM
To: s. 22(1)(a)(ii)
Subject: FW: Surat Gas Project 2010/5344 [SEC=UNCLASSIFIED]

Categories: UNCLASSIFIED

For File
Thanks

s. 22(1)(a)(ii)
Assistant Director
Mining Section
Approvals & Wildlife
Dept of the Environment, Water, Heritage & the Arts ph s. 22(1)(a)(ii) Fax s. 22(1)(a)(ii)
Email: s. 22(1)(a)(ii) @environment.gov.au

-----Original Message-----
From: Barker, James
Sent: Friday, 26 February 2010 2:49 PM
To: s. 47F(1)
Cc: s. 22(1)(a)(ii)
Subject: RE: Surat Gas Project 2010/5344 [SEC=UNCLASSIFIED]

Thanks s. 47F(1)

s. 47F(1) called me about this referral earlier today, and mentioned that he had discussed it with you yesterday.

I've had a look at Schedule 1 to your Regulations, as it relates to s.37(1)(e) of your Act. This referral does not however look materially different from others we have had, in relation to the degree of specificity of e.g. the location of pads within the overall field. So I agree that we should be able, if a CA decision is relevantly made, to progress the assessment under the bilateral.

As you're aware, we're currently proceeding to prepare documentation for a decision about whether this referral (and another one submitted at the same time by the proponent for the expansion of their Dalby field) trigger the EPBC Act.

Happy to discuss further.

Regards

James Barker
Director, Mining
Environment Assessment Branch
Approvals and Wildlife Division
ph: 02 6274 1933
fx: 02 6274 1789
email: james.barker@environment.gov.au

-----Original Message-----
From: s. 47F(1) @derm.qld.gov.au]
Sent: Wednesday, 24 February 2010 3:45 PM
To: Barker, James
Subject: RE: Surat Gas Project 2010/5344

James

Further to our discussion this morning, I have had advice from the project proponent that they consider the risks associated with proceeding with the assessment of the project under an EIS accredited by DEWHA or under the bilateral, are low. They are seeking further legal advice this afternoon.

Should this be the case, we are looking at how to proceed with the EIS while taking into consideration that DEWHA has not yet made a decision regarding the controlled action status of the project or the method of assessment.

I will give you a call to discuss.

Regards

s. 47F(1)

Environmental Services
Department of Environment and Resource Management Level 7, 400 George St
BRISBANE 4001
PO Box 15155
CITY EAST QLD 4002

Email: s. 47F(1) @derm.qld.gov.au
Phone: s. 47F(1)

-----Original Message-----
From: s. 47F(1)
Sent: Tuesday, 23 February 2010 4:56 PM
To: 'james.barker@environment.gov.au'
Subject: Surat Gas Project 2010/5344

James

I am the project manager for the EIS in DERM for the SGP.

I spoke with s. 22(1)(a)(ii) earlier today regarding an aspect of the assessment of the project by EIS under Queensland's Environmental Protection Act 1994. I refer to Chapter 2 of the Environmental Protection Regulation 2008 which supports the Act. This chapter refers to a Schedule 1 in the Reg which comes into play for projects assessed by EIS under the Cwth - Qld bilateral agreement.

Basically, Schedule 1 sets out some very prescriptive requirements the EIS would need to meet. Arrow Energy, proponent for the SGP propose to produce a 'risk and constraints based' EIS. From your understanding of the approach to be taken by Arrow in preparing the EIS, I would appreciate your views on whether the EIS is likely to meet the requirements of Schedule 1. It is better that this be considered now before the TOR are advertised.

I will try to call you tomorrow to discuss.

Regards

s. 47F(1)

Environmental Services
Department of Environment and Resource Management Level 7, 400 George St
BRISBANE 4001
PO Box 15155
CITY EAST QLD 4002

Email: s. 47F(1) @derm.qld.gov.au
Phone: s. 47F(1)

As of 26 March 2009 the Department of Natural Resources and Water/Environmental Protection Agency integrated to form the Department of Environment and Resource Management

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

From: Barker, James
Sent: Friday, 19 February 2010 4:46 PM
To: s. 22(1)(a)(ii)
Cc: s. 22(1)(a)(ii)
Subject: RE: Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344) [SEC=UNCLASSIFIED]
Categories: UNCLASSIFIED

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

s. 47F(1) called me just now. He wanted to confirm what I said below. I confirmed that the info in their draft letter would be sufficient for us to proceed on the basis of Dalby and Surat being separate.

He also wanted to check about allowing for assessment of Surat under the bilateral. The State is proceeding with an EIS, but they are required to finalise TOR for this before the due date for the EPBC CA decision which he said was due on 10 March. I said that if we had an opportunity to comment informally on the TOR, and the TOR allowed for assessment against NES matters (there would need to be some flexibility in advance of confirming which nes matters applied), then would should be able to accredit the Qld process.

I also mentioned that, if the information in their letter is correct (and we are yet to give a detailed consideration of the referral), and if NCA is a feasible option, we may prefer to go down the NCA-PM road. But we aren't in a position to judge this yet.

Thanks
j

From: Barker, James
Sent: Friday, 19 February 2010 3:09 PM
To: s. 47F(1)
Cc: s. 47F(1) s. 22(1)(a)(ii)
Subject: RE: Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344) [SEC=UNCLASSIFIED]

Hi s. 47F(1)

Thanks for sending us the draft letter, and for our meeting, which we found very useful. On the basis of that further information in the draft letter, we will continue to progress these as 2 referrals, as originally submitted. I'd also be grateful if you could send that letter to us as a final.

We'll proceed to consider the two referrals in detail and will get back to you if we need further information.

Regards
James

James Barker
Director, Mining
Environment Assessment Branch
Approvals and Wildlife Division
ph: 02 6274 1933
fx: 02 6274 1789
email: james.barker@environment.gov.au

From: s. 47F(1) @arrowenergy.com.au]
Sent: Thursday, 18 February 2010 4:11 PM
To: Barker, James
Cc: s. 47F(1) ; s. 22(1)(a)(ii)
Subject: Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344)

James

Thank you for the time you and your team spent meeting with Arrow Energy on Monday 15 February 2010 to discuss the Dalby Expansion Project and the Surat Gas Project.

Further to our meeting and your letter dated 8 February 2010, Arrow has prepared a draft response to your request for information. A copy of the draft response is attached for your review prior to Arrow finalising and formerly submitting to DEWHA. I look forward to receiving any comments, questions or feedback you may have regarding the response.

Should you require any further information Arrow would be happy to discuss and provide this information.

Thank you for taking the time to review this correspondence.

Please contact me on s. 47F(1) should you have any queries or would like to discuss in more detail.

Regards,

s. 47F(1)
EIS Project Director

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

From: Barker, James
Sent: Friday, 19 February 2010 3:09 PM
To: s. 47F(1)
Cc: s. 47F(1) s. 22(1)(a)(ii)
Subject: RE: Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344) [SEC=UNCLASSIFIED]
Categories: UNCLASSIFIED

Hi s. 47F(1)

Thanks for sending us the draft letter, and for our meeting, which we found very useful. On the basis of that further information in the draft letter, we will continue to progress these as 2 referrals, as originally submitted. I'd also be grateful if you could send that letter to us as a final.

We'll proceed to consider the two referrals in detail and will get back to you if we need further information.

Regards
James

James Barker
Director, Mining
Environment Assessment Branch
Approvals and Wildlife Division
ph: 02 6274 1933
fx: 02 6274 1789
email: james.barker@environment.gov.au

From: s. 47F(1) @arrowenergy.com.au]
Sent: Thursday, 18 February 2010 4:11 PM
To: Barker, James
Cc: s. 47F(1) s. 22(1)(a)(ii)
Subject: Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344)

James

Thank you for the time you and your team spent meeting with Arrow Energy on Monday 15 February 2010 to discuss the Dalby Expansion Project and the Surat Gas Project.

Further to our meeting and your letter dated 8 February 2010, Arrow has prepared a draft response to your request for information. A copy of the draft response is attached for your review prior to Arrow finalising and formerly submitting to DEWHA. I look forward to receiving any comments, questions or feedback you may have regarding the response.

Should you require any further information Arrow would be happy to discuss and provide this information.

Thank you for taking the time to review this correspondence.

Please contact me on s. 47F(1) should you have any queries or would like to discuss in more detail.

Regards,

s. 47F(1)
EIS Project Director

arrow energy
go further

19 February 2010

Ref: ENV10-024

Mr James Barker
Mining Section
Environmental Assessment Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

Dear Mr Barker

Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344)

Thank you for your letter dated 8 February 2010, requesting additional information on why the Dalby Expansion Project and the Surat Gas Project for which referrals have been submitted should not be considered parts of a larger action pursuant to Section 74A(1) of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Dalby Expansion Project is a continuation of Arrow's existing activities in the areas west and south of Dalby. It involves expansion of existing gas production facilities, namely gas wells, gas compression, power generation and water treatment facilities to enable full development of the targeted coal seam gas fields. The Dalby Expansion Project will proceed independently and irrespective of whether the Surat Gas Project proceeds, as its purpose is to fulfil domestic gas supply agreements and inform our understanding of the performance of the gas reservoir.

Arrow's existing facilities have not previously been referred as they have not impacted on Matters of National Environmental Significance (MNES).

The proposed Dalby Expansion Project has been referred because its activities are within proximity to EPBC Act listed vegetation communities, however the scope of expansion activities are well defined with known locations for all facilities and extensive studies and mapping of all areas of environmental significance. Arrow considered it prudent to submit a referral for this development to ensure transparency in relation to our current activities and to demonstrate that avoidance of any potential impacts on MNES is achievable. The referral has demonstrated that infrastructure can be sited to avoid MNES and consequently Arrow has nominated the proposed activities of the Dalby Expansion Project as 'not a controlled action'.

The activities within the Dalby Expansion Project are clearly defined , and the majority of the activities are already approved under 'environmental authorities' issued by the Queensland Department of Environment and Resource Management.

In contrast, the Surat Gas Project is primarily proposed to supply coal seam gas to proposed export LNG projects at Gladstone. New integrated production facilities (featuring gas compression, power generation and water treatment), gas wells and gathering systems will be developed throughout the project area (some 8,000 km^2), which includes the geographic area covered by the Dalby Expansion Project. However, facilities contemplated in the Surat Gas Project exclude the scope of activities proposed in the Dalby Expansion Project.

The Surat Gas Project is currently at an early stage of development planning and as such, the uncertainty about the proposed location of coal seam gas infrastructure warrants the Surat Gas Project being subject to an environmental impact assessment. Arrow has consequently volunteered to prepare an Environmental Impact Statement under the *Environmental Protection Act 1994* (Qld) and has nominated the proposed action a 'controlled action' under the EPBC Act with an expectation that the Queensland assessment process would be endorsed as the appropriate level of assessment.

Therefore, a single referral covering the Dalby Expansion and Surat Gas projects would not be appropriate in this instance for the following reasons:

- The specific activities proposed in the Dalby Expansion Project are separate activities to those contemplated in the Surat Gas Project, even though they may occur in the same geographic area.
- The Dalby Expansion Project will proceed regardless of whether the Surat Gas Project proceeds and therefore it is appropriate for it to be considered a separate project and assessed independently.
- An assessment of environmental impacts associated with the Dalby Expansion Project has been undertaken and Arrow has demonstrated in the referral that MNES have been avoided.

In addition, a requirement to address potential impacts of both projects in a single assessment process (the result of submitting a single referral covering both projects) would result in a moratorium on coal seam gas development required to fulfil existing domestic gas agreements. It would put at risk fulfilment of existing contracts.

Given the potential impact on Arrow's current activities, it would be appreciated if you would consult with Arrow on any further information required to inform your assessment of whether Section 74A(1) applies in this instance before making a decision.

Please contact me by phone on s. 47F(1) or email s. 47F(1)@arrowenergy.com.au or s. 47F(1) on s. 47F(1) or email s. 47F(1)@arrowenergy.com.au if you require any further information.

Regards,

s. 47F(1)
Environment Manager

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

From: s. 47F(1) @arrowenergy.com.au]
Sent: Friday, 19 February 2010 6:08 PM
To: Barker, James
Cc: s. 47F(1) ; s. 22(1)(a)(ii) a
Subject: RE: Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344) [SEC=UNCLASSIFIED]
Attachments: 100219_DEWHA_ENV10-024_Rev 1_Response Info Request.pdf

James

Thank you for your prompt review of our Draft letter.

Please find attached a copy of the finalised letter for your information. The original has been forwarded by regular mail.

Should you require any further information Arrow would be happy to discuss and provide this information.

Thank you for taking the time to review this correspondence.

Please contact me on s. 47F(1) should you have any queries or would like to discuss in more detail.

Regards,

s. 47F(1)
EIS Project Director

From: Barker, James [mailto:James.Barker@environment.gov.au]
Sent: Friday, 19 February 2010 2:09 PM
To: s. 47F(1)
Cc: s. 47F(1) s. 22(1)(a)(ii)
Subject: RE: Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344) [SEC=UNCLASSIFIED]

Hi s. 47F(1)

Thanks for sending us the draft letter, and for our meeting, which we found very useful. On the basis of that further information in the draft letter, we will continue to progress these as 2 referrals, as originally submitted. I'd also be grateful if you could send that letter to us as a final.

We'll proceed to consider the two referrals in detail and will get back to you if we need further information.

Regards
James

James Barker
Director, Mining
Environment Assessment Branch
Approvals and Wildlife Division
ph: 02 6274 1933
fx: 02 6274 1789
email: james.barker@environment.gov.au

From: s. 47F(1) @arrowenergy.com.au]

Sent: Thursday, 18 February 2010 4:11 PM
To: Barker, James
Cc: s. 47F(1) s. 22(1)(a)(ii)
Subject: Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344)

James

Thank you for the time you and your team spent meeting with Arrow Energy on Monday 15 February 2010 to discuss the Dalby Expansion Project and the Surat Gas Project.

Further to our meeting and your letter dated 8 February 2010, Arrow has prepared a draft response to your request for information. A copy of the draft response is attached for your review prior to Arrow finalising and formerly submitting to DEWHA. I look forward to receiving any comments, questions or feedback you may have regarding the response.

Should you require any further information Arrow would be happy to discuss and provide this information.

Thank you for taking the time to review this correspondence.

Please contact me on s. 47F(1) should you have any queries or would like to discuss in more detail.

Regards,

s. 47F(1)
EIS Project Director

---

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

From: Barker, James
Sent: Friday, 19 February 2010 4:46 PM
To: s. 22(1)(a)(ii)
Cc:
Subject: RE: Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344) [SEC=UNCLASSIFIED]
Categories: UNCLASSIFIED

s. 22(1)(a)(ii) - for file.

s. 47F(1) called me just now. He wanted to confirm what I said below. I confirmed that the info in their draft letter would be sufficient for us to proceed on the basis of Dalby and Surat being separate.

He also wanted to check about allowing for assessment of Surat under the bilateral. The State is proceeding with an EIS, but they are required to finalise TOR for this before the due date for the EPBC CA decision which he said was due on 10 March. I said that if we had an opportunity to comment informally on the TOR, and the TOR allowed for assessment against NES matters (there would need to be some flexibility in advance of confirming which nes matters applied), then would should be able to accredit the Qld process.

I also mentioned that, if the information in their letter is correct (and we are yet to give a detailed consideration of the referral), and if NCA is a feasible option, we may prefer to go down the NCA-PM road. But we aren't in a position to judge this yet.

Thanks
j

From: Barker, James
Sent: Friday, 19 February 2010 3:09 PM
To: s. 47F(1)
Cc: s. 47F(1) s. 22(1)(a)(ii)
Subject: RE: Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344) [SEC=UNCLASSIFIED]

Hi s. 47F(1)

Thanks for sending us the draft letter, and for our meeting, which we found very useful. On the basis of that further information in the draft letter, we will continue to progress these as 2 referrals, as originally submitted. I'd also be grateful if you could send that letter to us as a final.

We'll proceed to consider the two referrals in detail and will get back to you if we need further information.

Regards
James

James Barker
Director, Mining
Environment Assessment Branch
Approvals and Wildlife Division
ph: 02 6274 1933
fx: 02 6274 1789
email: james.barker@environment.gov.au

From: s. 47F(1) @arrowenergy.com.au]
Sent: Thursday, 18 February 2010 4:11 PM
To: Barker, James
Cc: s. 47F(1) s. 22(1)(a)(ii)
Subject: Dalby Expansion Project (EPBC 2010/5343) and Surat Gas Project (EPBC 2010/5344)

James

Thank you for the time you and your team spent meeting with Arrow Energy on Monday 15 February 2010 to discuss the Dalby Expansion Project and the Surat Gas Project.

Further to our meeting and your letter dated 8 February 2010, Arrow has prepared a draft response to your request for information. A copy of the draft response is attached for your review prior to Arrow finalising and formerly submitting to DEWHA. I look forward to receiving any comments, questions or feedback you may have regarding the response.

Should you require any further information Arrow would be happy to discuss and provide this information.

Thank you for taking the time to review this correspondence.

Please contact me on s. 47F(1) should you have any queries or would like to discuss in more detail.

Regards,

s. 47F(1)
EIS Project Director

Australian Government
Department of the Environment, Water, Heritage and the Arts

Protected Matters Search Tool

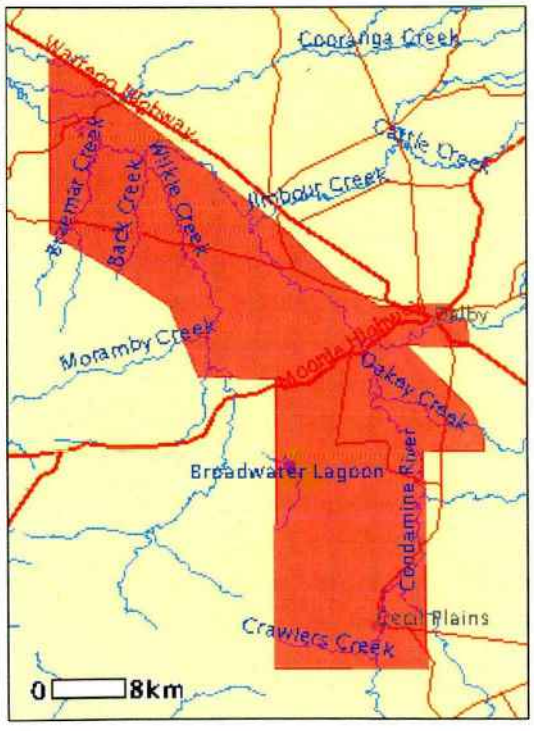
4 February 2010 10:57

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. Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

You may wish to print this report for reference before moving to other pages or websites.

The Australian Natural Resources Atlas at http://www.environment.gov.au/atlas may provide further environmental information relevant to your selected area. Information about the EPBC Act including significance guidelines, forms and application process details can be found at http://www.environment.gov.au/epbc/assessmentsapprovals/index.html



Search Type: Area

Buffer: 2 km

Coordinates: -26.879565881,150.848562713, -27.081516541,151.100011084, -27.13299416,151.150498749, -27.166652604,151.200986414, -27.164672695,151.28216266, -27.181501917,151.284142568, -27.182491871,151.299981836, -27.214170406,151.301961744, -27.211200543,151.229695087, -27.281487293,151.301961744, -27.315145736,151.317801012, -27.333954866,151.318790966, -27.332964912,151.249494171, -27.58144342,151.252464034, -27.583423329,151.083181862, -27.250798712,151.084171817, -27.246838895,150.999035754, -27.166652604,150.968347173, -27.132004206,150.917859508, -27.081516541,150.834703354, -26.883525698,150.835693308

Report Contents:

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Significance: (Ramsar Sites)	1
Commonwealth Marine Areas:	None

Threatened Ecological Communities:	4
Threatened Species:	25
Migratory Species:	18

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage/index.html.

Please note that the current dataset on Commonwealth land is not complete. Further information on Commonwealth land would need to be obtained from relevant sources including Commonwealth agencies, local agencies, and land tenure maps.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at http://www.environment.gov.au/epbc/permits/index.html.

Commonwealth Lands:	1
Commonwealth Heritage Places:	None
Places on the RNE:	1
Listed Marine Species:	19
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

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

State and Territory Reserves:	2
Other Commonwealth Reserves:	None
Regional Forest Agreements:	None

Details

Matters of National Environmental Significance

Wetlands of International Significance [Dataset Information] (Ramsar Sites)		
NARRAN LAKE NATURE RESERVE		Within same catchment as Ramsar site
Threatened Ecological Communities [Dataset Information]	**Status**	**Type of Presence**
Brigalow (*Acacia harpophylla* dominant and co-dominant)	Endangered	Community known to occur within area
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	Critically Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area
Threatened Species [Dataset Information]	**Status**	**Type of Presence**
Birds		
Anthochaera phrygia Regent Honeyeater	Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern)	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot	Endangered	Species or species habitat may occur within area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern)	Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe	Vulnerable	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat	Vulnerable	Species or species habitat may occur within area
Dasyurus hallucatus Northern Quoll	Endangered	Species or species habitat may occur within area
Nyctophilus timoriensis (South-eastern form) Greater Long-eared Bat	Vulnerable	Species or species habitat may occur within area
Ray-finned fishes		
Maccullochella peelii peelii Murray Cod, Cod, Goodoo	Vulnerable	Species or species habitat may occur within area

Reptiles

Anomalopus mackayi Five-clawed Worm-skink, Long-legged Worm-skink	Vulnerable	Species or species habitat may occur within area
Delma torquata Collared Delma	Vulnerable	Species or species habitat may occur within area
Furina dunmalli Dunmall's Snake	Vulnerable	Species or species habitat may occur within area
Tympanocryptis pinguicolla Grassland Earless Dragon	Endangered	Species or species habitat may occur within area

Plants

Acacia chinchillensis	Vulnerable	Species or species habitat likely to occur within area
Cadellia pentastylis Ooline	Vulnerable	Species or species habitat likely to occur within area
Dichanthium queenslandicum King Blue-grass	Vulnerable	Species or species habitat likely to occur within area
Digitaria porrecta Finger Panic Grass	Endangered	Species or species habitat likely to occur within area
Diuris sheaffiana Tricolour Diuris	Vulnerable	Species or species habitat may occur within area
Homopholis belsonii	Vulnerable	Species or species habitat may occur within area
Philotheca sporadica	Vulnerable	Species or species habitat likely to occur within area
Picris evae Hawkweed	Vulnerable	Species or species habitat likely to occur within area
Rhaponticum australe Austral Cornflower, Native Thistle	Vulnerable	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax	Vulnerable	Species or species habitat likely to occur within area
Tylophora linearis	Endangered	Species or species habitat may occur within area

Migratory Species [Dataset Information]	Status	Type of Presence
Migratory Terrestrial Species		
Birds		
Haliaeetus leucogaster White-bellied Sea-Eagle	Migratory	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail	Migratory	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater	Migratory	Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail	Migratory	Breeding may occur within area

Xanthomyza phrygia Regent Honeyeater	Migratory	Species or species habitat may occur within area
Migratory Wetland Species		
Birds		
Ardea alba Great Egret, White Egret	Migratory	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper	Migratory	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper	Migratory	Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe	Migratory	Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit	Migratory	Species or species habitat known to occur within area
Nettapus coromandelianus albipennis Australian Cotton Pygmy-goose	Migratory	Species or species habitat may occur within area
Rostratula benghalensis s. lat. Painted Snipe	Migratory	Species or species habitat may occur within area
Tringa glareola Wood Sandpiper	Migratory	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank	Migratory	Species or species habitat known to occur within area
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift	Migratory	Species or species habitat may occur within area
Ardea alba Great Egret, White Egret	Migratory	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Dataset Information]	Status	Type of Presence
Birds		
Anseranas semipalmata Magpie Goose	Listed - overfly marine area	Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift	Listed - overfly marine area	Species or species habitat may occur within area

Ardea alba Great Egret, White Egret	Listed - overfly marine area	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Listed - overfly marine area	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper	Listed	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper	Listed - overfly marine area	Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe	Listed - overfly marine area	Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle	Listed	Species or species habitat likely to occur within area
Himantopus himantopus Black-winged Stilt	Listed - overfly marine area	Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail	Listed - overfly marine area	Species or species habitat may occur within area
Lathamus discolor Swift Parrot	Listed - overfly marine area	Species or species habitat may occur within area
Limosa limosa Black-tailed Godwit	Listed - overfly marine area	Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater	Listed - overfly marine area	Species or species habitat may occur within area
Nettapus coromandelianus albipennis Australian Cotton Pygmy-goose	Listed - overfly marine area	Species or species habitat may occur within area
Recurvirostra novaehollandiae Red-necked Avocet	Listed - overfly marine area	Species or species habitat known to occur within area

Rhipidura rufifrons Rufous Fantail	Listed - overfly marine area	Breeding may occur within area
Rostratula benghalensis s. lat. Painted Snipe	Listed - overfly marine area	Species or species habitat may occur within area
Tringa glareola Wood Sandpiper	Listed - overfly marine area	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank	Listed - overfly marine area	Species or species habitat known to occur within area

Commonwealth Lands [Dataset Information]

Defence

Places on the RNE [Dataset Information]
Note that not all Indigenous sites may be listed.

Historic

Dalby War Memorial and Memorial Park QLD

Extra Information

State and Territory Reserves [Dataset Information]

Lake Broadwater Conservation Park, QLD

Lake Broadwater Resource Reserve, QLD

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 Heritage and Register of National Estate properties, Wetlands of International 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.

Only selected species covered by the migratory and marine provisions of the Act have been mapped.

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.

Acknowledgments

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

- New South Wales National Parks and Wildlife Service
- Department of Sustainability and Environment, Victoria
- Department of Primary Industries, Water and Environment, Tasmania
- Department of Environment and Heritage, South Australia Planning SA
- Parks and Wildlife Commission of the Northern Territory
- Environmental Protection Agency, Queensland
- Birds Australia
- Australian Bird and Bat Banding Scheme
- Australian National Wildlife Collection
- Natural history museums of Australia
- Queensland Herbarium
- National Herbarium of NSW
- Royal Botanic Gardens and National Herbarium of Victoria
- Tasmanian Herbarium
- State Herbarium of South Australia
- Northern Territory Herbarium
- Western Australian Herbarium

- Australian National Herbarium, Atherton and Canberra
- University of New England
- Other groups and individuals

ANUCliM Version 1.8, Centre for Resource and Environmental Studies, Australian National University was used extensively for the production of draft maps of species distribution. Environment Australia is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Top | About us | Advanced search | Contact us | Information services | Publications | Site index | What's new

Accessibility | Disclaimer | Privacy | © Commonwealth of Australia 2004

Last updated: Thursday, 20-Nov-2008 14:17:56 EST

Department of the Environment, Water, Heritage and the Arts
GPO Box 787 Canberra ACT 2601 Australia
Telephone: +61 (0)2 6274 1111

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

From: s. 22(1)(a)(ii)
Sent: Thursday, 11 February 2010 11:11 AM
To: s. 47F(1)@arrowenergy.com.au'; s. 47F(1) @coffey.com'
Cc: s. 22(1)(a)(ii)
Subject: FW: Dalby Gas Expansion (2010/5343) and Surat Gas Expansion (EPBC 2010/5344) Projects [SEC=UNCLASSIFIED]

Categories: UNCLASSIFIED
Attachments: Request information .pdf

Hi s. 47F(1)
Further to my email below I wish to advise that we have stopped the clock on your referral due date. The clock will recommence on receipt of the requested information. I apologise for the inconvenience.
Regards,

s. 22(1)(a)(ii) | Assessment Officer
Department of the Environment, Water, Heritage and the Arts | GPO Box 787 CANBERRA, ACT 2601
s. 22(1)(a)(ii) @environment.gov.au
Please consider our environment before printing this e-mail.

From: s. 22(1)(a)(ii)
Sent: Monday, 8 February 2010 9:25 AM
To: s. 47F(1)@arrowenergy.com.au'; s. 47F(1) @coffey.com'
Cc: s. 22(1)(a)(ii)
Subject: Dalby Gas Expansion (2010/5343) and Surat Gas Expansion (EPBC 2010/5344) Projects [SEC=UNCLASSIFIED]

Dear s. 47F(1)
Please see attached letter requesting further information (noting that at this stage we have not stopped the clock on the referral process).

Regards,

Request
mation .pdf (3

s. 22(1)(a)(ii) | Assessment Officer
Department of the Environment, Water, Heritage and the Arts | GPO Box 787 CANBERRA, ACT 2601
s. 22(1)(a)(ii) @environment.gov.au
Please consider our environment before printing this e-mail.

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

From: s. 22(1)(a)(ii)
Sent: Monday, 8 February 2010 2:45 PM
To: s. 47F(1)
Cc: s. 47F(1)
Subject: Invitation to comment on Referral - (EPBC 2010/5343) [SEC=UNCLASSIFIED]

Categories: UNCLASSIFIED
Attachments: 2010-5343 Invite comments - Defence.pdf

Hi s. 47F(1)
Please see attached link to a referral received for consideration under the EPBC Act for your comment, as it falls within your area of interest: http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=referral_detail&proposal_id=5343

Please note that the correct EPBC No is 2010/5343 and not 2010/5344 as stated at the top of the attached letter (my apologies).

Any comment should be forwarded by 22 February 2010 via:
Fax s. 22(1)(a)(ii) or e-mail to s. 22(1)(a)(ii)@environment.gov.au.

Formal notification has been sent in the postal mail.

Regards,

2010-5343
e comments -

s. 22(1)(a)(ii) | Assessment Officer
Department of the Environment, Water, Heritage and the Arts | GPO Box 787 CANBERRA, ACT 2601
s. 22(1)(a)(ii) @environment.gov.au

Please consider our environment before printing this e-mail.

Australian Government

Department of the Environment, Water, Heritage and the Arts

Mr Terry Weston
Assistant Secretary
Estate Policy and Environment Branch
Infrastructure Division
Department of Defence
Brindabella Park (BP3-2-B001)
Canberra ACT 2600

Date: 8 February 2010
EPBC Ref: 2010/5343
EPBC contact: s. 22(1)(a)(ii)
s. 22(1)(a)(ii) @environment.gov.au

Dear Mr Weston

Invitation to comment on referral
Dalby Expansion Project, Qld

I am writing to you, as the delegated contact for Minister Faulkner, in relation to consultation on actions being assessed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

We have received a referral of a proposed action from Arrow Energy to increase the production capacity of the Surat Basin operations through the initial development of gas fields and expansion of existing gas fields near Dalby, Queensland, for consideration under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

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

As a delegate of the Minister for the Environment, Heritage and the Arts, I 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 timeframes set out in the EPBC Act, we need to receive your response by 22 February 2010. 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 us:

by letter
Mining Section
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

by email s. 22(1)(a)(ii) @environment.gov.au
by fax s. 22(1)(a)(ii)

If you have any questions about this process, please contact s. 22(1)(a)(ii) and quote EPBC No 2010/5343.

Yours sincerely

s. 47F(1)

James Barker
Director
Mining Section
Environment Assessment Branch

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

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

From:
Sent: Monday, 8 February 2010 9:25 AM
To: 's. 47F(1)@arrowenergy.com.au'; s. 47F(1) @coffey.com'
Cc: s. 22(1)(a)(ii)
Subject: Dalby Gas Expansion (2010/5343) and Surat Gas Expansion (EPBC 2010/5344) Projects [SEC=UNCLASSIFIED]

Categories: UNCLASSIFIED
Attachments: Request information .pdf

Dear s. 47F(1)
Please see attached letter requesting further information (noting that at this stage we have not stopped the clock on the referral process).

Regards,

Request
mation .pdf (3

s. 22(1)(a)(ii) | Assessment Officer
Department of the Environment, Water, Heritage and the Arts | GPO Box 787 CANBERRA, ACT 2601
s. 22(1)(a)(ii) @environment.gov.au

Please consider our environment before printing this e-mail.

Australian Government

Department of the Environment, Water, Heritage and the Arts

s. 47F(1)
Environment Manager
Arrow Energy
Level 19, AM60
42-60 Albert St
Brisbane Qld 4000

Date: 8 February
EPBC Ref: 2010/5343 & 2010/5344
EPBC contact: James Barker
02 6274 1933
James.barker@environment.gov.au

Dear s. 47F(1)

Request for additional information
Dalby Gas Expansion Project (EPBC 2010/5343) and Surat Gas Expansion Project (EPBC 2010/5344).

Thank you for submitting two referrals under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) concerning the above proposed actions.

Our initial examination of your referrals indicates that these two projects are very closely related and could be assessed as single "action" under the EPBC Act.

Under section 74A(1), if the Minister receives a referral, and the Minister is satisfied the action that is the subject of the referral is a component of a larger action the person proposes to take, the Minister may decide to not accept the referral.

I am writing to ask you to provide further information as to the reasons why these two referrals should be considered as separate actions.

In any correspondence with the Department please quote the title of the action and EPBC reference, as shown on the beginning of this letter. You can send information to us:

by letter
Mining Section
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

by email James.Barker@environment.gov.au

We would appreciate your response by 17 February 2010 to allow us to progress your referrals expeditiously.

If you have any questions about the process please contact the EPBC project manager and quote the EPBC reference number shown at the beginning of this letter.

Yours sincerely

s. 47F(1)

Michelle Wicks
A/g Assistant Secretary
Environment Assessment Branch

Who should provide internal advice on this proposal?

Use this worksheet to determine which controlling provisions may apply and the DEW line area to be notified. Use the notes at the end of this worksheet and the following sources to determine if the notification rule applies:

referral
* cross out 'states' or 'implies' where relevant below

map search

protected matter search

Controlling provision notification rules *tick box if rule applies*		If rule applies, notify the area indicated below via RAD	email
World Heritage property (s.12 and s.15A)		☐ HMB	
Referral states/implies* that World Heritage is a protected matter	☐		
Proposed action is on World Heritage property	☐	No	
Proposed action is within a 5km boundary of World Heritage property	☐		
Proposed action is outside the property, but could have direct or indirect impact on the property	☐		
Proposed action could change access, land use or visitations	☐		
Proposed action could result in air emissions adversely affecting airsheds or viewsheds	☐		
World Heritage property identified	☐		
Proposed action is in GBRWHA	☐		☐ GBRMPA
National Heritage place (s.15B and s.15C)		☐ HMB	
Referral states/implies* that National Heritage is a protected matter	☐		
Proposed action is in National Heritage place	☐	No	
Proposed action is within a 1km boundary of National Heritage place	☐		
Proposed action could change access, land use or visitations	☐		
Proposed action could affect physical fabric or view sheds	☐		
Proposed action could affect Indigenous community	☐		
National Heritage place identified	☐		
Ramsar wetland (s.16 and s.17B)		☑ CWB	
Referral states/implies that Ramsar wetland is a protected matter	☑		
Proposed action is in Ramsar wetland area	☐	Yes	
Proposed action is within a 5km boundary of Ramsar wetland area	☐		
Proposed action is not Ramsar wetland area, but could have direct or indirect impact on Ramsar wetland area	☐		
Proposed action could change access, land use or visitations	☐		
Ramsar wetland identified	☑		
Listed threatened species and communities (s.16 and s.18A)		☑ AWD	
Referral states/implies* that listed species or communities is a protected matter	☐	section doing referral	
Proposed action could impact individuals, populations or habitat for listed species	☐		
Proposed action is of a nature that could impact individuals, populations or habitat for listed species	☐	Yes	
Proposed action involves clearing native vegetation or habitat and poses offsite risks	☐		
Species listed and proposed action could impact species	☑		

Controlling provision notification rules *tick box if rule applies*		If rule applies, notify the area indicated below via RAD	email
Listed migratory species (s.20 and s.20A)		☑ AWD section doing referral	
Referral state/implies* that listed species or communities is a protected matter	☐		
Proposed action could impact individuals, populations or habitat for listed species	☐		
Proposed action notified for Ramsar wetland	☐		
Proposed action in or near National Wetland	☐		
Proposed action near water feature	☐	Yes	
Proposed action may affect shoreline habitat	☐		
Proposed action may affect water flows	☐		
Species listed and proposed action could impact species	☑		
Nuclear actions (s.21 and S.22A)		☐ MES ☐ HMB?	No
Referral states/implies* that nuclear action is involved e.g. uranium mining, transport of fuel rods, nuclear waste			
Commonwealth marine environment (oil/gas) (s. 23 and s.24A)		☐ MES ☐ HMB	
Referral states/implies* marine environment is a protected matter	☐		
Proposed action involves oil or gas exploration or production and is in marine waters	☐		No
Proposed action is in or within 50km of Marine Protected Area	☐		☐ MPA
Marine Protected Area identified	☐		
Commonwealth marine environment (no oil/gas) (s. 23 and s.24A)		☐ HMB	
Referral states/implies* marine environment is a protected matter	☐		
Proposed action is in Commonwealth waters	☐		No
Proposed action is in or within 50km of Marine Protected Area	☐		☐ MPA
Proposed action is in State waters, coastal or land based but could impact the Commonwealth marine environment	☐		
Proposed action could change access, land use or visitations	☐		
Proposed action is near Christmas or Cocos Islands	☐		☐ Parks Australia
Marine Protected Area identified	☐		
Commonwealth action and Commonwealth land (s.26, s.27A and s.28)		☑ AWD relevant section based on sector	
Proposed action is by a Commonwealth Agency	☐		
Referral states/implies* Commonwealth land is a protected matter	☐		Defence land within 2km.
Proposed action is on or within 1km of Commonwealth land	☐		
Proposed action is within 50km of a Marine Protected Area	☐	☐ GTS if Govt action affecting Defence land ☐ HMB	☐ MPA
Proposed action is outside Commonwealth land but could impact upstream catchment or affect water flow or quality on Commonwealth land	☐		
Proposed action is outside Commonwealth land but could affect airshed on Commonwealth land	☐		
Proposed action could constrain current use of Commonwealth land	☐		
Proposed action could affect Kakadu, Uluru, Calperum, Christmas Island or Cocos Islands	☐		☐ Parks Australia
Proposed action has major implications for water quality	☐		☐ WQS

No. of RAD notifications								No. of email notifications			
HMB	CWB	MES	GTS	PMS	SNRS	UDTRS	REFS	GBRMPA	Parks A	MPA	WQS

Prepared by: _____ Checked by: _____

File completed worksheet on the relevant Referral File.

Notes

Number of notifications

In most cases, there will only be one DEW line area that needs to be notified of the proposal. Two or more line areas only need to be formally notified via RAD if the proposal involves:

- Nuclear action
- Commonwealth marine
- Commonwealth land
- Commonwealth action.

If Commonwealth action is notified, notification for Commonwealth marine and Commonwealth land (if relevant) are not required as Commonwealth action precludes the application of the other controlling provisions under the EPBC Act.

Rules which require judgement

In some cases it is easy to determine whether the rule applies e.g. the proposed action is or isn't in a 5km boundary of a World Heritage property. In other cases, you will need to use your judgement to determine whether the rule applies. Examples of the types of impacts that may be relevant to making these judgements are set out below.

Proposals that will clearly not affect potential habitat (e.g occurring within the built environment, of a minor nature, not involving clearing of native vegetation, impacts clearly confined to areas of no importance etc) do not need to be notified for listed species even if the protected matters search tools throws up a number of species. Whether to notify these more trivial proposals is a judgement call that should be made with your supervisor. Examples of 'non-significant proposals', and that are not likely to need notification for listed species, are provided in the various significance guidelines available at the DEW EPBC Act web site.

Controlling provisions	Examples
World Heritage National Heritage Ramsar wetlands Commonwealth marine Commonwealth land	The action is located in the upstream catchment and has the potential to cause hydrological and/or physico-chemical changes (e.g changes to run-off water quality or quantity, changes to chemical composition etc), for example: • major industrial plant (smelters, power stations, ports etc) with effluent discharge in upstream catchments • substantial dam or proposals involving intensive agriculture or irrigation, and/or water extraction in upstream catchments • mining • sewage treatment plant, abstraction of water, aquaculture, substantial clearing involving potential leaching of acid sulphate soils or erosion. The action could result in changes to access, land use or visitations (e.g road, airport, tourist facility or other infrastructure). The action could result in air emissions adversely affecting airsheds of World Heritage properties, Commonwealth marine or Commonwealth land (e.g large-scale industrial plant). The action could affect viewsheds for a National Heritage place (towers, roads, build structures or changes in flight routes).
Listed migratory species Listed threatened species (marine examples)	The action is sea-based, coastal based or land based and is of a nature such that marine environments could be impacted (see 1 above). Relevant impacts may include: • emissions to the marine, coastal, estuarine or river environments; • impacts of a potentially uncontrolled nature, potential changes to water quality, or affect on species that frequent marine areas.

BEP Process Checklist

This checklist is to be used in conjunction with the 'Environment Assessment Manual' as a Quality Assurance Checklist that all steps in the process have been completed. Tick the box when you have completed each step or if the step is not applicable enter 'N/A'.

BEP Officer	s. 22(1)(a)(ii)	EPBC No	2010/5343
Project Name	Dalby Expansion Project, Dalby, Qld		
Assessment Section	Mining	Referral Start Date	Entered: 02/02/10 Day 1: 03/02/10
Officer Allocated to	s. 22(1)(a)(ii)	Decision Due Date	02/03/10
		Referral Comments Due	16/02/10

1. Receive

1A Initiate processing			
✓	Checked if exemption or exclusion applies		
1B Is the Referral Valid?			
✓	Checked validity of referral	✓	ACN/ABN checked for validity
1C Is the proposed action part of a larger project?			
✓	Checked if part of a larger action		
1D Is the proposed action related to another action?			
✓	Checked if related to another action	✓	If 'WB' – relevant Compliance Team Leader notified & print RAD page for file
1E Establish administrative records			
✓	Record created in RAD	✓	Acknowledge receipt of referral letter posted, emailed & copies printed for file
✓	Electronic files established (T:\AWD\Branch Folders\EAB\Projects\[year of referral receipt]	✓	TRIM file requested
1F Invite comments			
✓	Referral posted on website & public notices page printed for file	✓	Letters inviting comment from Commonwealth Ministers posted & copy printed for file
✓	Letters inviting comment from State/Territory Ministers posted & copy printed for file	✓	Letters inviting comment from Commonwealth Ministers emailed to relevant contacts within the Ministers Department & copies printed for file
✓	Letters inviting comment from State/Territory Ministers emailed to relevant contacts within the Ministers Department & copies printed for file	✓	Letter inviting comment from the person proposing the action (where relevant) posted, emailed & copies printed for file
Transfer to Assessment Section			
✓	Director and contact person of Assessment Section Notified by email	✓	Hard copy documents forwarded to Assessment Section
✓	Referrals Tracking Sheet updated	✓	Checklist photocopied and added to BEP file

Signature of BEP Officer s. 22(1)(a)(ii) ***Date*** 03/02/10

Please ensure that all requirements are completed prior to sending through to the next stage in the process

File notes	
Date	

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

From: EPBC Referrals
Sent: Tuesday, 2 February 2010 16:46
To: 'epbc@ret.gov.au'
Cc: s. 47F(1) @ret.gov.au'; 's. 47F(1) @ret.gov.au'; 's. 47F(1) @ret.gov.au'; s. 47F(1) @ret.gov.au'; 's. 47F(1) @ret.gov.au'; s. 47F(1) @ret.gov.au'
Subject: Invitation to comment on Referral - (EPBC 2010/5343) [SEC=UNCLASSIFIED]

Categories: UNCLASSIFIED
Attachments: Invite Comment - Commonwealth Minister Ferguson.doc

Good afternoon

We are sending you the attached link to a referral received for consideration under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) for your comments, as it falls within your area of interest:
http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=5343

Any comment should be sent by 16 February 2010 via:
fax (02) 6274 1789 or e-mail james.barker@environment.gov.au

Formal notification has been sent in the postal mail.

Regards
s. 22(1)(a)(ii)
BEP, QLD Section
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts

Invite
nt - Commonwe

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

From: EPBC Referrals
Sent: Tuesday, 2 February 2010 16:45
To: 'dcc.coord@climatechange.gov.au'
Subject: Invitation to comment on Referral - (EPBC 2010/5343) [SEC=UNCLASSIFIED]

Categories: UNCLASSIFIED
Attachments: Invite Comment - Commonwealth Minister Wong.doc

Good afternoon

We are sending you the attached link to a referral received for consideration under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) for your comments, as it falls within your area of interest:
http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=5343

Any comment should be sent by 16 February 2010 via:
fax (02) 6274 1789 or e-mail james.barker@environment.gov.au

Formal notification has been sent in the postal mail.

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

BEP, QLD Section
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts

Invite
ent - Commonw

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

From: EPBC Referrals
Sent: Tuesday, 2 February 2010 16:45
To: 'epbc@epa.qld.gov.au'
Subject: Invitation to comment on Referral - (EPBC 2010/5343) [SEC=UNCLASSIFIED]

Categories: UNCLASSIFIED
Attachments: Invite comment - State Minister Jones.doc

Good afternoon

We are sending you the attached link to a referral received for consideration under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) for your comments, as it falls within your area of interest:
http://www.environment.gov.au/cgi-bin/epbc/epbc_ap.pl?name=current_referral_detail&proposal_id=5343

Any comment should be sent by 16 February 2010 via:
fax (02) 6274 1789 or e-mail james.barker@environment.gov.au

Formal notification has been sent in the postal mail.

Regards
s. 22(1)(a)(ii)
BEP, QLD Section
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts

Invite
ent - State Min

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

From: EPBC Referrals
Sent: Tuesday, 2 February 2010 16:42
To: s. 47F(1) @arrowenergy.com.au'
Cc: s. 47F(1) @coffey.com'; s. 47F(1)@arrowenergy.com.au'
Subject: Receipt of Referral - (EPBC 2010/5343) [SEC=UNCLASSIFIED]

Categories: UNCLASSIFIED
Attachments: Acknowledge receipt referral Collins.doc; Acknowledge receipt referral Rutter.doc

Dear s. 47F(1)

Thank you for submitting a referral under the EPBC Act for the above proposal.

A letter acknowledging receipt of the referral will also be sent via the postal mail.

Kind Regards

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

EP, QLD Section
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts

Acknowledge ceipt referral C

Acknowledge ceipt referral R.

Australian Government

Department of the Environment, Water, Heritage and the Arts

s. 47F(1)
Senior Consultant
Coffey Natural Systems
Level 21, 12 Creek Street
BRISBANE QLD 4000

Date: 2 February 2010
EPBC Ref: 2010/5343
EPBC contact: Mr James Barker
02 6274 1933
james.barker@environment.gov.au

Dear s. 47F(1)

Receipt of referral
Dalby Expansion Project, Qld

Thank you for referring a proposal on behalf of Arrow Energy to increase the production capacity of the Surat Basin operations through the initial development of gas fields and expansion of existing gas fields near Dalby, Queensland, for consideration under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Information about this proposed action has been published on the Department's website for public consultation. The period of consultation will extend for 10 business days.

At the end of the consultation period, the information included in the referral, along with any comments received, will be used to help decide whether this proposed action:

- is a controlled action (one that is likely to have a significant impact on matters protected under the EPBC Act and therefore needs to be assessed and approved by the Minister for the Environment, Heritage and the Arts before it can proceed), or
- is not a controlled action and may be undertaken but only as described in the referral, or
- does not require approval under the EPBC Act.

Alternatively, it may be decided, on the basis of the information in the referral that the action is clearly unacceptable (the referred action would have unacceptable impacts on matters protected under the EPBC Act and cannot proceed).

Before making a decision, we may contact you to clarify any details or to ask you for further information. By 2 March 2010 you should receive advice about your referral.

An electronic version of your referral can be viewed on the Department's website at www.environment.gov.au/epbc. This website also includes a range of other information about the process of assessment and decision-making under the EPBC Act.

Your referral has been allocated a unique reference number, EPBC 2010/5343. Please use this number in any communications with the Department as it will help ensure timely and efficient service. You can also use this number to locate any information about your project on the Department's website.

We will make every effort to ensure that the assessment of your proposed action is handled in a professional and helpful manner. A project manager for the next stage of the process has been appointed and will be happy to answer any questions you might have. You can contact Mr James Barker by telephone on 02 6274 1933 or by email at james.barker@environment.gov.au

Yours sincerely

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

A/g Director
Queensland Section
Environment Assessment Branch

Australian Government

Department of the Environment, Water, Heritage and the Arts

The Hon Martin Ferguson AM MP
Minister for Resources and Energy
Parliament House
CANBERRA ACT 2600

Date: 2 February 2010
EPBC Ref: 2010/5343
EPBC contact: Mr James Barker
02 6274 1933
james.barker@environment.gov.au

Dear Minister

Invitation to comment on referral
Dalby Expansion Project, Qld

We have received a referral of a proposed action from Arrow Energy to increase the production capacity of the Surat Basin operations through the initial development of gas fields and expansion of existing gas fields near Dalby, Queensland, for consideration under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

We are 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.

As a delegate of the Minister for the Environment, Heritage and the Arts, I 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 timeframes set out in the EPBC Act, we need to receive your response by 16 February 2010. 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
Mr James Barker
Director
Mining Section
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

by email james.barker@environment.gov.au
by fax (02) 6274 1789

If you have any questions about this process, please contact Mr James Barker and quote EPBC 2010/5343.

Yours sincerely

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

A/g Director
Queensland Section
Environment Assessment Branch

Australian Government

Department of the Environment, Water, Heritage and the Arts

Senator the Hon Penny Wong
Minister for Climate Change and Water

Attention:
Ms Helen Grinbergs
Assistant Secretary
Coordination and Frameworks Branch
Department of Climate Change
GPO Box 854
CANBERRA ACT 2601

Date: 2 February 2010
EPBC Ref: 2010/5343
EPBC contact: Mr James Barker
02 6274 1933
james.barker@environment.gov.au

Dear Minister

Invitation to comment on referral
Dalby Expansion Project, Qld

We have received a referral of a proposed action from Arrow Energy to increase the production capacity of the Surat Basin operations through the initial development of gas fields and expansion of existing gas fields near Dalby, Queensland, for consideration under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

We are 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.

As a delegate of the Minister for the Environment, Heritage and the Arts, I 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 timeframes set out in the EPBC Act, we need to receive your response by 16 February 2010. 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
Mr James Barker
Director
Mining Section
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

by email james.barker@environment.gov.au
by fax (02) 6274 1789

If you have any questions about this process, please contact Mr James Barker and quote EPBC 2010/5343.

Yours sincerely

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

A/g Director
Queensland Section
Environment Assessment Branch

Australian Government

Department of the Environment, Water, Heritage and the Arts

The Hon Kate Jones MP
Minister for Climate Change and Sustainability

Date: 2 February 2010
EPBC Ref: 2010/5343
EPBC contact: Mr James Barker
02 6274 1933
james.barker@environment.gov.au

Attention:
s. 47F(1)
Director Integrated Assessment
Environmental Operations Division
Department of Environment and Resource Management
PO Box 15155
CITY EAST QLD 4002

Dear Minister

Invitation to comment on referral
Dalby Expansion Project, Qld

We have received a referral of a proposed action from Arrow Energy to increase the production capacity of the Surat Basin operations through the initial development of gas fields and expansion of existing gas fields near Dalby, Queensland, for consideration under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

We are 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.

As a delegate of the Minister for the Environment, Heritage and the Arts, 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 addition, we would be grateful if you could provide the Department with your views on the assessment approach you believe is appropriate to assess the impacts of the project, in the event that it is determined to be a 'controlled action'.

In particular, we would appreciate your advice as to whether the proposal should be assessed at the Queensland state level, using one of the processes agreed under the bilateral agreement with the Commonwealth.

In accordance with the EPBC Act, we need to receive your response by 16 February 2010. 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
Mr James Barker
Director
Mining Section
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

by email james.barker@environment.gov.au
by fax (02) 6274 1789

If you have any questions about this process, please contact Mr James Barker and quote EPBC 2010/5343.

Yours sincerely

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

A/g Director
Queensland Section
Environment Assessment Branch

Australian Government

Department of the Environment, Water, Heritage and the Arts

s. 47F(1)
Environment Manager
Arrow Energy
Level 19, AM60
42-60 Albert Street
BRISBANE QLD 4000

Date: 2 February 2010
EPBC Ref: 2010/5343
EPBC contact: Mr James Barker
02 6274 1933
james.barker@environment.gov.au

Dear s. 47F(1)

Receipt of referral
Dalby Expansion Project, Qld

Thank you for referring your proposal to increase the production capacity of the Surat Basin operations through the initial development of gas fields and expansion of existing gas fields near Dalby, Queensland, for consideration under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Information about this proposed action has been published on the Department's website for public consultation. The period of consultation will extend for 10 business days.

At the end of the consultation period, the information included in the referral, along with any comments received, will be used to help decide whether this proposed action:

- is a controlled action (one that is likely to have a significant impact on matters protected under the EPBC Act and therefore needs to be assessed and approved by the Minister for the Environment, Heritage and the Arts before it can proceed), or
- is not a controlled action and may be undertaken but only as described in the referral, or
- does not require approval under the EPBC Act.

Alternatively, it may be decided, on the basis of the information in the referral that the action is clearly unacceptable (the referred action would have unacceptable impacts on matters protected under the EPBC Act and cannot proceed).

Before making a decision, we may contact you to clarify any details or to ask you for further information. By 2 March 2010 you should receive advice about your referral.

An electronic version of your referral can be viewed on the Department's website at www.environment.gov.au/epbc. This website also includes a range of other information about the process of assessment and decision-making under the EPBC Act.

Your referral has been allocated a unique reference number, EPBC 2010/5343. Please use this number in any communications with the Department as it will help ensure timely and efficient service. You can also use this number to locate any information about your project on the Department's website.

We will make every effort to ensure that the assessment of your proposed action is handled in a professional and helpful manner. A project manager for the next stage of the process has been appointed and will be happy to answer any questions you might have. You can contact Mr James Barker by telephone on 02 6274 1933 or by email at james.barker@environment.gov.au

Yours sincerely

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

A/g Director
Queensland Section
Environment Assessment Branch

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

From: s. 22(1)(a)(ii)
Sent: Tuesday, 2 February 2010 11:36
To: Barker, James
Cc: s. 22(1)(a)(ii)
Subject: New referral allocated to your section in RAD - (EPBC 2010/5343) [SEC=UNCLASSIFIED]

Categories: UNCLASSIFIED

To James Barker, Director of Mining Section

We have received a referral from Arrow Energy to increase the production capacity of the Surat Basin operations through the initial development of gas fields and expansion of existing gas fields near Dalby, Queensland. The referral has been allocated to your section in RAD with the EPBC reference number 2010/5343. You can access the relevant electronic documents at T:\Branch Folders\EAB\Projects\2010\2010-5343 Arrow Energy, Dalby expansion project, QLD

If you believe this referral has been incorrectly allocated to your section you will need to contact us within 24 hours to arrange a re-allocation.

The statutory timeframe for a decision on this referral is currently 2 March 2010.

The interim hardcopy file has been forwarded to your section and a TRIM file has been ordered in your name. Once you receive the formal TRIM file could you please add the relevant documents to the TRIM file and return the empty yellow folder cover to BEP.

Please feel free to contact s. 22(1)(a)(ii) on s. 22(1)(a)(ii) if you have any queries about this process.

Thank you
BEP (Referrals - Business Entry Point)

An Australian Government Initiative business.gov.au ABN Lookup

Current details for 73 078 521 936

This extract is based on information supplied by businesses to the Registrar of the Australian Business Register. Neither the Registrar nor the Federal Government guarantee this information is accurate, up to date or complete. Consider verifying this information from other sources.

ABN: **73 078 521 936**

View ABN history

Last modified: **23 Jan 2009**

ABN status: **Active from 01 Nov 1999**

Entity name: **ARROW ENERGY LTD**

Entity type: Australian Public Company

GST status: **Effective from 01 Jul 2000**

Main business location

State: **QLD**

Postcode: **4000**

Trading name(s)

ARROW ENERGY NL
Coastal Joint Venture
Daandine Joint Venture
Kogan North Joint Venture
North Joint Venture
South Joint Venture

Other registrations

Deductible Gift Recipient: **Not entitled to receive tax deductible gifts**

ACN or ARBN: **078521936**

Search ASIC

Retrieved on: **02 Feb 2010** Last updated on: **02 Feb 2010**

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

28/1/10
Hard Copies in post, received 29/1
1/2 - discs no good
- asked for docs to be emailed.

From: s. 47F(1) @coffey.com]
Sent: Wednesday, 27 January 2010 17:26
To: s. 47F(1) EPBC Referrals
Cc: s. 47F(1)
Subject: Referrals under the EPBC Act - Arrow Energy Surat Gas Project and Dalby Expansion Project
Attachments: SuratGasProject_EPBC_Referral.pdf; SuratGasProject_EPBC_Referral.doc; DalbyExpansionProject_EPBC_Referral.doc; DalbyExpansionProject_EPBC_Referral.pdf

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

Please find attached two referrals under the EPBC Act on behalf of Arrow Energy for the **Surat Gas Project** and the **Dalby Expansion Project**. Both a .pdf and Microsoft word file (.doc) are attached as required under the EPBC Act referral guidelines. As the attachments and figures have large cumulative file sizes they have been posted on a CD, along with the hardcopy.

Arrow Energy are also reviewing the development potential of their tenements within the Bowen Basin gas fields. An additional referral for this project is likely to be submitted within the next few months. Arrow would like to brief DEWHA on the Surat Gas Project, Dalby Expansion Project and the Bowen Gas Project in person. This will clarify the purpose of each project and will allow DEWHA to ask questions. We will be in contact to discuss whether DEWHA would be interested and to arrange a suitable time.

If you have any questions regarding the referrals please contact either myself on the details below, or s. 47F(1) from Arrow Energy on s. 47F(1) or s. 47F(1)@arrowenergy.com.au.

Regards

s. 47F(1)

Senior Consultant
Coffey Environments
Level 21, 12 Creek Street Brisbane QLD 4000 Australia
T (s. 47F(1) 5 F s. 47F(1) M s. 47F(1)
coffey.com

50 YEARS
AN EXTRAORDINARY JOURNEY

coffey natural systems
SPECIALISTS IN PEOPLE AND PLACE

s. 47F(1)
Senior Consultant
s. 47F(1) r@coffey.com
s. 47F(1)

Coffey Natural Systems
Level 21, Comalco Place, 12 Creek Street
Brisbane Queensland 4000 Australia
T (+61) (7) 3002 0415 F (+61) (7) 3002 0444 www.coffey.com

DALBY EXPANSION PROJECT
EPBC ACT REFERRAL

Arrow Energy

January 2010

coffey natural systems
SPECIALISTS IN PEOPLE AND PLACE

Coffey Natural Systems Pty Ltd ABN 61 005 041 878
Level 21, 12 Creek Street Brisbane QLD 4000 Australia
T (+61) (7) 3002 0400 F (+61) (7) 3002 0444
coffey.com

Project director	s. 47F(1)		
Project manager	s. 47F(1)		
Version:	**Details:**	**Approved:**	**Date:**
7040_v1	Final for exhibition	s. 47F(1)	14 January 2010

Australian Government

Department of the Environment, Water, Heritage and the Arts

Referral of proposed action

What is a referral?

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) provides for the protection of the environment, especially matters of national environmental significance (NES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the matters of NES without approval from the Australian Government Environment Minister or the Minister's delegate. (Further references to 'the Minister' in this form include references to the Minister's delegate.) To obtain approval from the Environment Minister, a proposed action should be referred. The purpose of a referral is to obtain a decision on whether your proposed action will need formal assessment and approval under the EPBC Act.

Your referral will be the principal basis for the Minister's decision as to whether approval is necessary and, if so, the type of assessment that will be undertaken. These decisions are made within 20 business days, provided that sufficient information is provided in the referral.

Who can make a referral?

Referrals may be made by or on behalf of a person proposing to take an action, the Commonwealth or a Commonwealth agency, a state or territory government, or agency, provided that the relevant government or agency has administrative responsibilities relating to the action.

When do I need to make a referral?

A referral must be made for actions that are likely to have a significant impact on the following matters protected by Part 3 of the EPBC Act:

- World Heritage properties (sections 12 and 15A)
- National Heritage places (sections 15B and 15C)
- Wetlands of international importance (sections 16 and 17B)
- Listed threatened species and communities (sections 18 and 18A)
- Listed migratory species (sections 20 and 20A)
- Protection of the environment from nuclear actions (sections 21 and 22A)
- Commonwealth marine environment (sections 23 and 24A)
- The environment, if the action involves Commonwealth land (sections 26 and 27A), including:
    - actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land);
    - actions taken on Commonwealth land that may have a significant impact on the environment generally;
- The environment, if the action is taken by the Commonwealth (section 28)
- Commonwealth Heritage places outside the Australian jurisdiction (sections 27B and 27C)

You may still make a referral if you believe your action is not going to have a significant impact, or if you are unsure. This will provide a greater level of certainty that Commonwealth assessment requirements have been met.

To help you decide whether or not your proposed action requires approval (and therefore, if you should make a referral), the following guidance is available from the Department's web site:

- the Policy Statement titled Significant Impact Guidelines 1.1 – Matters of National Environmental Significance. Additional sectoral guidelines are also available.
- the Policy Statement titled Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies.
- the interactive map tool (enter a location to obtain a report on what matters of NES may occur in that location).

Can I refer part of a larger action?

In certain circumstances, the Minister may not accept a referral for an action that is a component of a larger action and may request the person proposing to take the action to refer the larger action for consideration under the EPBC Act (Section 74A, EPBC Act). If you wish to make a referral for a staged or component referral, read 'Fact Sheet 6 Staged Developments/Split Referrals' and contact the Referral Business Entry Point (1800 803 772).

Do I need a permit?

Some activities may also require a permit under other sections of the EPBC Act. Information is available on the Department's web site.

What information do I need to provide?

Completing all parts of this form will ensure that you submit the required information and will also assist the Department to process your referral efficiently.

You can complete your referral by entering your information into this Word file.

Instructions

Instructions are provided in green text throughout the form.

Attachments/supporting information

The referral form should contain sufficient information to provide an adequate basis for a decision on the likely impacts of the proposed action. You should also provide supporting documentation, such as environmental reports or surveys, as attachments.

Coloured maps, figures or photographs to help explain the project and its location should also be submitted with your referral. Aerial photographs, in particular, can provide a useful perspective and context. Figures should be good quality as they may be scanned and viewed electronically as black and white documents. Maps should be of a scale that clearly shows the location of the proposed action and any environmental aspects of interest.

Please ensure any attachments are below two megabytes (2mb) as they will be published on the Department's website for public comment. To minimise file size, enclose maps and figures as separate files if necessary. If unsure, contact the Referral Business Entry Point for advice. Attachments larger than two megabytes (2mb) may delay processing of your referral.

Note: the Minister may decide not to publish information that the Minister is satisfied is commercial-in-confidence.

How do I submit a referral?

Referrals may be submitted by mail, fax or email.

Mail to:

Referral Business Entry Point
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

- If submitting via mail, electronic copies of documentation (on CD/DVD or by email) are appreciated.

Fax to: 02 6274 1789

- Faxed documents must be of sufficiently clear quality to be scanned into electronic format.
- Address the fax to the mailing address, and clearly mark it as a 'Referral under the EPBC Act'.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

Email to: epbc.referrals@environment.gov.au

- Clearly mark the email as a 'Referral under the EPBC Act'.
- Attach the referral as a Microsoft Word file and, if possible, a PDF file.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

What happens next?

Following receipt of a valid referral (containing all required information) you will be advised of the next steps in the process, and the referral and attachments will be published on the Department's web site for public comment.

The Department will write to you within 20 business days to advise you of the outcome of your referral and whether or not formal assessment and approval under the EPBC Act is required. There are a number of possible decisions regarding your referral:

The proposed action is NOT LIKELY to have a significant impact and does NOT NEED approval

No further consideration is required under the environmental assessment provisions of the EPBC Act and the action can proceed (subject to any other Commonwealth, state or local government requirements).

The proposed action is NOT LIKELY to have a significant impact IF undertaken in a particular manner

The particular manner in which you must carry out the action will be identified as part of the final decision. You must report your compliance with the particular manner to the Department.

The proposed action is LIKELY to have a significant impact and does NEED approval

If the action is likely to have a significant impact a decision will be made that it is a *controlled action*. The particular matters upon which the action may have a significant impact (such as World Heritage values or threatened species) are known as the *controlling provisions*.

The controlled action is subject to a public assessment process before a final decision can be made about whether to approve it. The assessment approach will usually be decided at the same time as the controlled action decision. (Further information about the levels of assessment and basis for deciding the approach are available on the Department's web site.)

The proposed action would have UNACCEPTABLE impacts and CANNOT proceed

The Minister may decide, on the basis of the information in the referral, that a referred action would have clearly unacceptable impacts on a protected matter and cannot proceed.

Compliance audits

If a decision is made to approve a project, the Department may audit it at any time to ensure that it is completed in accordance with the approval decision or the information provided in the referral. If the project changes, such that the likelihood of significant impacts could vary, you should write to the Department to advise of the changes.

For more information

- call the Department of the Environment, Water, Heritage and the Arts Community Information Unit on 1800 803 772 or
- visit the web site www.environment.gov.au/epbc

All the information you need to make a referral, including documents referenced in this form, can be accessed from the above web site.

Referral of proposed action

Project title: Dalby Expansion Project

1 Summary of proposed action

NOTE: You must also attach a map/plan(s) showing the location and approximate boundaries of the area in which the project is to occur. Maps in A4 size are preferred. You must also attach a map(s)/plan(s) showing the location and boundaries of the project area in respect to any features identified in 3.1 & 3.2, as well as the extent of any freehold, leasehold or other tenure identified in 3.3(j).

1.1 **Short description**

Use 2 or 3 sentences to uniquely identify the proposed action and its location.

Arrow Energy (Arrow) proposes to increase the production capacity of its Surat Basin operations through the Dalby Expansion Project. The project will involve an expansion of existing gas field operations within the Tipton West, Daandine, Stratheden and Kogan North, and through the initial development of Plainview, Long Swamp and Meenawarra gas fields. The gas fields are located 20 to 40 km south and west of Dalby, in Queensland's Surat Basin.

The Dalby Expansion Project will involve the development of up to 300 new production wells, two integrated production facilities including gas compression, water treatment, power generation and high pressure gas pipelines that will connect the facilities to existing and proposed sales gas delivery infrastructure. Activities are scheduled to occur between 2010 and 2012.

Gas produced from the nominated fields will maintain supply under existing domestic gas sales agreements and confirm a viable gas supply to proposed export LNG projects.

1.2 **Latitude and longitude**

Latitude and longitude details are used to accurately map the boundary of the proposed action. If these coordinates are inaccurate or insufficient it may delay the processing of your referral.

location point	Latitude			Longitude		
	degrees	minutes	seconds	degrees	minutes	seconds
5	26	52	54.34	150	50	3.92
6	26	52	54.34	150	51	3.92
7	26	53	54.34	150	51	3.92
8	26	53	54.34	150	53	3.92
9	26	54	54.35	150	53	3.92
10	26	54	54.35	150	54	3.92
11	26	57	54.35	150	54	3.92
12	26	57	54.35	150	56	3.92
13	26	58	54.34	150	56	3.92
14	26	58	54.34	150	57	3.92
15	27	4	54.35	150	57	3.91
16	27	4	54.32	151	6	3.86
17	27	5	54.32	151	6	3.86
18	27	5	54.32	151	7	3.86
19	27	6	54.32	151	7	3.86
20	27	6	54.32	151	8	3.86
21	27	7	54.32	151	8	3.86
22	27	7	54.32	151	9	3.86
23	27	8	54.32	151	9	3.86
24	27	8	54.32	151	10	3.86
25	27	9	52.72	151	10	3.86
26	27	9	58.35	151	10	3.9
27	27	9	54.34	151	10	3.9
28	27	9	54.34	151	12	3.9
29	27	10	54.34	151	12	3.9
30	27	10	54.34	151	15	3.9
31	27	9	54.34	151	15	3.9
32	27	9	54.34	151	17	3.9
33	27	10	54.34	151	17	3.9
34	27	10	54.34	151	18	3.9
35	27	12	54.34	151	18	3.9
36	27	12	54.34	151	14	3.9
37	27	13	54.34	151	14	3.9
38	27	13	54.34	151	15	3.9
39	27	14	54.34	151	15	3.9
40	27	14	54.34	151	16	3.9
41	27	15	54.34	151	16	3.9
42	27	15	54.34	151	17	3.9
43	27	16	54.34	151	17	3.9
44	27	16	54.34	151	18	3.91
45	27	18	54.34	151	18	3.91
46	27	18	54.34	151	19	3.91
47	27	19	54.34	151	19	3.91
48	27	19	54.34	151	15	3.91
49	27	34	54.27	151	15	3.65
50	27	34	54.28	151	5	3.66
51	27	14	54.34	151	5	3.87
52	27	14	54.34	151	0	3.9
53	27	9	54.35	151	0	3.9
54	27	9	54.34	150	58	3.9
55	27	8	54.34	150	58	3.9
56	27	8	54.34	150	56	3.9
57	27	7	54.34	150	56	3.9
58	27	7	54.34	150	55	3.9
59	27	4	54.35	150	55	3.91
60	27	4	54.35	150	50	3.91

The Interactive Mapping Tool may provide assistance in determining the coordinates for your project area.

If area less than 5 hectares, provide the location as a single pair of latitude and longitude references. If area greater than 5 hectares, provide bounding location points.

If the proposed action is linear (eg. a road or pipeline), provide coordinates for each turning point.

Do not use AMG coordinates.

1.3 **Locality**

Provide a brief physical description of the project location (eg. proximity to major towns, or for off-shore projects, shortest distance to mainland).

The proposed action is located approximately 20 to 40 km west of Dalby, and 200 km west of Brisbane, Queensland. The site is within the Eastern Darling Downs Province of the Brigalow Belt South Bioregion. The following figures display the region and the existing and proposed development:

- Figure 1 shows the location of the Dalby Expansion Project.
- Figure 2 shows the current field development.
- Figure 3 shows the proposed additional field development.

1.4 **Size of the development footprint or work area (hectares)**

Field Development

Production wells

The approximate area required for development of production wells is initially 60 m by 70 m for each new site. Following drilling and well establishment activities, each well site is rehabilitated leaving a production area of approximately 10 m by 10 m for well operation. Wherever possible, wells will be typically set out in a grid spacing of between 700 m and 1,200 m.

There are six key development areas, each are proposed to contain approximately 50 wells. Therefore, for the 50 proposed wells in each well area the initial area of disturbance will be approximately 0.21 sq km. As there will be six well areas, this will be an approximate area of disturbance for all new well development of 1.26 sq km. Please note, as the individual well area is reduced to 10 m by 10 m when the well is completed the total area will also be reduced to 0.03 sq km.

Gathering pipelines and access tracks

A right of way of up to 30 m (typically 18 to 24 m) width is required to install the gas and water gathering pipelines. Permanent access tracks, approximately 3 m wide, are maintained to each well site and will be typically located adjacent to the gas and water gathering lines. Existing tracks will be used where possible. The balance of the construction right of way is rehabilitated.

Integrated Production Facilities (IPF) Development

The approximate area required for each new integrated production facility is 750 m by 350 m. This area will incorporate the central gas processing, power generation and water treatment facilities. In addition, a further approximate 100 ha is required for dams to store associated water including feed water, treated water, oily water and brine concentrate.

High Pressure Gas Pipelines

A high pressure gas pipeline, approximately 5 km long, is required to connect the new IPFs to existing sales gas delivery infrastructure. The right of way required to construct this pipeline will be approximately 30 m wide.

A similar width construction right of way is required to construct the proposed 50-km-long high pressure in-field gas pipeline that will connect the proposed Theten and Duntroon IPFs to the existing Braemar II pipeline and the proposed Surat to Gladstone Pipeline.

1.5 **Street address of the site**

Arrow's Dalby site office address is:

Arrow Energy Ltd
37 Bennie Street
Dalby Qld 4405

1.6 **Lot description**

Describe the lot numbers and title description, if known.

Due to the nature of the project and the large area covered by petroleum leases or applications for leases, numerous lots will be affected by the development. A list of affected lots can be provided on request.

1.7 **Local Government Area and Council contact (if known)**
If the project is subject to local government planning approval, provide the name of the relevant council contact officer.

The proposed Dalby Expansion Project area is located within the Western Downs Regional Council in the northwest and Toowoomba Regional Council to the southeast.

1.8 **Timeframe**
Specify the timeframe in which the action will be taken including the estimated start date of construction/operation.

Field development and associated infrastructure for the expansion is anticipated to commence in early 2010. Production wells are likely to be drilled at the rate of 10 to 15 wells per month. Each integrated production facility is expected to take 12 to 18 months to construct. The proposed facilities are expected to be constructed concurrently, with commissioning of the facilities likely in late 2011 / early 2012. Construction timeframes and commissioning dates are subject to obtaining the necessary State and Commonwealth Government approvals.

The anticipated production life for the gas wells is in excess of 20 years.

1.9	**Alternatives** Does the proposed action include alternative timeframes, locations or activities?	X	No
			Yes, you must also complete section 2.2
1.10	**State assessment** Is the action subject to a state or territory environmental impact assessment?		No
		X	Yes, you must also complete Section 2.4
1.11	**Component of larger action** Is the proposed action a component of a larger action?	X	No
			Yes, you must also complete Section 2.6
1.12	**Related actions/proposals** Is the proposed action related to other actions or proposals in the region (if known)?		No
		X	Yes, provide details: The Dalby Expansion Project satisfies Arrow's need to meet its contractual obligations under current domestic gas supply agreements, as well as proving that a viable gas supply exists for proposed export LNG developments at and adjacent to Gladstone. Gas produced from the nominated facilities will be initially used to supply residential, commercial and industrial customers and in power generation for sale of electricity to the National Electricity Market. Supply over domestic market requirements will later be directed to proposed LNG developments if they achieve the necessary environmental approvals and financial commitments. The Surat Gas Project, for which a separate referral has been prepared and will be lodged concurrently with this referral, will facilitate further development of Arrow's Surat Basin coal seam gas reserves to meet the demand expected from proposed export LNG developments. The Surat Gas Project encompasses some 8,000 km^2 of the Surat Basin, with the project area extending from Wandoan in the north to Goondiwindi in the south, in an arc through Dalby. The Surat Gas Project area encompasses the Dalby Expansion Project area as shown in Figure 4. That project (the Surat Gas Project) will assess the environmental, social and economic impacts associated with development of infrastructure and facilities not described in this referral. A voluntary Environmental Impact

			Statement under the *Environment Protection Act 1994* (Qld) is being prepared by Arrow for the Surat Gas Project. The Dalby Expansion Project, a continuation of existing operations, will be assessed under the *Environment Protection Act 1994* (Qld), as a Level 1 petroleum activity not requiring an EIS. Related projects that facilitate delivery of coal seam gas to proposed export LNG developments and the developments themselves are: Surat to Gladstone Pipeline – this proposed high pressure gas pipeline will transport gas from near Kogan North in the Surat Basin to Gladstone on the Queensland coast. To be constructed and operated by Surat Gladstone Pipeline Pty Ltd, it will supply proposed LNG developments adjacent to Gladstone. An EIS under the Environment Protection Act has been prepared for the proposed pipeline. An EPBC Act referral (2009/5029) has been submitted for the project which was declared a controlled action on 15 October 2009. Assessment on preliminary information was nominated as the appropriate level of assessment for potential significant impacts on listed threatened species and communities (Sections 18 and 18A). Gladstone LNG Project – LNG Ltd proposes the development of an initial 1.5 Mtpa LNG plant on Fisherman's Landing north of Gladstone. The proposed plant is expected to take feed gas supply from the proposed Surat to Gladstone Pipeline. An EIS under the Environment Protection Act has been prepared for the proposed facility. The proposed action was referred (2008/3954) and it was determined that is was not a controlled action on 1 February 2008. Shell Australia LNG Project – Shell CSG (Australia) Pty Ltd (Shell) proposes the development of an up to 16 Mtpa LNG facility on Curtis Island off Gladstone, Queensland. The proposed plant is expected to take feed gas supply from the proposed Surat to Gladstone Pipeline. Shell is preparing an EIS under the *State Development and Public Works Organisation Act 1970* (Qld) for the project. Two EPBC Act referrals have been lodged for this project, one for the proposed feed gas pipeline, a short section of pipeline from near the Gladstone City Gate to the LNG plant (2009/5008) and a second for the LNG facility including plant and marine loading facility (2009/5007). The proposed development has been declared a controlled action and the Queensland EIS process accredited as the appropriate level of assessment.
1.13	**Australian Government funding** Has the person proposing to take the action received any Australian Government grant funding to undertake this project?	X	No
			Yes, provide details:

2 Detailed description of proposed action

NOTE: It is important that the description is complete and includes all components and activities associated with the action. If certain related components are not intended to be included within the scope of the referral, this should be clearly explained in section 2.6.

2.1 Description of proposed action

This should be a detailed description outlining all activities and aspects of the proposed action and should reference figures and/or attachments, as appropriate.

Arrow proposes to expand its operations within existing and new petroleum tenements in the Surat Basin in South East Queensland. Figure 2 shows the current field development, as Petroleum Leases (PLs) and Petroleum Lease Applications (PL(A)s) within the project area. The activities are summarised in Table 1 and are provided in more detail below. Figure 3 shows the location of proposed new field development, compression and water treatment facilities and power generation infrastructure.

Gas from the Dalby Expansion Project will be used to maintain supply under existing domestic gas sales agreements, and to confirm a viable gas supply for identified liquefied natural gas (LNG) opportunities that may commence production from 2012.

Table 1 Expansion activities

Field Development	
Production wells and associated infrastructure	300 production wells and associated well infrastructure including gas and water gathering lines, communications cables and access tracks.
Integrated Production Facilities Development	
Gas processing facilities	Two new electric motor driven integrated production facilities (IPFs) with a maximum daily output of 85 TJ/d each. These include: • New facility at Theten (PL 230). • New facility at Duntroon (PL 198) which is adjacent to the existing Tipton West facility. A facility at Lynwood North is also proposed as a back-up option to the proposed Duntroon facility which remains subject to the outcome of land access negotiations and other clearances.
Water treatment facilities and disposal	• Potentially expanding water treatment facilities at Tipton West (PL 198). This is within the scope of the current Environment Authority and assessment is being undertaken by the Queensland Department of Environment and Resource Management. • A new reverse osmosis water treatment (ROWT) facility at Theten and Duntroon (or Lynwood North), and associated feed water dams, brine concentrate holding dams and treated water dams.
Power supply or generation	New power generation and distribution infrastructure to facilitate power distribution to IPFs, water treatment facilities and production wells located at Theten, and Duntroon (or Lynwood North).
Pipeline connections	• An approximate 5-km-long high pressure gas pipeline from new IPFs to existing sales gas delivery infrastructure. • A proposed 50-km-long high pressure in-field gas pipeline that will connect the proposed Theten, Duntroon IPFs and Lynwood North (if required) to the proposed Surat to Gladstone Pipeline.

Note: All field development and integrated production facilities development are being assessed through the Queensland Department of Environment and Resource Management.

FIELD DEVELOPMENT

Production wells and associated infrastructure

Arrow proposes to establish 300 production wells, as a continuation of its current activities. Where possible, the wells will be typically set out in a grid with a spacing of between 700 m and 1,200 m. The proposed development areas are shown on Figure 3.

To ensure safe operation of the drilling rig and associated equipment, the well drilling sites normally involve an area of approximately 60 m by 70 m. This is sufficiently large enough for a truck mounted drilling rig, with space around the rig for work related access and materials handling. Prior to drilling a well, a temporary site is prepared. Preparation generally involves:

- Vegetation clearance or trimming.
- Levelling of a drill pad if necessary.
- Excavation and construction of temporary pits to hold drilling fluids and water produced during drilling.
- Excavation of a pit for a ground flare.

Once wells are installed, the well site footprint is reduced to approximately 10 m by 10 m. The site is fenced to enclose the wellhead and other infrastructure (wellhead gas/water separator, control valve, monitoring, metering and communications equipment). The fenced well sites prevent stock and public access to the wellhead. The larger drilling site footprint is then rehabilitated to a land use consistent with surrounding area, or to a standard agreed with the landholder. Farming and grazing activities can continue as normal around established well sites.

If the land use is native vegetation, then site rehabilitation will utilise suitable native tree and grass species (where possible the species will be specific to the original ecosystem). Natural re-seeding of native species is likely to occur if there has been stock piling of removed topsoil, which is reused in rehabilitation. Native vegetative waste will also be spread over disturbed areas to provide a natural source of seed and additional fauna refuge. Use of native grass (or native alternative) species from inland southern Queensland will be undertaken when rapid vegetative cover is required to prevent soil loss.

There will be low-pressure gathering lines to take gas from the wells to the IPFs for compression. Water gathering lines will also be required to transfer associated water from wells to water treatment facilities.

New water and gas gathering lines will be constructed of small diameter high-density polyethylene (HDPE) pipe. Gathering lines will be buried at a minimum depth of 750 mm. The location of gathering lines and utility trenches will be agreed with landholders to minimise disruption to agricultural activities and to minimise the potential for damage to the gathering lines from agricultural machinery. Locating infrastructure within or adjacent to existing farm tracks and cultivation lines is generally favourable. Table 2 outlines the proposed development and the number of wells proposed per petroleum lease.

Table 2 Proposed well development

Petroleum Lease	Number of Existing Production Wells	Number of New Production Wells	Total Number of Production Wells
PL 194	64	**35**	99
PL 198	140	**25**	165
PL 230	72	**40**	112
PL 252	0	**50**	50
PL 238	0	**50**	50
PL(A) 258	0	**50**	50
PL(A) 260	0	**50**	50
Total	**276**	**300**	**576**

INTEGRATED PRODUCTION FACILITIES

Central Gas Processing Facilities

Compression facilities receive gas from the gathering lines, and compress and dewater the gas, prior to directing it to sales gas pipelines. Arrow proposes to construct two new electric motor driven IPFs on PL 230 and PL 198. These facilities are called the Theten IPF and the Duntroon IPF (the latter being a new facility located adjacent to the existing facility). The facilities will each have a maximum daily output of approximately 85 TJ/d.

The Lynwood North facility is proposed as a back-up option to the proposed Duntroon facility which remains subject to the outcome of land access negotiations.

Each facility will include a control room to monitor field development. There will also be service buildings, offices and a flare system. Communication between facilities will be via fibre optic link.

Arrow proposes to co-locate central gas processing, water treatment and power generation facilities.

The proposed IPF sites have been selected on the grounds of environmental sensitivity and ease of construction and operation. Flora and fauna constraints mapping has been undertaken to ensure that facility sites have minimal impact on sensitive ecological values.

Water Treatment Facilities and Disposal

Expansion of Existing Facilities

A reverse osmosis water treatment plant is currently being commissioned at Daandine with a new purpose built fully lined feed water dam, clay lined treated water dam, and a lined waste water dam. Brine concentrate is discharged into an existing dam recently recertified for this purpose.

On current forecasts, Tipton West (adjacent to the Duntroon site) may require expansion of its capabilities by mid 2010, depending on the production forecasts and timing of construction of the Duntroon facility. The expansion would comprise a reverse osmosis water treatment plant, new feed and treated water dams, with brine handling managed in existing dams, which will be certified as fit for purpose. The expansion of the facilities will be assessed by the Queensland Department of Environment and Resource Management.

New Facilities

Two new reverse osmosis water treatment facilities will be constructed. These will be co-located with the new central gas processing facilities at Theten and Duntroon as shown in Figure 3. The water treatment facilities will also be proposed at the Lynwood North site, if the Duntroon site provides to be unviable.

The new water treatment facilities are each proposed to include a fully lined feedwater dam, unlined treated water dam, nominally two lined concentrated brine dams, and a lined wastewater dam.

Potential beneficial uses for treated water are being investigated by Arrow. The current base-case water management strategy is to use the treated water for irrigation within the vicinity of proposed operations. Delivery points target existing irrigation infrastructure, however it is possible that additional infrastructure will be constructed to manage the increased supply of water for irrigation. Once the beneficial reuse planning is finalised, any new infrastructure required will be assessed by the Queensland Department of Environment and Resource Management and will be referred to DEWHA under the EPBC Act if required.

Arrow, in conjunction with other Surat Basin coal seam gas producers, is also considering a long-term aggregated solution for water treatment, treated water distribution and brine disposal.

Power Supply or Generation

Arrow proposes to construct gas-engine driven power stations at each integrated facility site. The approximate output of each power station would be 30 to 40 MW. Power station sizing has been determined by overall power requirements for gas compression, water treatment and wells associated with the facility. The latter

would only be electric powered where practicable. In all other instances they would be powered by gas driven generators at the production well site.

Initial wells will be powered using gas driven generation sets located at the well site.

Gas from the field gathering system will be fed directly to the power station gas-engine generators. Facilities will be put in place at the inlet of the power station to control any free water and / or particulates which may be present in the gathering piping.

Power from the stations will be used within the facility footprint area to meet the power requirements for gas compression and water treatment. Power will also be distributed to the adjacent gas field via a combination of overhead and underground cabling located within service corridors.

High Pressure Gas Pipelines

A proposed 50-km-long high pressure in-field gas pipeline will connect the proposed Theten and Duntroon IPFs to the existing Braemar II pipeline and the proposed Surat to Gladstone Pipeline near Kogan North. In the event that the Lynwood North facility is progressed in favour of the Duntroon facility, the proposed high pressure pipeline would be extended south to Lynwood North.

The high pressure gas pipeline route has been selected (as for all infrastructure in the Dalby Expansion Project) to avoid areas of moderate or high environmental sensitivity / constraints and activity based environmental management processes and controls will apply (as for gathering lines). The proposed pipeline route is shown on Figure 5. The detailed route of the pipeline within this general alignment will be dependent on land access negotiations and the application of the Arrow's Environmental Management Standard Operating Procedure for Site Selection, including reference to environmental constraints maps.

The pipeline will be designed, constructed and decommissioned in accordance with Australian Standard 2885 and any additional requirements adopted for the Surat to Gladstone Pipeline.

Final Decommissioning and Rehabilitation

Wells will be decommissioned when they reach the end of their useful life. All surface equipment will be removed, the well casing will be cut off (approximately 1.5 m) below the ground surface and the well hole plugged with concrete. The well site fence will be removed and the site rehabilitated to a land use consistent with the local area, or as agreed with the landholder. Rehabilitation may involve reinstatement of original contours, regrading surface topsoils, ensuring erosion controls are in place, and re-establishing drainage lines and pasture species (or alternative arrangements agreed with the landholder).

All other infrastructure will be removed from the site (IPF, water treatment facilities, power supply) and the land rehabilitated to its former land use (where possible). Water dams and access tracks may be useful for landholder. An agreement will be in place if infrastructure is to remain for landholder purposes.

2.2 Alternative locations, time frames or activities that form part of the referred action

If you have identified that the proposed action includes alternative timeframes, locations or activities (in section 1.9) you must complete this section. Describe any alternatives related to the physical location of the action, time-frames within which the action is to be taken and alternative methods or activities for undertaking the action. Please note, if the action that you propose to take is determined to be a controlled action, any alternative locations, timeframes or activities that are identified here may be subject to environmental assessment and a decision on whether to approve the alternative.

Facility sites have been selected with consideration environmental conditions and ease of construction and operation. Well sites locations will also be selected using analysis of environmental conditions to ensure minimal impact on the environment.

Environmental constraints mapping has been conducted to ensure that the environmental values are clearly identified and known within the project area. A series of fieldwork investigations have also been undertaken to validate desktop selection.

2.3 Context, planning framework and state/local government requirements

Explain the context in which the action is proposed, including any relevant planning framework at the state and/or local government level (eg. within scope of a management plan, planning initiative or policy framework). Describe any Commonwealth or state legislation or policies under which approvals are required or will be considered against.

Arrow currently holds five Environmental Authorities (EAs) for the petroleum tenements associated with the Dalby Expansion Project (PLs 194, 198, 230, 238 and 252). In addition, Arrow has applied for environmental authorities for PL(A)s 258 and 260.

2.4 Environmental impact assessments under Commonwealth, state or territory legislation

If you have identified that the proposed action will be or has been subject to a state or territory environmental impact statement (in section 1.10) you must complete this section. Describe any environmental assessment of the relevant impacts of the project that has been, is being, or will be carried out under state or territory legislation. Specify the type and nature of the assessment, the relevant legislation and the current status of any assessments or approvals. Where possible, provide contact details for the state/territory assessment contact officer.

Describe or summarise any public consultation undertaken, or to be undertaken, during the assessment. Attach copies of relevant assessment documentation and outcomes of public consultations (if available).

An environmental authority is required for development of petroleum tenements granted and regulated under the *Petroleum and Gas (Production and Safety) Act 2004* (Qld). Exploration activities are currently being undertaken within the project development area under existing approvals. The exploration activities have already been approved and are not included in this referral. Dalby Expansion Project activities are level 1 petroleum activities for which an environmental authority under the *Environment Protection Act 1994* (Qld) is required. Environmental authorities are granted by the Queensland Department of Environment and Resources Management (DERM) and are the primary statutory documents used by DERM in its regulatory role to ensure environmental compliance of the project.

Dalby Expansion Project activities will be assessed and approved by amendment (and consolidation) of existing environmental authorities held by Arrow for the nominated petroleum tenements. An Environmental Management Plan (EM Plan) prepared by Arrow provides the information required by DERM to assess the application to amend (and consolidate) the environmental authorities into a project environmental authority.

2.5 Consultation with Indigenous stakeholders

Where Indigenous stakeholders are likely to be affected by your proposed action, your referral should describe any consultations undertaken with Indigenous stakeholders. Identify the relevant stakeholders and the status of consultations at the time of the referral.

Cultural Heritage

Arrow is currently finalising a review of its records to better understand the nature and scope of cultural heritage surveys that have occurred to date over its existing tenements. This work should be completed in the near future.

Arrow anticipates commencing the process for development of a Cultural Heritage Management Plan (CHMP) as required to comply with the *Aboriginal Cultural Heritage Act 2003* (Qld) in the first quarter of 2010. The CHMP will involve extensive consultation with Aboriginal parties and contain management and mitigation measures for Aboriginal cultural heritage during exploration, construction and operation phases of the project.

Native Title

Arrow has completed a review of its tenements to identify an order of priority for its operations. It is intended that Future Act processes as outlined in the *Native Title Act 1993* (Cwlth) will be followed to obtain the necessary approvals for Future Acts that may have an impact on native title rights and interests.

Arrow will seek to utilise both the voluntary and statutory processes outlined in the legislation and intends to commence the process in the first quarter of 2010, which will involve extensive consultation with Native Title parties.

2.6 A staged development or component of a larger project

If you have identified that the proposed action is a component of a larger action (in section 1.11) you must complete this section. Provide information about the larger action and details of any interdependency between the stages/components and the larger action. You may also provide justification as to why you believe it is reasonable for the referred action to be

considered separately from the larger proposal (eg. the referred action is 'stand-alone' and viable in its own right, there are separate responsibilities for component actions or approvals have been split in a similar way at the state or local government levels).

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest.

Your assessment of likely impacts should refer to the following resources (available from the Department's web site):

- specific values of individual World Heritage properties and National Heritage places and the ecological character of Ramsar wetlands;
- profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;
- *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*; and
- associated sectoral and species policy statements available on the web site, as relevant.

Note that even if your proposal will not be taken in a World Heritage area, Ramsar wetland, Commonwealth marine area, or on Commonwealth land, it could still impact upon these areas (for example, through downstream impacts). Consideration of likely impacts should include both direct and indirect impacts.

The approach to field development will follow environmental procedures developed to minimise impacts on significant environmental values (both State and Commonwealth). As there are existing operations within the project area, the procedures currently used will be implemented for siting new infrastructure . EPBC Act matters of national environmental significance have high environmental value and therefore stringent criteria for field development will be in place to avoid or minimise impacts on these values.

3.1 (a) World Heritage Properties

Description

None present.

Nature and extent of likely impact

Address any impacts on the World Heritage values of any World Heritage property.

3.1 (b) National Heritage Places

Description

None present.

Nature and extent of likely impact

Address any impacts on the National Heritage values of any National Heritage place.

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

The Dalby Expansion Project will be undertaken within the same catchment as the Narran Lake Nature Reserve, RAMSAR site. This site is located in the north west of NSW and is a significant site for water bird breeding (DEWHA 1999).

Nature and extent of likely impact

Address any impacts on the ecological character of any Ramsar wetlands.

The reserve covers part of a large terminal wetland of the Narran River at the end of the Condamine River (which flows from Queensland). The site is downstream of the project area and over 600 km to the southwest. There is a low likelihood of significant impacts on the nature reserve.

3.1 (d) Listed threatened species and ecological communities

Description

The EPBC Protected Matters search undertaken on 29 October 2009 identified 24 threatened species and 4 ecological communities as being potentially present within 5 km of the project area (Appendix 1). Threatened species included 6 birds, 3 mammals, 1 fish, 3 reptiles and 11 plants.

This list is based on the likelihood of occurrence according to distribution of species and their habitats from various government databases. To further assess if any additional EPBC Act listed species could potentially be present within the project area, both flora and fauna database searches were also undertaken.

For flora, the databases included DERM's Regional Ecosystem digital data, the Queensland Herbarium's HerbRecs database (extract August, 2009), DERM's WildNet database (which incorporates HerbRecs specimen data, CORVEG site data and may also include information from research and monitoring programs, inventory programs including extension activities, literature records, wildlife permit returns and community programs). An analysis of aerial photography of the area was also undertaken to assist in vegetation mapping. One flora species, *Bothriochloa biloba* (lobed blue grass) was identified through the DERM WildNet database and the Queensland Herbarium database as being recorded in the surrounding area. The species did not register in the EPBC Protected Matters Search. This species has been included in the assessment (resulting in a total of 12 plants).

For fauna, the information sources included Birds Australia Atlas database, DERM's WildNet database and specimen records held by the Queensland museum. One fauna species, *Dasyurus maculates* (spotted-tailed quoll) was identified through the WildNet database as being recorded in the project area, which did not register in the EPBC Protected Matters Search. This species has been included in the assessment (resulting in a total of 4 mammals).

Field surveys of the project area were undertaken in October and November 2009. The surveys targeted locating significant species and species habitat. Surveys also aimed to verify database and DERM's Regional Ecosystem mapping. A total of 85 flora sites were surveyed within the project area. The details of the searches and surveys are summarised below and provided in full in Appendix 2.

Table 3 shows the details of the EPBC Protected Matters search. The likelihood of occurrence was assessed using information from literature reviews and searches of additional databases and also from the October and November 2009 field surveys. Field surveys identified the brigalow ecological community, but failed to locate any EPBC Act listed flora or fauna species (excluding migratory species which are outlined in Section 3.1 (e)).

Table 3 Listed threatened species and ecological communities from EPBC Protected Matters Search and the likelihood of occurrence.

	Species	Status	Type of presence	Likelihood of occurrence
Ecological communities	Brigalow (*Acacia harpophylla* dominant and codominant)	Endangered	Community known to occur within area	***Present:*** This community has been identified within in the project area. The community encompasses RE's 11.9.5, 11.4.3 and 11.3.1 as well as a number of advanced regrowth brigalow communities.
	Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	Critically Endangered	Community likely to occur within area	***Unlikely:*** This community is unlikely to be present in the area. Queensland Regional Ecosystem mapping does not identify it as being present. Field surveys failed to locate the

				community.
	Weeping myall woodlands	Endangered	Community likely to occur within area	***Unlikely:*** This community is restricted to small patches that occur within two Regional Ecosystems in Queensland. These are 11.3.2 and 11.3.28. Only 11.3.2 is present within the project area however this is unlikely to support the weeping myall woodlands. Field surveys failed to locate the community.
	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area	***Unlikely:*** This community is unlikely to be present in the area. Queensland Regional Ecosystem mapping does not identify it as being present. Field surveys failed to locate the community.
Birds	*Anthochaera phrygia* Regent honeyeater	Endangered	Species or species habitat may occur within area	***Unlikely:*** The habitat for this species consists of dry eucalypt woodland and open forest, woodland, rural and urban areas with mature eucalypts; favours box-ironbark associations. The Regional Ecosystem mapping and field surveys indicate that there is limited habitat in the project area. Transient individuals from the south near Warwick have been recorded previously near the project area, however these are not permanent populations.
	Erthrottriorchis radiatus Red goshawk	Vulnerable	Species or species habitat likely to occur within area	***Unlikely:*** There is a record of the species from Lake Broadwater, however this is expected to be of a transient individual, not permanent populations. The present habitat is unlikely to be occupied by the species.

	Geophaps scripta scripta Squatter pigeon (southern)	Vulnerable	Species or species habitat likely to occur within area	***Unlikely:*** There have been no previous database records within the project area. The species is predominantly found north of Millmerran.
	Lathamus discolor Swift parrot	Endangered	Species or species habitat may occur within area	***Unlikely:*** There have been no previous database records within the project area. The species is predominantly found south of Chinchilla.
	Neochmia ruficauda ruficauda Star finch (eastern), star finch (southern)	Endangered	Species or species habitat likely to occur within area	***Unlikely:*** There have been no previous database records within the project area. The species is predominantly found south of Chinchilla.
	Rostratula australis Australian painted snipe	Vulnerable	Species or species habitat may occur within area	***Possible***: The habitat within the project area that may support this species include waterbodies, particularly those with a mosaic of fringing vegetation and open mudflats. Suitable habitat is restricted to Lake Broadwater and the vicinity immediately north at Long Swamp. The Birds Australia and WildNet databases indicate that this species has been recorded in the vicinity of the project area.
Mammals	*Chalinolobus dwyeri* Large-eared pied bat, large pied bat	Vulnerable	Species or species habitat may occur within area	***Unlikely:*** This species is known to inhabit caves and overhangs and higher altitude moist tall open forest adjacent to rainforest. There is limited habitat in the project area.
	Dasyurus hallucatus Northern quoll	Endangered	Species or species habitat may occur within area	***Unlikely:*** The northern quoll lives in a range of open woodland and forests, with dens in rock crevices, tree holes or termite mounds. There is limited habitat in the project area.

	Nyctophilus timoriensis (South-eastern form) Greater long-eared bat	Vulnerable	Species or species habitat may occur within area	***Unlikely***: Preferred habitat includes dry open woodland (box and/or ironbark, savannah) and mallee; particularly riparian vegetation (*Eucalyptus camaldulensis, Allocasuarina luehmanni, A. cristata and Callitris*), also vine thickets. There is limited habitat in the project area. Not located during the recent field surveys and no confirmed recorded species within the project area.
	Dasyurus maculatus Spotted-tailed quoll	Vulnerable	Species or species habitat may occur within area	***Unlikely***: Preferred habitat includes dry open woodland (box and/or ironbark, savannah) and mallee; particularly riparian vegetation (*Eucalyptus camaldulensis, Allocasuarina luehmanni, A. cristata and Callitris*), also vine thickets. There is limited habitat in the project area. Not located during the recent field surveys.
Ray-finned fishes	*Maccullochella peelii peelii* Murray cod, cod, goodoo	Vulnerable	Species or species habitat may occur within area	***Likely:*** The watercourses within the Condamine River catchment could provide habitat for the species.

Reptiles	*Anomalopus mackayi* Five-clawed worm-skink, long-legged wormskink	Vulnerable	Species or species habitat may occur within area	***Possible***: The habitat within the project area may support this species. The species prefers low open grassland with scattered trees to open grassy dry Eucalyptus and Callitris forest/woodland. Regional Ecosystem 11.3.21 provides habitat for the species however this was not present within the project area. A draft recovery plan is being prepared for Brigalow Belt Reptiles which includes this species (WWF, 2008).
	Furina dunmalli Dunmall's snake	Vulnerable	Species or species habitat may occur within area	***Possible:*** The habitat within the project area may support this species. Historic records are known from Lake Broadwater. Most records occur in remnant vegetation including Brigalow, open woodland and even tall forests. They may occur in any woodland or forest vegetation types within the project area, but are probably absent from disturbed vegetation.
	Tympanocryptis pinguicolla Grassland earless dragon	Endangered	Species or species habitat may occur within area	***Possible:*** Regional Ecosystem 11.3.21 (this was not present within the project area) provides habitat for the species. It is predominantly found between Toowoomba and Cecil Plains, within grasslands, including those on roadside verges. No known records west of Wilkie Creek.
Plants	*Acacia chinchillensis* Chinchilla Wattle	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** Suitable habitat exists within the project area (within Regional Ecosystem 11.5.1). Potential habitat

				includes flat to gently undulating plains within *Eucalyptus crebra, Callitris glaucophylla, Allocasuarina luehmannii* woodland to open forest. Targeted searches in suitable habitat failed to locate this species during field assessments. Potential to occur is low but still possible.
	Bothriochloa biloba Lobed blue grass	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** Suitable habitat exists within the project area. Database records exist of the species within the project area (2 km south of the Condamine River and 10 km north of Cecil Plans on roadsides).
	Cadellia pentastylis Ooline	Vulnerable	Species or species habitat likely to occur within area	***Unlikely:*** No previous records in vicinity. Sub optimal habitat exists within the project area.
	Dichanthium queenslandicum King blue-grass	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** Suitable habitat exists within the project area. Preferred habitat includes remnant and non-remnant derived grasslands on alluvium, cracking clays, and basalt. No previous records within the project area.
	Digitaria porrecta Finger panic grass	Endangered	Species or species habitat likely to occur within area	***Possible:*** Suitable habitat exists within the project area. Preferred habitat includes non-remnant derived grasslands on alluvium and cracking clays, Brigalow/Belah, and Eucalypt woodlands on heavy alluvial soils. Targeted searches failed to locate this species during field assessments. There are existing HerbRecs records of the species within the project area.
	Diuris sheaffiana Tricolour diuris	Vulnerable	Species or species habitat may occur	***Unlikely:*** No records in the vicinity. Sub optimal habitat exists

			within area	optimal habitat exists within the Project Area. Preferred habitat includes grass eucalypt woodland and open forest including *Eucalyptus populnea, E. pilligaensis*, often with *Callitris* on sandy or lateritic and landforms.
	Homopholis belsonii	Vulnerable	Species or species habitat may occur within area	***Possible:*** Suitable habitat exists within the project area. There are existing HerbRecs records of the species 4km east of Dalby, in *Casuarina cristata* and *Acacia melvillei* vegetation on grey to black alluvial soils. Has potential to occur in *Acacia harpophylla* and/or *Casuarina cristata* shrubby open forests on Cainozoic clay plains and regrowth types and may be associated with road reserves.
	Philotheca sporadica	Vulnerable	Species or species habitat likely to occur within area	***Likely:*** Suitable habitat exists within the project area. Preferred habitat includes rocky lateritic and sandstone rises and low ridges in mixed *Eucalypt/Callitris* woodlands including *Eucalyptus fibrosa* subsp. *nubila*, *E. crebra*, *E. exserta*, *Allocasuarina luehmannii*, *Callitris glaucophylla*, and *Corymbia trachyphloia*. Targeted searches failed to locate the species. However it has previously been recorded in the project area.
	Picris evae Hawkweed	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** Suitable habitat exists within the project area. Preferred habitat includes eucalyptus open grassy woodland, *Dichanthium sericeum*

				grassland, and non-remnant roadsides, paddocks and cultivated areas. Targeted searches failed to locate the species. However it has previously records exist (30 km south east of the project area).
	Rhaponticum australe Austral cornflower, native thistle	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** No records in vicinity. Sub optimal habitat exists within the Project Area Preferred habitat includes eucalypt open forest with grassy understorey on roadsides and on road reserves, and *Eucalyptus tereticornis* and *Angophora floribunda* on black clay soil (BRI collection records, n.d.).
	Thesium australe Austral toadflax, toadflax	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** Suitable habitat exists within the project area. There are previous database records within the project area. Preferred habitat includes roadside remnant and non-remnant grasslands and *Eucalyptus populnea* grassy woodlands on heavy soil alluvium.
	Tylophora linearis	Endangered	Species or species habitat may occur within area	***Unlikely:*** A known record is located at Glenmorgan, to the far west of the project area. Not likely to occur.

Nature and extent of likely impact

Address any impacts on the members of any listened threatened species or any threatened ecological community, or their habitat.

Ecological communities

3D Environmental (2009) has undertaken field surveys to confirm if the identified threatened communities are present or likely to be present in the project area. Of the four communities, the only community likely to be within the project area is the brigalow (*Acacia harpophylla* dominant and codominant), which was identified within PL 198, PL 252 and PL 260. Figure 5 shows the distribution of the community within the project area.

The proposed location of the Theten IPF and Duntroon IPF is provided in Figure 6 and 7 with the mapped brigalow community. The Theten IPF site has a small non-remnant area on the eastern boundary and to the north on Theten Road. Duntroon IPF site does not have any remnants present. The Lynwood North option in Figure 8 shows there are two small fragments of the EPBC community present. All proposed development activities are located some distance from these sites.

As the extent of brigalow is highly fragmented, with small patches located within the area, the proposed options for infrastructure locations have been designed to avoid disturbance. Final site selection will be refined in consultation with a suitably qualified ecologist to ensure avoidance of all fragments.

Appendix 2 contains the 3D Environmental (2009) report which provides a detailed assessment of the likelihood of impacts from the project.

The proposed well areas and the pipeline connection to sales gas infrastructure and the EPBC communities are shown on Figure 9. The actual well site locations can be strategically placed around sensitive environmental areas and the pipeline right of way can also be reduced or shifted to avoid impacts. Due to the fragmented nature of the brigalow within the project area, it will be feasible to avoid these locations. Details of measures to avoid impacts are provided in Section 4.

Arrow intends to avoid clearing of EPBC Act listed vegetation, wherever possible, and minimise clearance wherever unavoidable. Therefore, direct impacts to the community are considered to be minimal. There is potential for indirect impacts such as an increase in weeds. However, proposed measures to avoid or reduce impacts (see Section 4) minimise the potential for significant impacts.

Birds

The only EPBC Act bird species likely to be present within the project area is the *Rostratula australis* (Australian painted snipe). This species prefers habitat within waterbodies and open mudflats. Suitable habitat is uncommon in the project area, and restricted to Lake Broadwater and possibly Long Swamp (both within PL 260). Impacts could result from removal of habitat, noise and light disturbances. The extent of impacts to the threatened bird species are expected to be minor, specifically as no habitat for this species within Lake Broadwater or Long Swamp will be disturbed.

Mammals

There are no mammals with the potential to occur within the project area.

Ray-finned fishes

The *Maccullochella peelii peelii* (Murray Cod) has the potential to occur within the Condamine River catchment. Potential impacts could occur from a decrease in water quality, elevated turbidity, restriction to fish movements or degradation of habitat. It is not proposed (as part of the project) to restrict the flow in the Condamine River or tributaries, so direct impacts to the species are not expected.

The proposed development of infrastructure for the Theten and Duntroon IPF will not be placed within watercourses. However, potential impacts could occur from decreases in water quality from construction of wells and associated infrastructure in close proximity to watercourses. Proposed measures to avoid or reduce impacts are provided in Section 4.

Reptiles

Two reptile species could potentially occur within the project area. These include the *Anomalopus mackayi* (five-clawed worm-skink), *Furina dunmalli* (Dunmall's snake) and the *Tympanocryptis pinguicolla* (Grassland earless dragon). These species may be impacted through the removal of important habitat to allow for field development and construction of infrastructure.

Dunmall's snake prefers habitat near waterbodies (such as Lake Broadwater). The five-clawed worm-skink and grassland earless dragon prefer 'derived grassland' habitat. Development of infrastructure for the Theten and Duntroon IPF will not occur within watercourses or near waterbodies. However, some field development is likely to occur within derived grassland habitat.

Plants

Nine plant species have the potential to occur within the project area. These are:

- *Acacia chinchillensis* (Chinchilla Wattle).
- *Bothriochloa biloba* (Lobed Blue Grass).
- *Dichanthium queenslandicum* (King blue-grass).
- *Digitaria porrecta* (Finger panic grass).
- *Homopholis belsonii.*
- *Philotheca sporadica.*
- *Picris evae* (Hawkweed).
- *Rhaponticum australe*
- *Thesium australe (*Austral toadflax).

The proposed action could have an impact on threatened plant species from direct clearance for infrastructure or field development or from indirect impacts such as weed infestations.

3.1 (e) Listed migratory species

Description

The EPBC Protected Matters search identified 19 migratory species as being potentially present within 5 km of the project area (Appendix 1). The list is based on the likelihood of occurrence according to distribution of species and their habitats. Table 4 shows the details from the EPBC Protected Matters search and the likelihood of occurrence at the project area using information from literature reviews. Field surveys of the project area were undertaken in October and November 2009, which targeted locating significant species and species habitat.

The bulk of these species are wetland/water species (e.g., waders, sea eagles, egrets) whose distribution within the local area is likely to be restricted or heavily influenced by Lake Broadwater and potentially Long Swamp. Rarely will the species inhabit other areas in the project area.

Table 4 Listed migratory species from EPBC Protected Matters search and the likelihood of occurrence

	Species	Status	Type of presence	Likelihood of occurrence
Migratory Terrestrial Species – Birds	*Haliaeetus leucogaster* White-bellied sea-eagle	Migratory	Species or species habitat likely to occur within area	***Likely:*** The project area contains potential habitat for this species.
	Hirundapus caudacutus White-throated needletail	Migratory	Species or species habitat may occur within area	***Present:*** This species was recorded within the project area during field surveys. Common and widespread.
	Merops ornatus Rainbow bee-eater	Migratory	Species or species habitat may occur within area	***Present:*** This species was recorded within the project area during field surveys. Common and widespread.
	Rhipidura rufifrons Rufous fantail	Migratory	Breeding may occur within area	***Present:*** This species was recorded within the project area during field surveys. The species prefers wet forests, of which there are none in the project area. Transient individuals are present rather than permanent populations.

	Xanthomyza phrygia Regent honeyeater	Migratory	Species or species habitat may occur within area	***Unlikely:*** The habitat for this species consists of dry eucalypt woodland and open forest, woodland, rural and urban areas with mature eucalypts; favours box-ironbark associations. The Regional Ecosystem mapping and field surveys indicate that there is limited habitat in the project area. Transient individuals from the south near Warwick have been recorded previously near the project area, however these are not permanent populations.
Migratory Wetland Species – Birds	*Ardea alba* Great egret, white egret (also the eastern great egret)	Migratory	Species or species habitat may occur within area	***Present***: This species was recorded within the project area during field surveys. Present within nearby waterbodies in the project area.
	Ardea ibis Cattle egret	Migratory	Species or species habitat may occur within area	***Possible***: The habitat within the project area may support the species. It could potentially be present within nearby waterbodies in the project area.
	Gallinago hardwickii Latham's snipe, Japanese snipe	Migratory	Species or species habitat known to occur within area	***Possible***: This is a coastal species. It could potentially be present within nearby waterbodies in the project area.
	Nettapus coromandelianus albipennis Australian cotton pygmy-goose	Migratory	Species or species habitat may occur within area	***Possible***: There are suitable freshwater waterbodies within the project area to support the species. There have previously been records in the general area.

	Limosa limosa Black-tailed godwit	Migratory	Species or species habitat known to occur within area	***Possible:*** There are suitable freshwater waterbodies within the area to support the species. There have previously been records in the general area.
	Nettapus coromandelianus albipennis Australian cotton pygmy-goose	Migratory	Species or species habitat may occur within area	***Possible:*** There is suitable habitat within the project area.
	Rostratula benghalensis s. lat. Painted snipe	Migratory	Species or species habitat may occur within area	***Possible:*** There is suitable habitat within the project area.
	Tringa glareola Wood sandpiper	Migratory	Species or species habitat known to occur within area	***Possible:*** There is suitable habitat within the project area.
	Tringa nebularia Common greenshank, greenshank	Migratory	Species or species habitat known to occur within area	***Possible:*** There is suitable habitat within the project area.
	Tringa stagnatilis Marsh sandpiper, little greenshank	Migratory	Species or species habitat known to occur within area	***Possible:*** There is suitable habitat within the project area.
Migratory Marine Birds	*Apus pacificus* Fork-tailed swift	Migratory	Species or species habitat may occur within area	***Possible:*** This species may migrate through the site to other areas of potential habitat.
	Ardea alba Great egret, white egret	Migratory	Species or species habitat may occur within area	***Possible***: This is a coastal species. It could potentially be present within nearby waterbodies.
	Ardea ibis Cattle egret	Migratory	Species or species habitat may occur within area	***Possible:*** The habitat within the project area may support the species.

Nature and extent of likely impact

Address any impacts on the members of any listed migratory species, or their habitat.

Migratory Terrestrial Species - Birds
The project is unlikely to have a significant impact on threatened migratory terrestrial bird species, as many of these migrate through or fly over the area rather than inhabit the project area on a long term basis.

Migratory Wetland Species – Birds
Migratory wetland species may visit Lake Broadwater and Long Swamp. The proposed development will not impact on the waterbodies or their immediate surrounds, therefore significant impacts to these species are unlikely.

Migratory Marine Birds
These species may fly over the project area. Significant impacts from the project are unlikely.

3.1 (f) Commonwealth marine area
(If the action is in the Commonwealth marine area, complete 3.2(c) instead. This section is for actions taken outside the Commonwealth marine area, that may have impacts on that area.)

Description

None present.

Nature and extent of likely impact

Address any impacts on any part of the environment in the Commonwealth marine area.

3.1 (g) Commonwealth land
(If the action is on Commonwealth land, complete 3.2(d) instead. This section is for actions taken outside Commonwealth land, that may have impacts on that land.)

Description
If the action will affect Commonwealth land also describe the more general environment. The Policy Statement titled *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* provides further details on the type of information needed. If applicable, identify any potential impacts from actions taken outside the Australian jurisdiction on the environment in a Commonwealth Heritage Place overseas.

None present.

Nature and extent of likely impact

Address any impacts on any part of the environment in the Commonwealth land. Your assessment of impacts should refer to the *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* and specifically address impacts on:

- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and the social, economic and cultural aspects of the above things.

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, or actions taken on Commonwealth land

You must describe the nature and extent of likely impacts (both direct & indirect) on the whole environment if your project:

- is a nuclear action;
- will be taken by the Commonwealth or a Commonwealth agency;
- will be taken in a Commonwealth marine area; or
- will be taken on Commonwealth land.

Your assessment of impacts should refer to the *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* and specifically address impacts on:

- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and
- the social, economic and cultural aspects of the above things.

3.2 (a)	**Is the proposed action a nuclear action?**	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (b)	**Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?**	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (c)	**Is the proposed action to be taken in a Commonwealth marine area?**	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))

3.2 (d)	**Is the proposed action to be taken on Commonwealth land?**	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))

3.3 Other important features of the environment

Provide a description of the following features of the project area and the affected area, to the extent not otherwise addressed above.

3.3 (a) Soil and vegetation characteristics

Soils in the project area are dominated by heavy clays, which form rich agricultural soils. These are characterised by self-mulching, cracking clays with a deep profile. The richness of these soils resulted in clearance of the original dense woodland for agriculture. Agricultural practices include irrigation, cropping and cattle grazing. Many paddocks have been laser-levelled to achieve efficient flood irrigation. Soil erosion occurs within the disturbed clay soils, where suitable land management practices have not been adopted. In some areas, deep incised ephemeral channels have formed.

The project area falls within the Brigalow Belt bioregion. This bioregion is characterised by dense woodland and forest communities of Brigalow (*Acacia harpophylla*), with scattered ecosystems dominated by other species including eucalypt and cypress pine, grasslands and other acacia species. Expansive areas of land have been cleared in the region for agricultural purposes. Some tracts of remnant vegetation still exist as intact patches and isolated stands including along riparian systems associated with the Condamine river and tributaries. Figure 10 shows the distribution of Queensland Regional Ecosystems within the project area.

Other large tracts of vegetation include the vegetation within the Barakula State Forest north of Chinchilla (also used as a working forest), and the Braemar and Kumbarilla state forests bordering the project area, west and southwest of Dalby.

3.3 (b) Water flows, including rivers, creeks and impoundments

The Dalby Expansion Project lies within the sub-catchments of the Condamine River as listed below:

- Condamine River.
- Cooranga Creek.
- Braemar Creek.
- Back Creek.
- Jingi Jingi Creek.
- Jimbour Creek.
- Wilkie Creek.
- Moramby Creek.
- Clayhole Creek.
- Myall Creek.
- Oakey Creek.
- Crawlers Creek.
- Kurrawa Creek.
- Willis Creek.
- Ashall Creek.

The Condamine River and its major tributary, Wilkie Creek traverse the project area. Lake Broadwater and Long Swamp are also located within the project area.

Water quality data maintained by the Queensland Department of Environment and Resource Management (DERM) was available for Condamine River, Oakey Creek and Jimbour Creek in the vicinity of the Dalby Expansion Project. The data was reviewed in combination with field survey water quality results to determine the environmental values of the water.

The environmental values considered most appropriate for waters in the Dalby Expansion Project area are:

- Slightly-moderately disturbed waters (creeks and rivers were observed during the field survey to be affected by human activity due to land uses upstream of sites, although sites did not appear sufficiently degraded to consider them highly disturbed waters).

- Domestic water supply.
- Primary industry and agricultural land uses (dominant in the region).

Potential impacts to surface water from project activities have been assessed during preparation of the EM Plan, which is assessed by the Queensland Department of Environment and Resource Management.

3.3 (c) Outstanding natural features, including caves

No outstanding natural features.

3.3 (d) Gradient (or depth range if action to be taken in a marine area)

The gradient within the project area is variable. The minimum elevation is located approximately 320 m AHD within the northern end of the Dalby Expansion Project area, in the vicinity of the Condamine River. The maximum elevation is approximately 440 m ADH located on the edge of the Kumbarilla State Forest approximately 10 km west of Cecil Plains township.

3.3 (e) Buildings or other infrastructure

Various infrastructure is located on the existing PLs and PL(A)s, however none of these hold any significance historically.

Historical sites of significance within the region include the Dalby War Memorial and Memorial Park, which are located within the town of Dalby. Project activities will not impact on this feature.

3.3 (f) Marine areas

There are no marine areas within the vicinity of the project area.

3.3 (g) Kinds of fauna & flora

Significant tracts of fauna habitat occur around the western edges of the project area, southwest of Millmerran, and northeast of Miles. The pattern of habitat mirrors those areas recognised as being of bioregional significance and include wildlife corridors. A major wildlife corridor exists along the riparian margins of the Condamine River.

A total of 257 vascular flora species were recorded during the 2009 field survey including two ferns, two gymnosperms and 253 flowering plants. Preliminary mapping of habitat for significant species has been undertaken and is provided in Appendix 2.

A total of 132 vertebrate species were observed during the survey including one frog, 17 reptiles, 103 birds and 11 mammals. A list of species recorded during the survey is provided in Appendix 2.

3.3 (h) Current state of the environment in the area
Include information about the extent of erosion, whether the area is infested with weeds or feral animals and whether the area is covered by native vegetation or crops.

The project area is centred around the broad alluvial plain of the Condamine River and its associated tributaries. The productivity of the alluvial clay soils on the flood plain has resulted in heavy utilisation of these areas for agricultural purposes (predominantly tilled cropping) and remnant vegetation is largely restricted to narrow discontinuous strips along roadsides and drainage lines, or as isolated fragments on soils of less favourable physical properties. Continuous tracts of remnant vegetation associated with Braemar and Kumbarilla State Forests to the west intrude into the project area notably near PL 198 and the western edge of PL 230.

Four weeds declared under the Queensland *Land Protection (Pest and Stock Route Management) Act 2002*, were observed in the project area during field surveys. These were *Opuntia stricta* (prickly pear), *Opuntia tomentosa* (velvet pear), *Harrisia martini* (harrisia cactus) and *Bryophyllum delagoensis* (mother of millions).

Fifteen exotic vertebrate species are known to occur within the project area. Many of these pests (cane toad, house mouse, rock dove, common mynah) are abundant.

3.3 (i) Other important or unique values of the environment

Describe any other key features of the environment affected by, or in proximity to the proposed action (for example, any national parks, conservation reserves, wetlands of national significance etc).

The following parks and forests (see Figure 11) are located within the project area:

- Dalby State Forest within PL 194.
- Condamine Park (Karana) is located within PL(A) 260.
- Lake Broadwater Conservation Park within PL(A) 260 and PL 198. This site has been identified as possessing ecological values of state significance relating to special biodiversity values (wildlife refugia). The site is habitat for two rare flora species listed on the *Nature Conservation Act 1992,* and is listed as a 'Nationally Important Wetland' (Environment Australia, 2001).
- Braemar State Forest on the boundary of PL 230.

The following state forests are located outside of the project area:

- Daandine State Forest.
- Kumbarilla State Forest.
- Dunmore State Forest.
- Waar Waar State Forest.
- Western Creek State Forest.
- Wondul Range National Park.
- Bulli State Forest.

3.3 (j) Tenure of the action area (eg freehold, leasehold)

The land within the project area is predominantly freehold with some reserves (conservation reserve and National park).

3.3 (k) Existing land/marine uses of area

The Dalby Expansion Project area is surrounded by existing petroleum operations and exploration activities. Agricultural practices are also undertaken, which include irrigation, cropping and cattle grazing.

3.3 (l) Any proposed land/marine uses of area

The proposed use of the land is for gas field development and infrastructure, as detailed in Section 2.

4 Measures to avoid or reduce impacts

The Australian Government Environment Minister may decide that a proposed action is not likely to have significant impacts on a protected matter, as long as the action is taken in a particular manner (section 77A of the EPBC Act). The particular manner of taking the action may avoid or reduce certain impacts, in such a way that those impacts will not be 'significant'. More detail is provided in the *Guideline on Particular Manner Decisions under the EPBC Act* available at the Department's web site.

For the Minister to make such a decision (under section 77A), the proposed measures to avoid or reduce impacts must:

- clearly form part of the referred action (eg be identified in the referral and fall within the responsibility of the person proposing to take the action),
- be must be clear, unambiguous, and provide certainty in relation to reducing or avoiding impacts on the matters protected, and
- must be realistic and practical in terms of reporting, auditing and enforcement.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of habitat important, specific design measures, or adoption of specific work practices.

More general commitments (eg preparation of management plans or monitoring) and measures aimed at providing environmental offsets, compensation or off-site benefits CANNOT be taken into account in making the intial decision about whether the proposal is likely to have a significant impact on a matter protected under the EPBC Act. (But those commitments may be relevant at the later assessment and approval stages if your proposal proceeds to these stages.) Refer to the Guideline on Particular Manner Decisions under the EPBC Act available at the Department's web site.

For any measures intended to avoid or mitigate significant impacts on matters protected under the EPBC Act, specify:

- what the measure is,
- how the measure is expected to be effective, and
- the timeframe or workplan for the measure.

To ensure an understanding of EPBC Act listed communities and to provide accurate mapping, 3D Environmental (2009) undertook field surveys of the project area. Appendix 2 contains the report which provides a detailed assessment of the likelihood of impacts from the project.

The proposed action by Arrow to continue coal seam gas development in the Surat Basin by expansion of existing facilities and associated infrastructure will not have a significant impact on threatened communities and species listed under the EPBC (including migratory birds).

It is not proposed to clear any Brigalow communities for the Dalby Expansion Project.

Site Selection

Site selection has been the primary mitigation for avoiding and reducing impacts on EPBC Act listed threatened communities and species.

The project area contains many suitable development sites that avoid large remnants of native vegetation and therefore avoid adverse impacts to significant species. Infrastructure locations have been selected to avoid EPBC Act listed communities. Figures 6, 7 and 8 show the existing EPBC act listed communities and the proposed locations of infrastructure at the Theten IPF, Duntroon IPF and Lynwood North IPF sites.

Field development site selection is dependant upon the geological properties of the underlying strata, and ongoing collection of gas reservoir data. The proposed well site areas are shown in Figure 9. There are six key well development areas, each of which is proposed to contain approximately 50 wells. Most of these well site areas are in locations that have no EPBC Act listed communities mapped and very little native vegetation. The well development areas within PL 252 and PL 260 are the only sites with the brigalow community in the vicinity. There are two well site areas in the north (PL 194) and south (PL 258) which fall within areas of remnant native vegetation (not EPBC Act communities). The well site areas in PL 252 and PL 260 do contain brigalow, however it will be possible to avoid these locations.

Although the geology restricts the location of the wells to some extent, spacing between wells will ideally range from 700 m to 1000 m, hence there is scope to reposition proposed well sites to avoid sensitive areas at the surface. The maximum disturbance area for each new well site will be approximately 60 m by 70 m, this will be reduced to approximately 10 m by 10 m when the well is completed. Prompt rehabilitation after construction will also be undertaken.

The proposed high pressure gas pipeline connecting proposed facilities to sales gas infrastructure also falls within areas of remnant native vegetation and within the vicinity of mapped EPBC Act listed communities. The pipeline right of way width can be reduced or the alignment slightly shifted (where possible) to avoid such impacts.

The gas pipeline to sales infrastructure (Figure 9) alignment runs within close proximity to patches of brigalow in five locations. These locations are highlighted on the figure as locations 1 through to 5. Avoidance of these locations will be achievable by undertaking the measures discussed below:

- Location 1 – the alignment passes to the immediate east of a small patch of brigalow. The right of way will be reduced in width in this vicinity to avoid impacting on this area.
- Location 2 – the alignment passes to the immediate west of this small regrowth brigalow community. There is sufficient distance to avoid the patch at this location.
- Location 3 – the alignment passes to the immediate west of a small area of remnant brigalow. The right of way will be reduced in width in this vicinity to avoid impacting on this area.
- Location 4 – the alignment passes to the immediate east of a small patch of regrowth brigalow. There is sufficient distance to avoid the patch.
- Location 5 – the alignment passes within 80 m of a remnant patch of brigalow. A reduced width right of way and a 'no go' buffer zone will be established around this community to avoid adverse impacts.

Final site selection will be refined in consultation with a suitably qualified ecologist to ensure avoidance of all fragments.

Adherence to detailed site selection procedures and environmental management plans for construction and operation will ensure sensitive sites are protected and that appropriate measures are in place. Procedures will involve site selection criteria dependent upon the environmental conditions, and a set of minimum acceptable standards will be applied across all sites and facilities. Sites with moderate or high environmental constraints will have significantly higher environmental management requirements. This will be managed with a set of environmental management standard operating procedures (provided within the Appendices 3 – 7), to be held at an Arrow corporate level and implemented at sites. Accurate vegetation mapping over areas subject to immediate potential impact will be undertaken at a scale suitable for site specific planning prior to any development.

Once gas reserves within an area are proven viable, and a well site location (and gas and water gathering lines and access tracks) are finalised, the site will be assessed as to whether the location is ideal and has the lowest possible impact on the environment. The following aspects will be assessed and the site moved to a more suitable location if possible.

- Whether the site is within previous clearings or non-remnant vegetation or along existing easements.
- If the location has an adequate buffer distance to remnant vegetation or natural wetlands or watercourses (using the generic recommendations made the 'Regional Vegetation Management Code for Brigalow Belt and New England Tableland (DNR&W, 2006)). Specifically clearance will not occur within 100 m of any natural wetland (Long Swamp) within 200 m of any natural significant wetland (Lake Broadwater), other than clearing for pipelines and access tracks.
- Whether innovative solutions such as non-linear corridors (i.e. curves and bends around patches) can be used.
- Whether the track location can avoid the repeated isolating of small parcels of remnant vegetation from more continuous tracts.

- Whether methods to avoid high density well siting (e.g., horizontal drilling) can be used.

Once a location has been finalised, pre-construction/ pre-clearing surveys in habitats with potential for EPBC Act listed flora or fauna species within the vicinity of disturbance areas will be undertaken. The procedures for well site location are continually refined to ensure all environmental and social constraints are considered.

Additional Mitigation Measures

As detailed above, disturbance to populations of EPBC Act flora and fauna habitat will be avoided, by careful consideration to infrastructure site selection, field development and pipeline alignment. In addition to avoidance measures, mitigation measures are also proposed to reduce potential indirect adverse impacts. Environmental management standard operating procedures (SOPs) have been developed which outline the environmental protection objectives, responsibilities and procedures to avoid and minimize impacts to the various aspects of the environment. The relevant SOPs for matters of national environmental significance are:

- SOP Vegetation and Habitat (Appendix 3)
- SOP Ground Disturbance and Erosion (Appendix 4)
- SOP Weed and Pathogen (Appendix 5)
- SOP Wildlife and Stock (Appendix 6)
- SOP Rehabilitation (Appendix 7)

Flora

Vegetation disturbance will be minimised wherever possible. Well gathering corridors will be as narrow as possible, particularly when crossing linear corridors of vegetation (e.g. Condamine, Wilkie Creek and some roadside reserves). Well sites will also be as small as possible (with consideration to safety measures). Unintended clearance will be avoided by:

- Using appropriate buffer zones.
- Ensuring all workers including contract plant and machinery operators are aware of the location of significant remnant vegetation and are guided by qualified personnel when clearing is undertaken.
- Marking all disturbance areas on the ground prior to clearing to ensure unnecessary or unintended impact is avoided.

Edge effects on native vegetation will be reduced by retaining woody debris, logs and rocks for rehabilitation and piling the items along the edge of the cleared corridor, where possible. This will also provide refugia for crossing fauna.

To reduce weed spread, all machinery involved in clearing vegetation and trench construction (including light vehicles) will be thoroughly washed prior to site access.

Fauna

Capture of terrestrial animals in open trenches poses a potential impact to both common and EPBC Act listed species. Several strategies will be used to avoid these impacts including:

- Minimising the time trenches are open. Laying and burying of pipes to occur as soon as possible after the trench has been created.
- Construction of exit points along the trench when it passes through or is within 1 km of native vegetation. Exit points will be created by digging a sloped ramp approximately 0.5-1 m wide from the bottom of the trench to the surface. Trapped animals (e.g. wallabies, bettongs) may use these to exit the trench.
- Trenches will be checked and trapped frogs, lizards, snakes, mammals (e.g.) and removed on a daily basis prior to laying pipes and closing trenches (i.e. shortly after sunrise). Captured animals will be relocated to nearby vegetation.

- Machinery operators will be advised to keep vigilant watch for any injured vertebrates (including snakes and lizards) resulting from clearing activities. Injured wildlife will then receive veterinarian treatment.
- Sediment controls and buffer zones will be implemented when working near watercourses to avoid or reduce impacts to water quality and fish.

5 Conclusion on the likelihood of significant impacts

Identify whether or not you believe the action is a controlled action (ie. whether you think that significant impacts on the matters protected under Part 3 of the EPBC Act are likely) and the reasons why.

5.1 Do you THINK your proposed action is a controlled action?

X	No, complete section 5.2
	Yes, complete section 5.3

5.2 Proposed action IS NOT a controlled action.

Specify the key reasons why you think the proposed action is NOT LIKELY to have significant adverse impacts on a matter protected under the EPBC Act.

The proposed action by Arrow to continue coal seam gas development in the Surat Basin by expansion of existing facilities and associated infrastructure will not have a significant impact on threatened communities and species (including migratory birds) listed under the EPBC Act because it will not:

- **Lead to a long-term decrease in the size of a population.** Proposed mitigation measures will avoid or minimise impacts on known EPBC Act listed species and habitat or listed species with the potential to occur in remnant vegetation. The proposed activities will not lead to a long-term decrease in population sizes of the identified species.

- **Fragment an existing population into two or more populations.** Although construction of coal seam gas production infrastructure and access tracks through remnant vegetation may result in segmenting intact stands, the extent of disturbance, limited by the application of stringent environmental controls, is unlikely to cause fragmentation of existing populations.

- **Adversely affect habitat critical to the survival of a species.** The extent of vegetation to be cleared to construct and operate the project will not adversely affect critical habitat for the survival of known species and species that might occur in the area. Site selection processes for field development will result in the avoidance or minimisation of unnecessary vegetation clearance.

- **Disrupt the breeding cycle of a known population.** The proposed activities will not affect any known nesting roosts or areas of species found or with the potential to occur in the project area. Water bodies will not be affected by the proposed development activities.

- **Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.** Some potential habitat (such as grassland) for both flora and fauna species will be affected by the proposed activities but not to the extent that the disturbance would significantly reduce the amount of remnant vegetation leading to a likely decline in its extent and quality or a decline in fauna abundance.

- **Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.** Weed management measures will ensure the introduction and spread of weeds is controlled.

- **Interfere with the recovery of a species.** The proposed site selection process and field development procedures, in addition to proposed mitigation measures will avoid or minimise impacts on listed threatened species and communities known or likely to occur in the project area and hence do not exacerbate the threatening processes.

5.3 Proposed action IS a controlled action

Type 'x' in the box for the matter(s) protected under the EPBC Act that you think are likely to be adversely impacted. (The 'sections' identified below are the relevant sections of the EPBC Act.)

	Matters likely to be impacted
	World Heritage values (sections 12 and 15A)
	National Heritage places (sections 15B and 15C)
	Wetlands of international importance (sections 16 and 17B)
	Listed threatened species and communities (sections 18 and 18A)
	Listed migratory species (sections 20 and 20A)
	Protection of the environment from nuclear actions (sections 21 and 22A)
	Commonwealth marine environment (sections 23 and 24A)
	Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)
	Protection of the environment from Commonwealth actions (section 28)
	Commonwealth Heritage places overseas (sections 27B and 27C)

Specify the key reasons why you think the proposed action is likely to have a significant adverse impact on the matters identified above.

6 Environmental history of the responsible party

NOTE: If a decision is made that a proposal needs approval under the EPBC Act, the Environment Minister will also decide the assessment approach. The EPBC Regulations provide for the environmental history of the party proposing to take the action to be taken into account when deciding the assessment approach.

		Yes	No
6.1	**Does the party taking the action have a satisfactory record of responsible environmental management?** **Provide details** Arrow Energy operates in a manner that protects and promotes the health and well-being of the environment. The company has maintained a clean environmental record since its foundation in 2000.	X	
6.2	**Has the party taking the action ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?** **If yes, provide details**		X
6.3	**If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?** **If yes, provide details of environmental policy and planning framework** Arrow Energy has an Integrated Environmental Management System, which promotes continual improvement of environmental performance. Audits and self-assessments are undertaken to ensure compliance with this system.	X	
6.4	**Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?** **Provide name of proposal and EPBC reference number (if known)** Tipton Gas Field Gas Pipeline - A referral was submitted by Arrow Energy for a 145 km buried gas pipeline from the Tipton Gas Field to supply the town of Dalby, Oakley and Wambo in QLD. The referral reference is EPBC 2004/1797. The decision of the referral was a 'not controlled action' dated 19 October 2004. Surat to Gladstone Pipeline – this proposed high pressure gas pipeline will transport gas from near Kogan North in the Surat Basin to Gladstone on the Queensland coast. To be constructed and operated by Surat Gladstone Pipeline Pty Ltd (a wholly-owned subsidiary of Arrow Energy). An EPBC Act referral (2009/5029) has been submitted for the project which was declared a controlled action on 15 October 2009. Assessment on preliminary information was nominated as the appropriate level of assessment for potential significant impacts on listed threatened species and communities (Sections 18 and 18A). Surat Gas Project – Arrow Energy proposes to submit an EPBC Act referral for the Surat Gas Project concurrently with this referral for the Dalby Expansion Project.	X	

7 Information sources and attachments

(For the information provided above)

7.1 References

- List the references used in preparing the referral.
- Highlight documents that are available to the public, including web references if relevant.

3D Environmental in association with Osmotic Ecology. 2009. Ecological values within areas under existing environmental authority application; Arrow Energy Surat Gas Project.

Department of the Environment, Water, Heritage and the Arts (DEWHA). 1999. Information Sheet on RAMSAR Wetlands – Narran Lake Nature Reserve 53.

Department of Natural Resources and Water (DNR&W). 2006. Regional Vegetation Management Code for Brigalow Belt and New England Tablelands Bioregion. Queensland Government, Brisbane.

Environment Australia (2001). *A Directory of Important Wetlands in Australia, Third Edition.* Environment Australia, Canberra.

WWF. 2008. Draft Queensland Brigalow Belt Reptile Recovery Plan 2007-2011. Report to the Department of the Environment and Heritage, Canberra. Australia.

7.2 Reliability and date of information

For information in section 3 specify:

- source of the information;
- how recent the information is;
- how the reliability of the information was tested; and
- any uncertainties in the information.

7.3 Attachments

Indicate the documents you have attached. All attachments must be less than two megabytes (2mb) so they can be published on the Department's website. Attachments larger than two megabytes (2mb) may delay the processing of your referral.

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	✓	Figure 1 – Dalby expansion project development areas.
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	Figure 2 – Current field development information. Figure 3 –Proposed additional field development. Figure 4 –Arrow Energy Surat Gas and Dalby Expansion Project areas. Figure 5 – EPBC Act listed ecological communities: Dalby Expansion Project. Figure 6 - EPBC Act listed ecological communities: Proposed Theten facilities. Figure 7 - EPBC Act listed ecological communities: Proposed Duntroon facilities.

			Figure 8 - EPBC Act listed ecological communities: Proposed Lynwood North (option) facilities. Figure 9 - EPBC Act listed ecological communities: Proposed connection pipeline and well areas. Figure 10 – Regional Ecosystems: Dalby Expansion Project. Figure 11 – Parks and Forests.
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.3)		
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.4)		
	copies of any flora and fauna investigations and surveys (section 3)	✓	Appendix 2
	technical reports relevant to the assessment of impacts on protected matters and that support the arguments and conclusions in the referral (section 3 and 4)	✓	Appendix 2 Appendix 3 Appendix 4 Appendix 5 Appendix 6 Appendix 7
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		

8 Contacts, signatures and declarations

NOTE: Providing false or misleading information is an offence punishable on conviction by imprisonment and fine (s 489, EPBC Act).

Under the EPBC Act a referral can only be made by:

- the person proposing to take the action (which can include a person acting on their behalf); or
- a Commonwealth, state or territory government, or agency that is aware of a proposal by a person to take an action, and that has administrative responsibilities relating to the action[1].

Project title:

8.1 Person proposing to take action

This is the individual, government agency or company that will be principally responsible for, or who will carry out, the proposed action.

If the proposed action will be taken under a contract or other arrangement, this is:

- the person for whose benefit the action will be taken; or
- the person who procured the contract or other arrangement and who will have principal control and responsibility for the taking of the proposed action.

The Minister may also request relevant additional information from this person.

If further assessment and approval for the action is required, any approval which may be granted will be issued to the person proposing to take the action. This person will be responsible for complying with any conditions attached to the approval.

If the Minister decides that further assessment and approval is required, the Minister must designate a person as a proponent of the action. The proponent is responsible for meeting the requirements of the EPBC Act during the assessment process. The proponent will generally be the person proposing to take the action[2].

Name	s. 47F(1)
Title	Environment Manager
Organisation	Arrow Energy
ACN / ABN (if applicable)	73 078 521 936
Postal address	Level 19, AM60 42-60 Albert Street Brisbane Qld 4000 AUSTRALIA
Telephone	s. 47F(1)
Email	s. 47F(1)@arrowenergy.com.au
Declaration	I declare that the information contained in this form is, to my knowledge, true and not misleading. I agree to be the proponent for this action.
Signature	s. 47F(1) Date 27/1/10

[1] *If the proposed action is to be taken by a Commonwealth, state or territory government or agency, section 8.1 of this form should be completed. However, if the government or agency is aware of, and has administrative responsibilities relating to, a proposed action that is to be taken by another person which has not otherwise been referred, please contact the Referrals Business Entry Point (1800 803 772) to obtain an alternative contacts, signatures and declarations page.*

[2] *If a person other than the person proposing to take action is to be nominated as the proponent, please contact the Referrals Business Entry Point (1800 803 772) to obtain an alternative contacts, signatures and declarations page.*

8.2 Person preparing the referral information (if different from 8.1)

Individual or organisation who has prepared the information contained in this referral form.

Name	s. 47F(1)
Title	Senior Consultant
Organisation	Coffey Natural Systems
Postal address	Level 21, 12 Creek Street Brisbane, QLD 4000
Telephone	s. 47F(1)
Email	s. 47F(1) r@coffey.com
Declaration	I declare that the information contained in this form is, to my knowledge, true and not misleading.
Signature	s. 47F(1) Date 27/1/10

If the referring party is a small business (fewer than 20 employees), estimate the time taken, in hours and minutes, to complete this form (include your time reading the instructions, working on the questions and obtaining the information and time spent by all employees in collecting and providing this information).

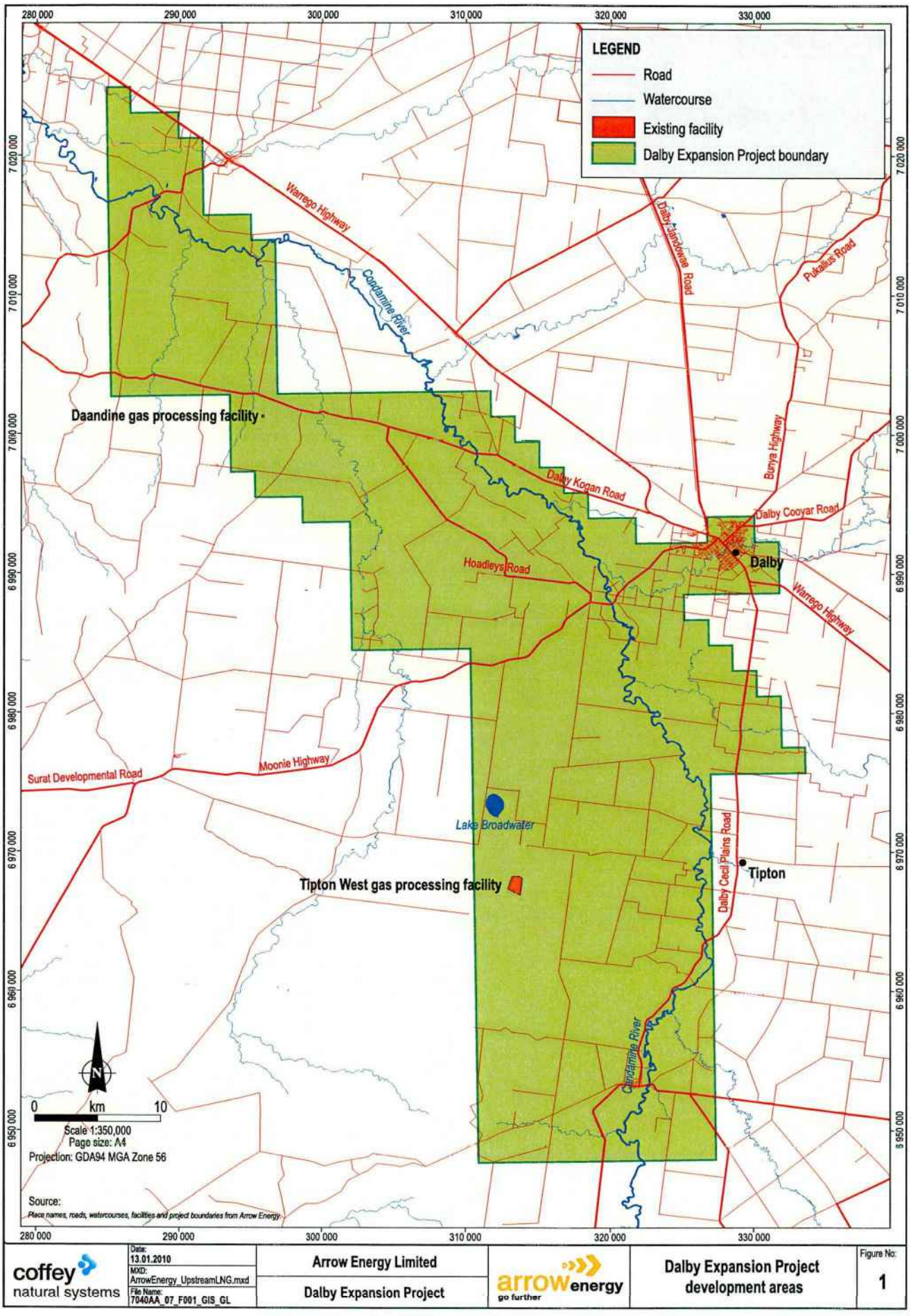
Hours	Minutes

REFERRAL CHECKLIST

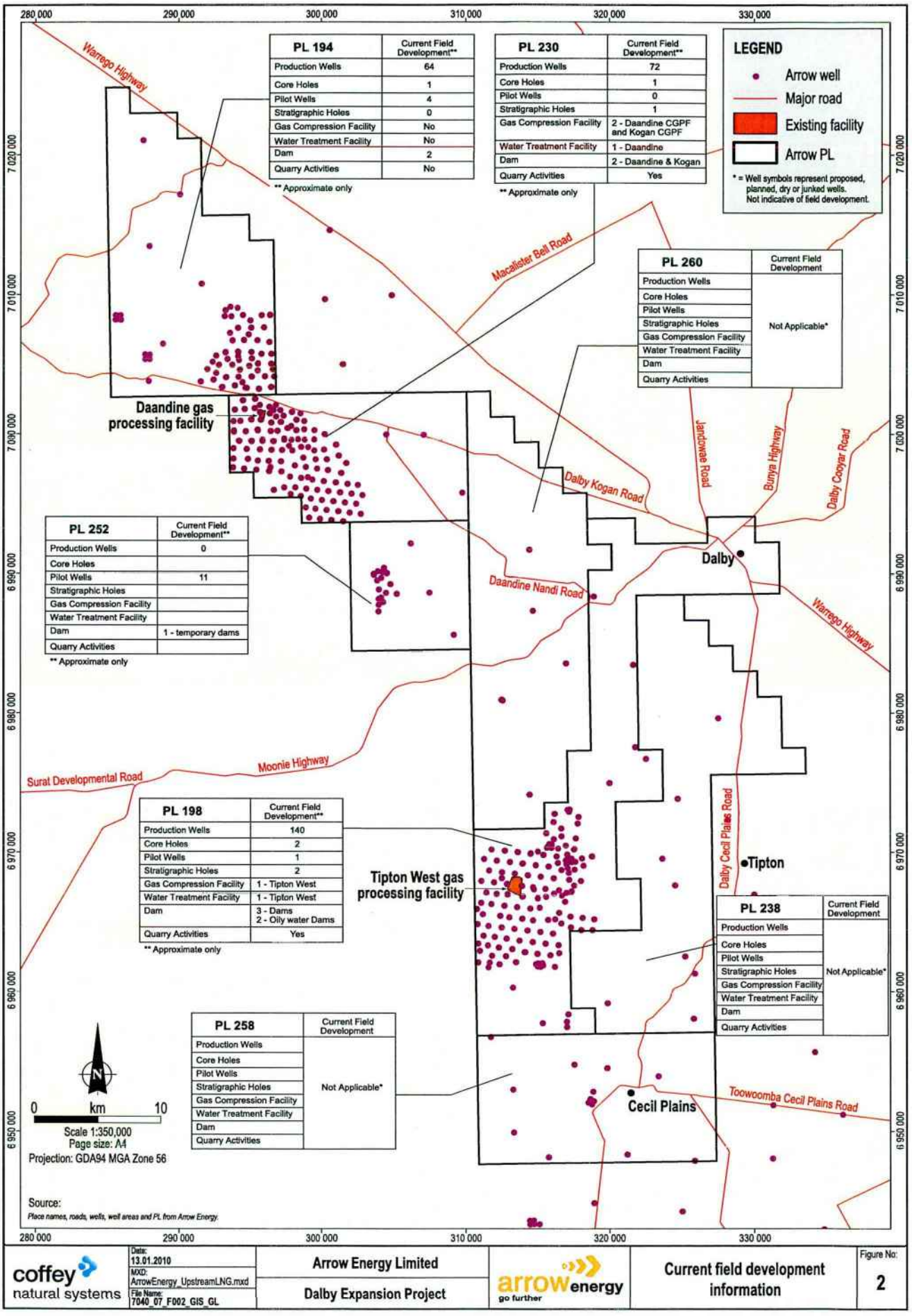
NOTE: This checklist is to help ensure that all the relevant referral information has been provided. It is not a part of the referral form and does not need to be sent to the Department.

HAVE YOU:

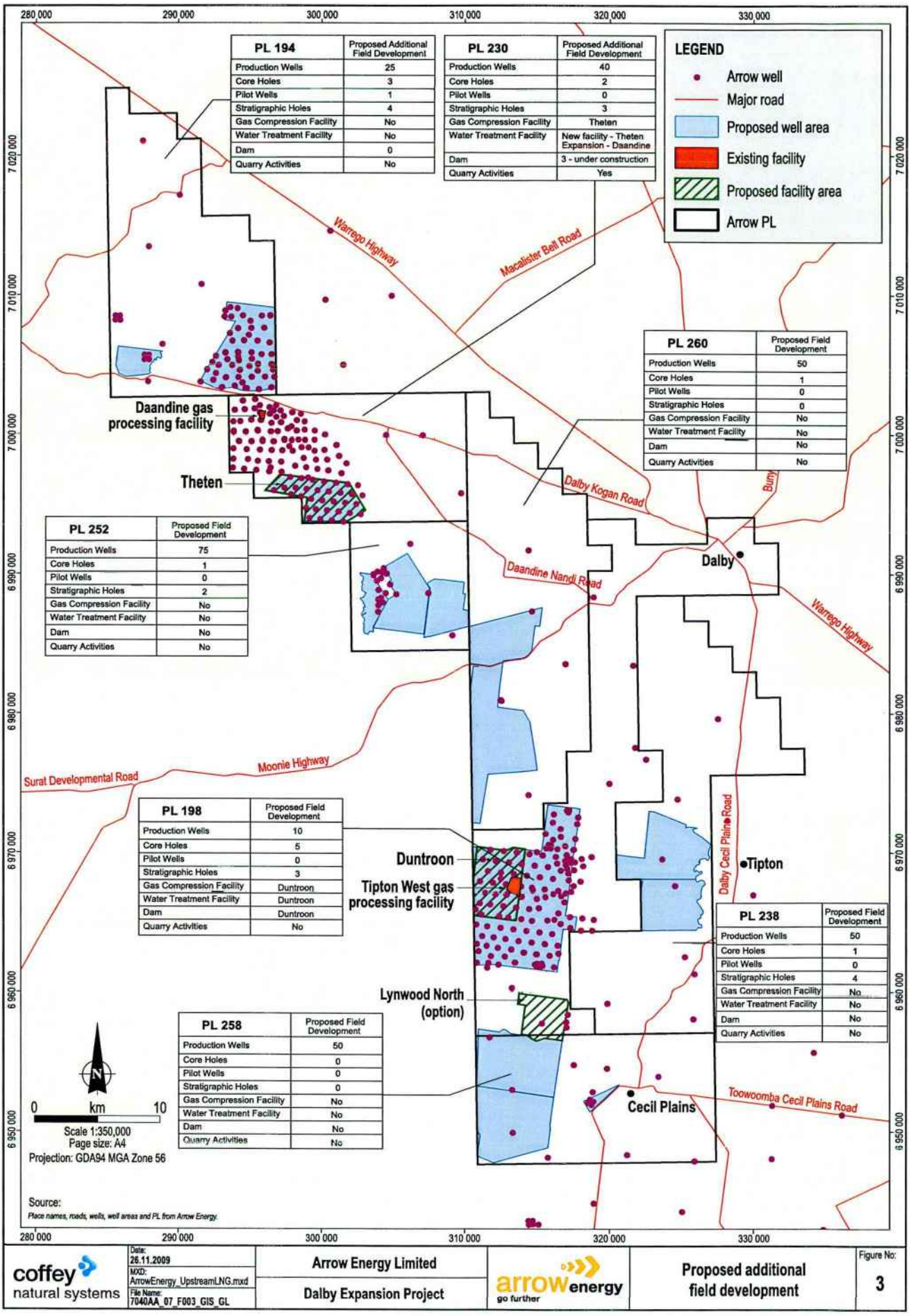
- ☐ Completed all required sections of the referral form?
- ☐ Included accurate coordinates (to allow the location of the proposed action to be mapped)?
- ☐ Provided a map showing the location and approximate boundaries of the project area?
- ☐ Provided a map/plan showing the location of the action in relation to any matters of NES?
- ☐ Provided complete contact details and signed the form?
- ☐ Provided copies of any documents referenced in the referral form?
- ☐ Ensured that all attachments are less than two megabytes (2mb)?
- ☐ Sent the referral to the Department (electronic and hard copy preferred)?



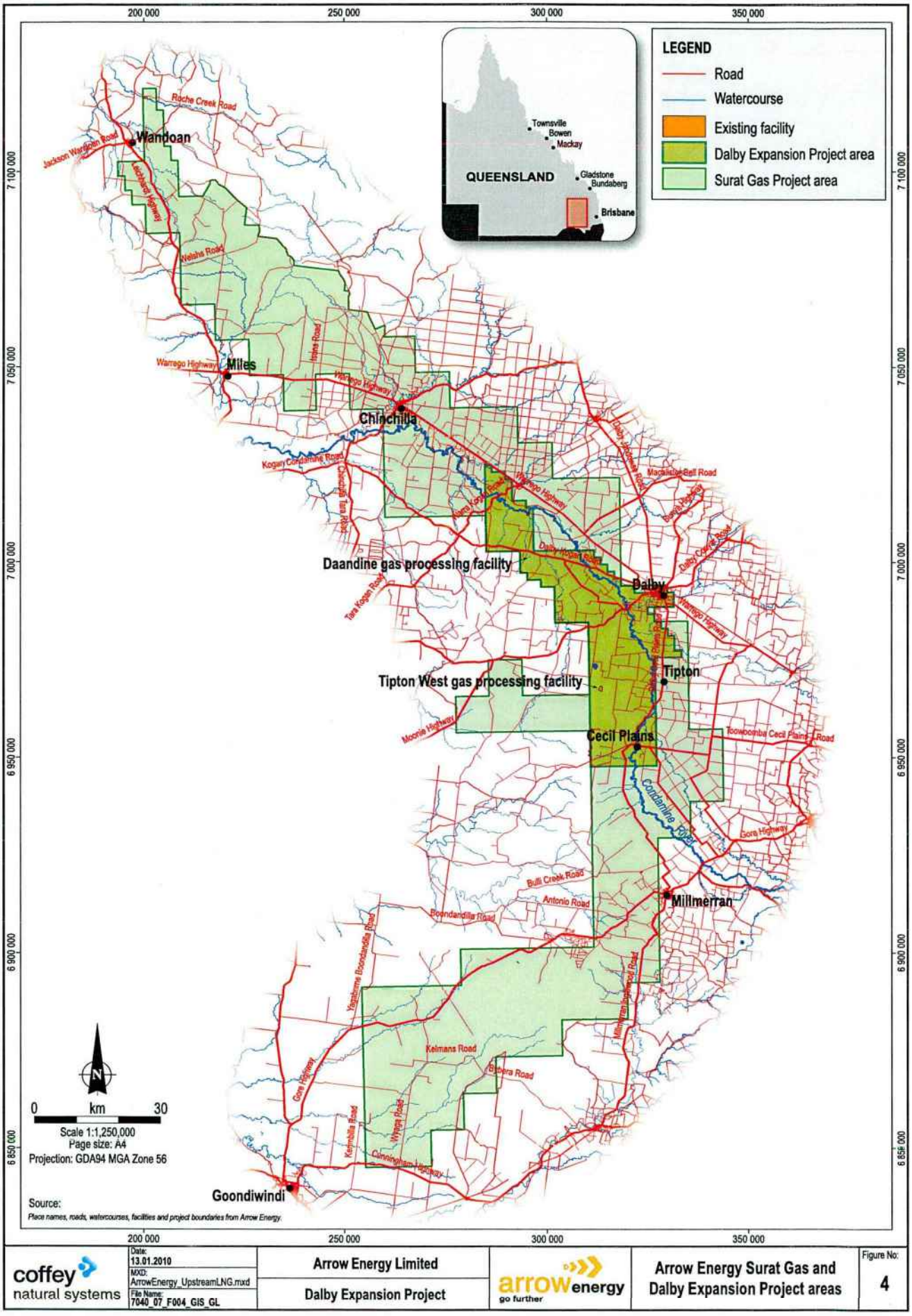
coffey natural systems	Date: 13.01.2010 MXD: ArrowEnergy_UpstreamLNG.mxd File Name: 7040AA_07_F001_GIS_GL	Arrow Energy Limited Dalby Expansion Project	arrow energy go further	Dalby Expansion Project development areas	Figure No: 1



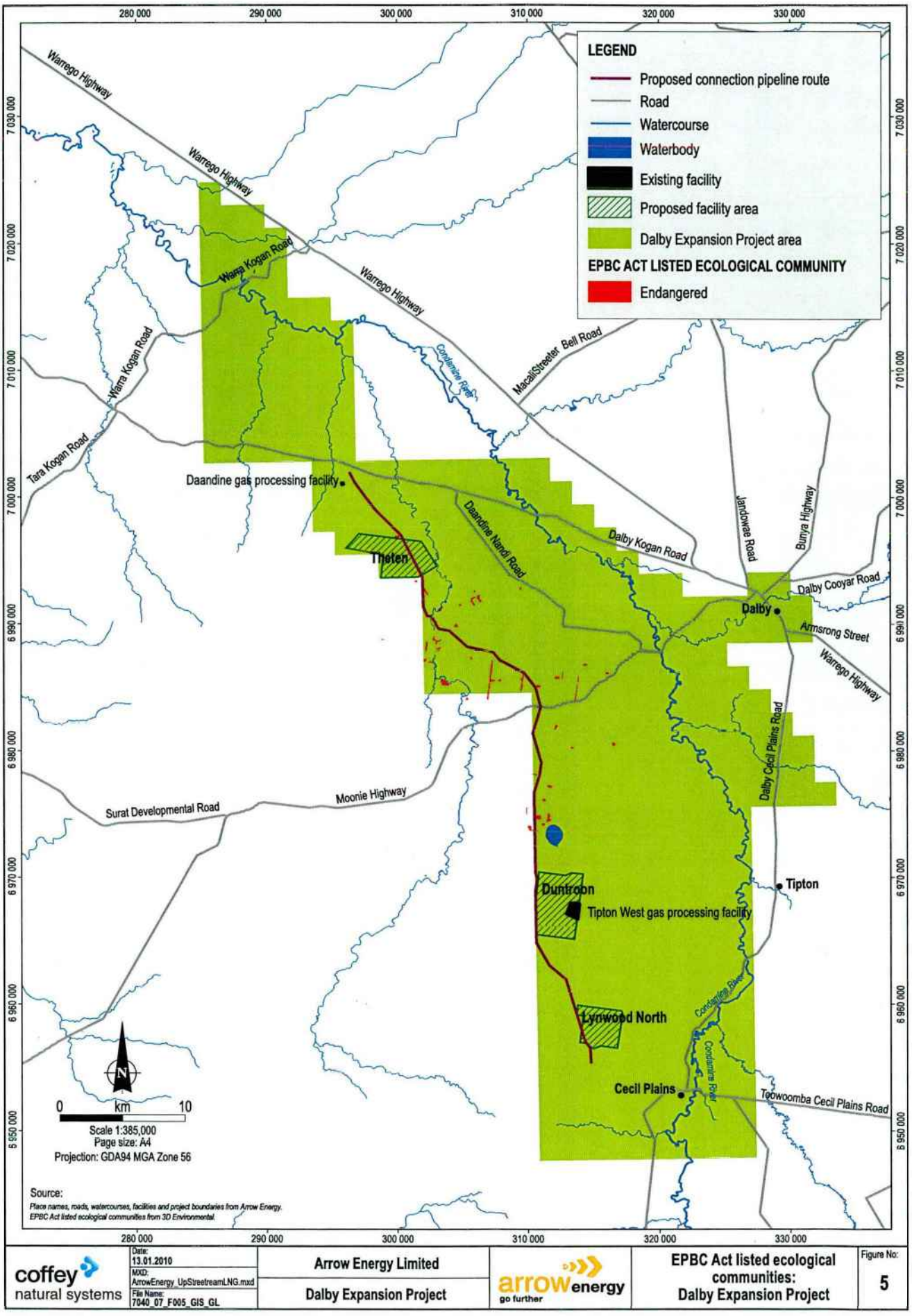
coffey natural systems	Data: 13.01.2010 MXD: ArrowEnergy_UpstreamLNG.mxd File Name: 7040_07_F002_GIS_GL	Arrow Energy Limited Dalby Expansion Project	arrow energy go further	Current field development information	Figure No: 2



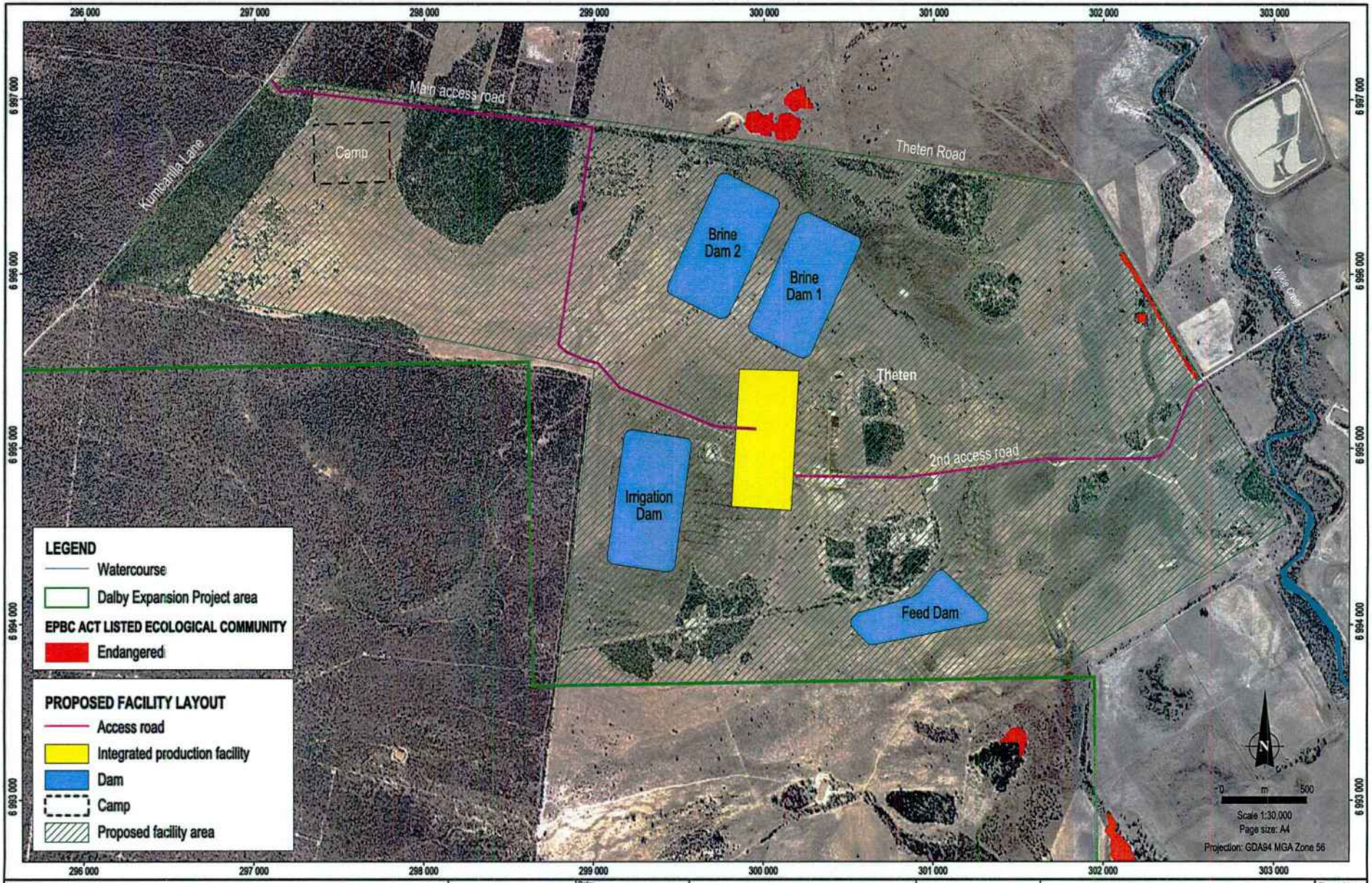
coffey natural systems	Date: 26.11.2009 MXD: ArrowEnergy_UpstreamLNG.mxd File Name: 7040AA_07_F003_GIS_GL	Arrow Energy Limited Dalby Expansion Project	arrow energy go further	Proposed additional field development	Figure No: 3



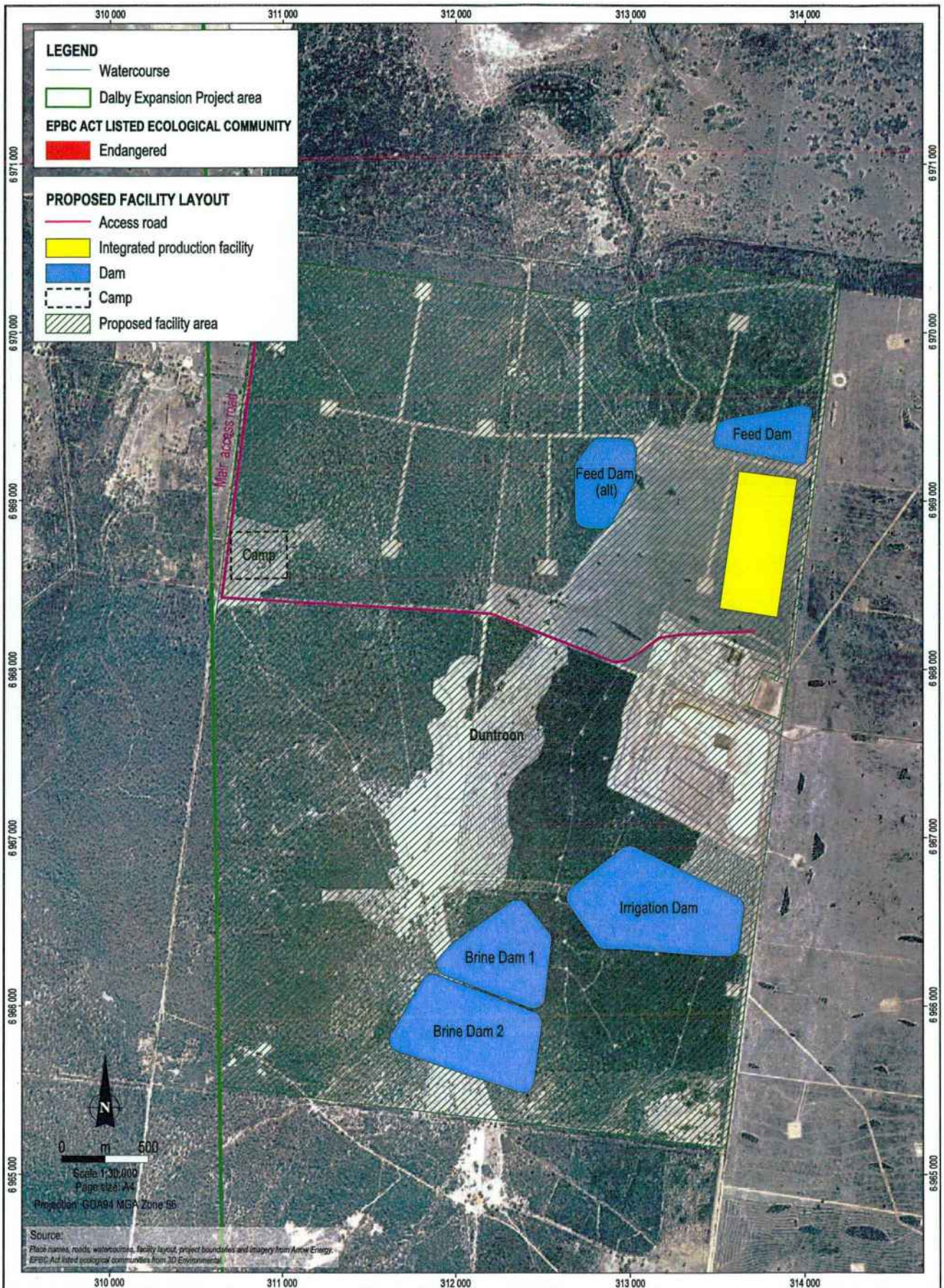
coffey natural systems	Date: 13.01.2010 MXD: ArrowEnergy_UpstreamLNG.mxd File Name: 7040_07_F004_GIS_GL	Arrow Energy Limited Dalby Expansion Project	arrow energy go further	Arrow Energy Surat Gas and Dalby Expansion Project areas	Figure No: 4



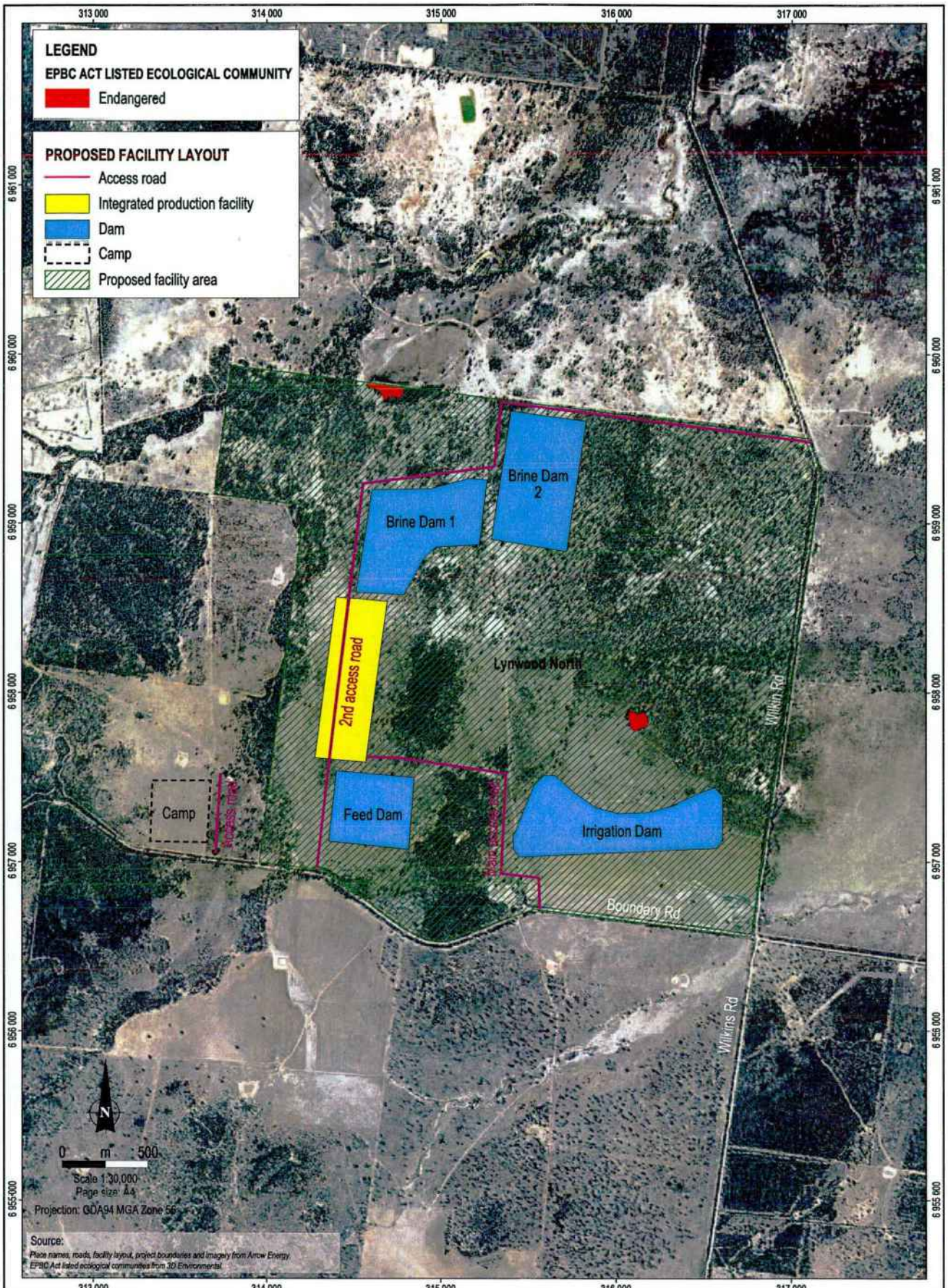
coffey natural systems	Date: 13.01.2010 MXD: ArrowEnergy_UpStreetreamLNG.mxd File Name: 7040_07_F005_GIS_GL	Arrow Energy Limited Dalby Expansion Project	arrow energy go further	EPBC Act listed ecological communities: Dalby Expansion Project	Figure No: 5



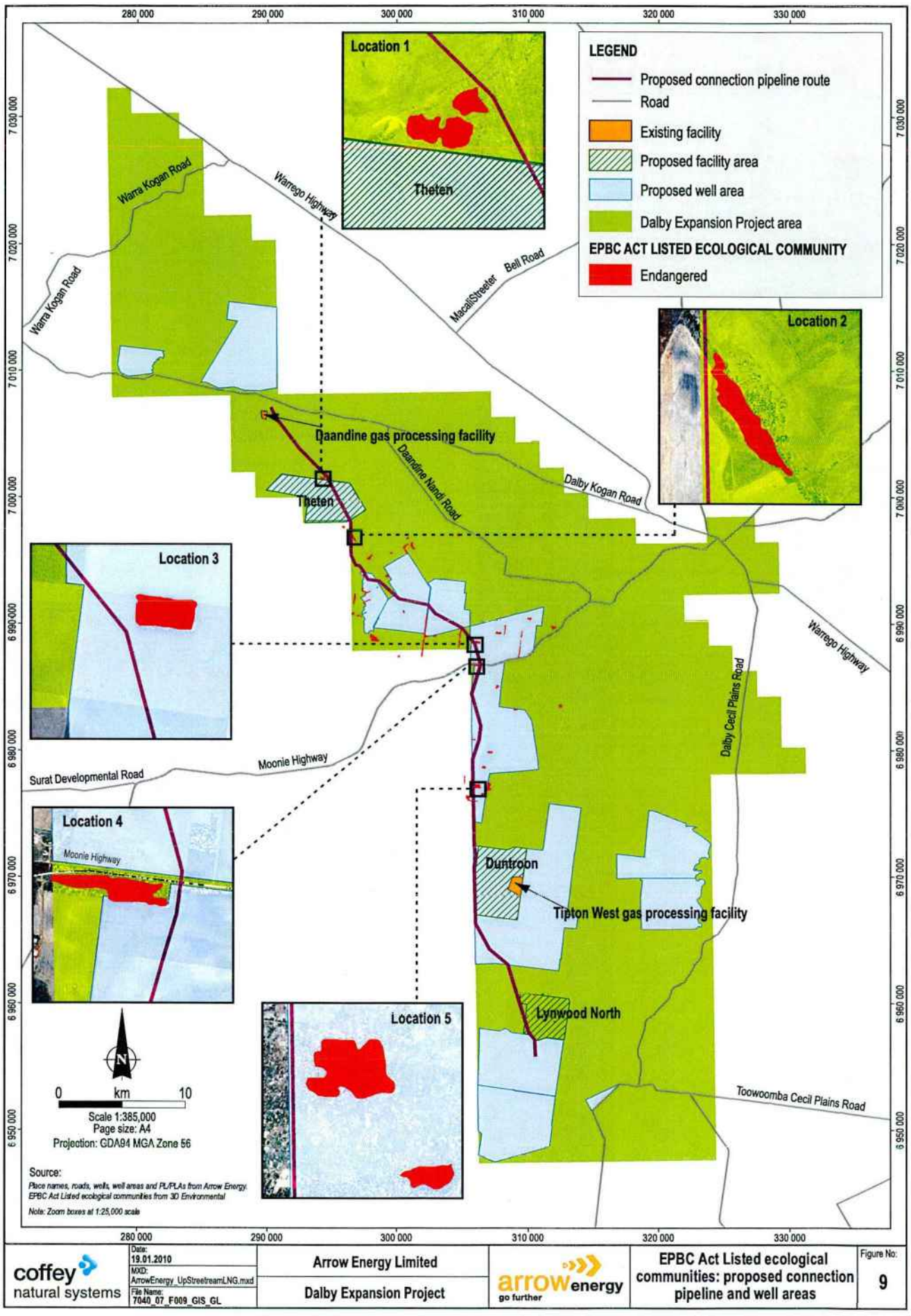
Source: Place names, roads, facility layout, project boundaries and imagery from Arrow Energy. EPBC Act listed ecological communities from 3D Environmental.	coffey natural systems	Date: 30.11.2009 MXD: ArrowEnergy_UpstreamLNG.mxd File Name: 7040_07_F006_GIS_GL	Arrow Energy Limited Dalby Expansion Project	arrow energy go further	EPBC Act listed ecological communities: Proposed Theten facilities	Figure No: 6



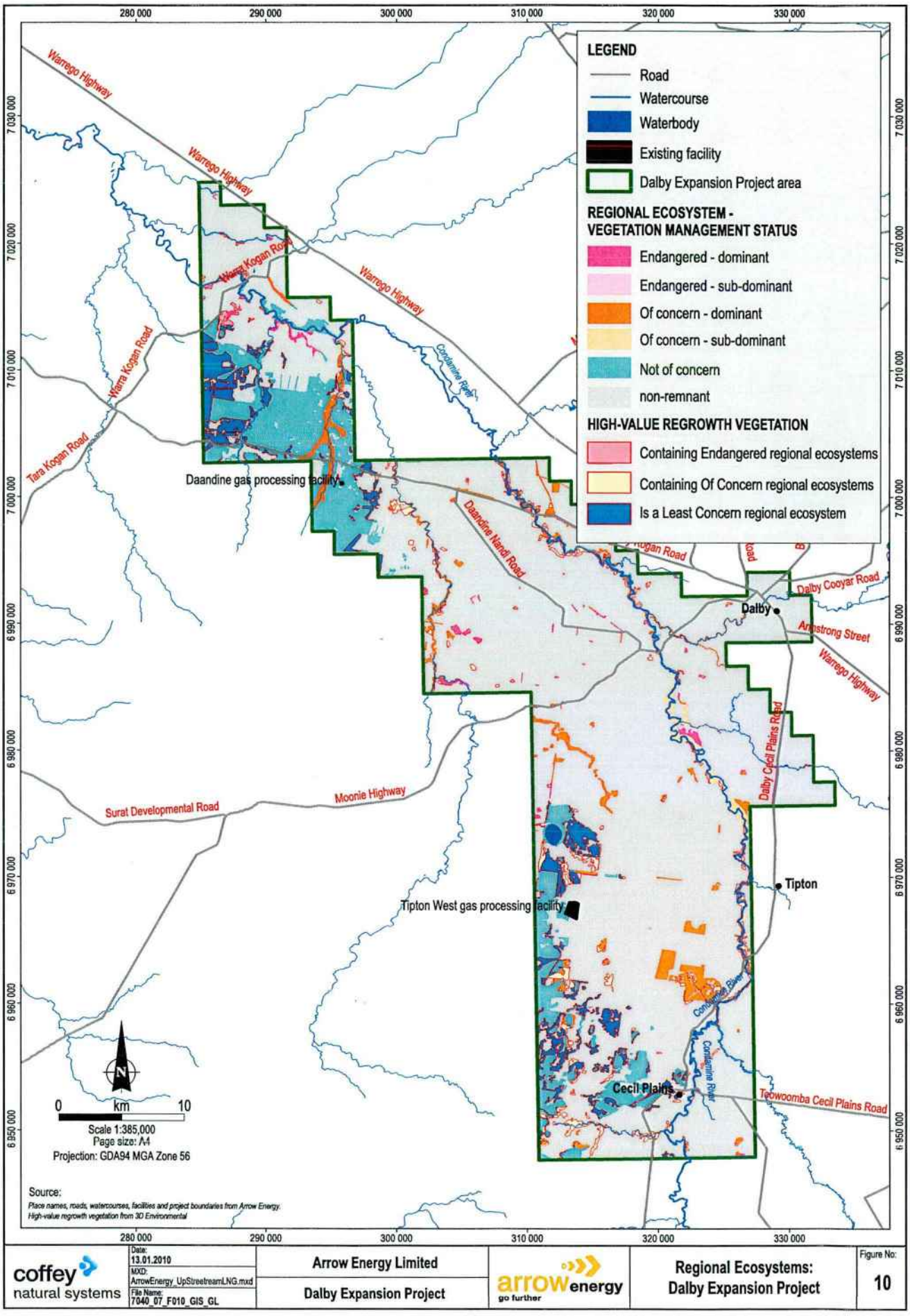
coffey natural systems	Date: 30.11.2009 MXD: ArrowEnergy_UpstreamLNG.mxd File Name: 7040_07_F007_GIS_GL	Arrow Energy Limited Dalby Expansion Project	arrow energy go further	EPBC Act listed ecological communities: Proposed Duntroon facilities	Figure No: 7



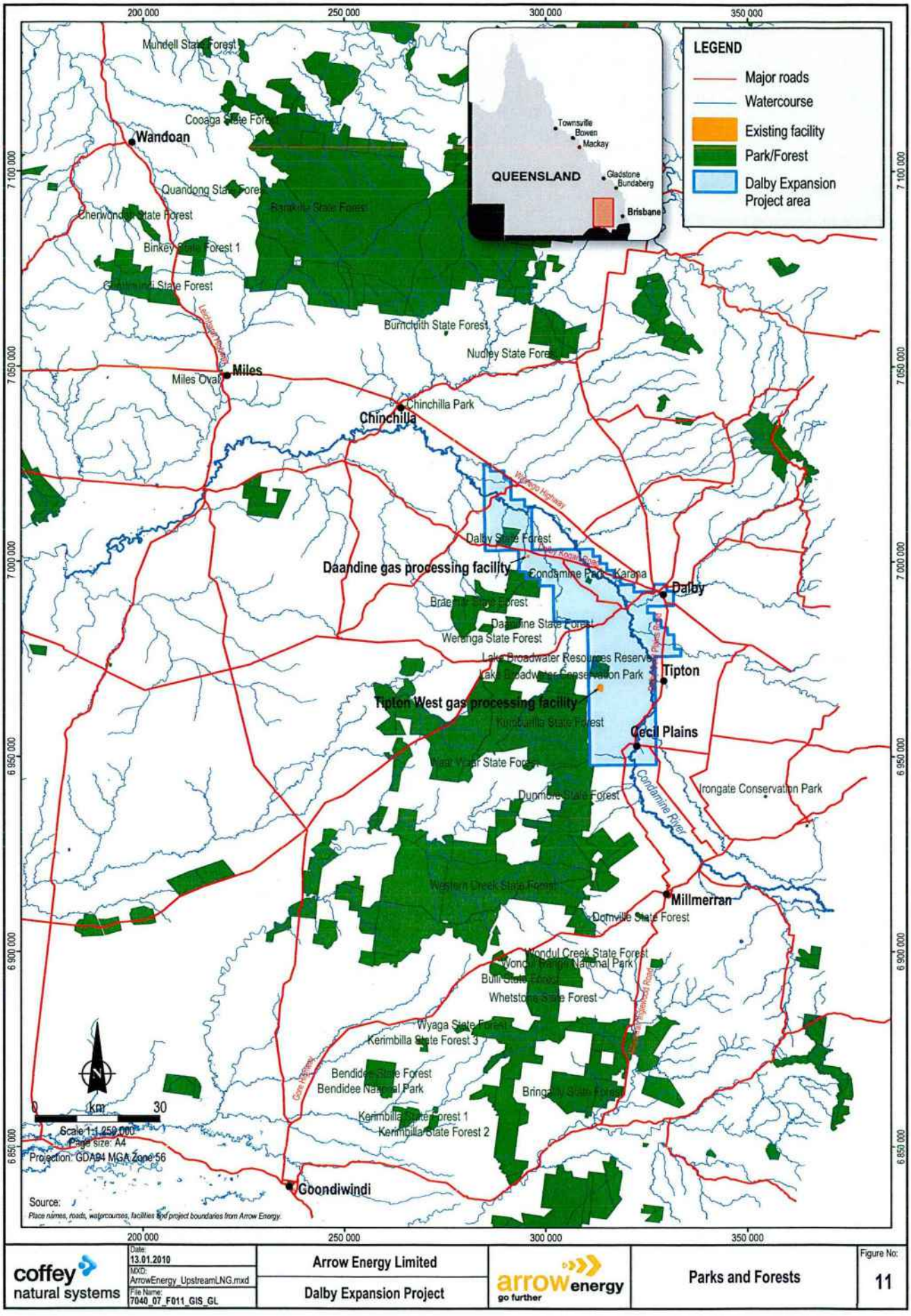
coffey natural systems	Date: 30.11.2009 MXD: ArrowEnergy_UpstreamLNG.mxd File Name: 7040_07_F008_GIS_GL	Arrow Energy Limited Dalby Expansion Project	arrow energy go further	EPBC Act listed ecological communities: Proposed Lynwood North (option) facilities	Figure No: 8



coffey natural systems	Date: 19.01.2010 MXD: ArrowEnergy_UpStreetreamLNG.mxd File Name: 7040_07_F009_GIS_GL	Arrow Energy Limited Dalby Expansion Project	arrow energy go further	EPBC Act Listed ecological communities: proposed connection pipeline and well areas	Figure No: 9



coffey natural systems	Date: 13.01.2010 MXD: ArrowEnergy_UpStreetreamLNG.mxd File Name: 7040_07_F010_GIS_GL	Arrow Energy Limited Dalby Expansion Project	arrow energy go further	Regional Ecosystems: Dalby Expansion Project	Figure No: 10



coffey natural systems	Date: 13.01.2010 MXD: ArrowEnergy_UpstreamLNG.mxd File Name: 7040_07_F011_GIS_GL	Arrow Energy Limited Dalby Expansion Project	arrow energy go further	Parks and Forests	Figure No: 11

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

From: s. 22(1)(a)(ii)
Sent: Wednesday, 20 January 2010 5:14 PM
To: s. 47F(1) @coffey.com'
Cc: s. 22(1)(a)(ii)
Subject: Draft Referrals - Surat Gas Project/ Dalby Expansion Project [SEC=UNCLASSIFIED]

Categories: UNCLASSIFIED

Hi s. 47F(1)

I have reviewed the two draft referrals and there appears to be adequate information to make a determination. However, would you kindly clarify the total area of disturbance for each project, and specifically, how much area (ha) of Brigalow (and/or other EPBC vegetation) will be cleared?

Also, on page 9 of the Dalby Expansion referral please change DEHAW to DEWHA, and on page 12, change EPCB to EPBC Act.

Please note that we are unable to 'pre-empt' the determination at this stage.

Regards,

s. 22(1)(a)(ii) | Assessment Officer
Department of the Environment, Water, Heritage and the Arts | GPO Box 787 CANBERRA, ACT 2601
s. 22(1)(a)(ii) @environment.gov.au

Specify
Clarify total footprint - in ha

p 9 DEWHA

Dalby Expansion project
Clarify project title

p12. EPBC

like to clarify how many ha of Brigalow to be cleared.

Surat
Clarify area of disturbance.

- Area of disturbance

Finger Panic Grass

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

From: s. 22(1)(a)(ii)
Sent: Friday, 15 January 2010 5:08 PM
To: s. 22(1)(a)(ii)
Cc: s. 22(1)(a)(ii) Barker, James
Subject: FW: 7040 Arrow Energy Surat Gas Project - Draft EPBC Act referrals for review and informal comment [SEC=UNCLASSIFIED]
Categories: UNCLASSIFIED
Attachments: oledata.mso; SuratGasProject_EPBC_Referral.pdf; Dalby_Expansion_Project_EPBC_Referral.pdf

Hi s. 22(1)(a)(ii)
See email below from coffey and also James' email - Are you able to have a look at these two referrals and make some comments? Nothing too in depth, they'll be assessed when they come in later. Mostly looking for your thoughts on whether they've given us enough info to make a referral decision.

I think there is a link between these referrals and the Shell LNG referrals you assessed. Not sure, but I think you also attended the meeting with Arrow last year?

I know you're busy, but everyone's a bit pushed at the moment.
If you could send an email to let the company know we received their drafts, have a look and send me your comments, that would be great.

Any problems, I'll talk to you on Monday.

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

Assistant Director
Mining Section
Approvals & Wildlife
Dept of the Environment, Water, Heritage & the Arts
ph s. 22(1)(a)(ii)
Fax s. 22(1)(a)(ii)
Email: lucy.butterfield@environment.gov.au

From: Barker, James
Sent: Friday, 15 January 2010 11:51 AM
To: s. 22(1)(a)(ii)
Cc: s. 22(1)(a)(ii)
Subject: FW: 7040 Arrow Energy Surat Gas Project - Draft EPBC Act referrals for review and informal comment [SEC=UNCLASSIFIED]

Could you plse pass this to whoever discussed it with Coffey late last year? Could whoever looks at it also just shoot a quick acknowledgment of receipt to s. 47F(1) It may be a push for us to comment by next Wednesday (when they've asked for it), but alternatively I'm happy to discuss it with them by phone on Wednesday. If they are worried about pausing their preparatory works because of the referral, and if it is clearly an NCA, they could always not refer it at all of course.
Thanks
j

From: s. 47F(1) @coffey.com]
Sent: Thursday, 14 January 2010 10:11 PM
To: Barker, James
Cc: s. 47F(1) @arrowenergy.com.au); s. 47F(1)
y
Subject: 7040 Arrow Energy Surat Gas Project - Draft EPBC Act referrals for review and informal comment

Dear James,

Thank you for your time today and your agreement for DEWHA to undertake a brief review (and informal comment) of draft EPBC Act referrals prepared by Arrow Energy for its proposed Dalby Expansion and Surat Gas Projects.

As advised, Arrow Energy is a coal seam gas producer with operations in the Surat Basin in South East Queensland. Arrow Energy currently supplies gas to domestic gas markets in eastern Australia. In addition to these markets, Arrow Energy has identified potential export LNG market opportunities and seeks to expand its Surat Basin operations to meet increased domestic demand, and to prove and develop a viable gas supply for LNG production and export.

Arrow Energy currently operates its coal seam gas fields under environmental authorities (petroleum activities) issued under the *Environment Protection Act 1994* (Qld). To address the potential environmental impacts of a significantly expanded operation, Arrow Energy intends to volunteer to prepare an Environmental Impact Statement (EIS) under the *Environment Protection Act 1994* (Qld). The Surat Gas Project defines the scope of the EIS which covers some 8,000 km^2 and extends from Wandoan to Goondiwindi in an arc through Dalby. Given the size of the project area and due to uncertainty about impacts on matters of national environmental significance, Arrow Energy has prepared a draft EPBC Act referral nominating the proposed action a 'controlled action'. As discussed, when formally submitted this will negate development in the project area until the requisite approvals process has been completed and approval (including conditions) advised.

Cessation of development activities would curtail Arrow Energy's ability to continue development to meet current domestic gas supply contracts. The nature of coal seam gas production requires an annual maintenance well program to maintain production levels. Further, preliminary development activities are required to prove a viable gas supply for LNG production, as financial investment decisions need to be taken during the EIS process. Infrastructure (wells and production facilities) required to fulfil these requirements have been identified and are being specifically addressed outside the scope of the EIS. Applications to amend existing environmental authorities have been prepared to enable the activities to proceed. Amendment requires an appropriate level of impact assessment, the results of which indicate the proposed actions are 'not a controlled action', as matter of national environmental significance have been avoided. These activities are covered by the Dalby Expansion Project for which a draft EPBC Act referral has been prepared nominating the proposed action as 'not a controlled action'.

Collectively, the two draft referrals cover coal seam gas field expansion activities proposed by Arrow Energy. Two referrals have been prepared to ensure Arrow Energy's current and planned maintenance activities are not stopped during the voluntary EIS process. Queensland Department of Environment and Resource Management (assessment agency and regulator for environmental authorities) has endorsed the approach proposed by Arrow Energy.

Based on advice from s. 22(1)(a)(ii), Arrow Energy is anxious to ensure its current and planned maintenance activities are not at risk of being stopped by submission of an EPBC Act referral. Arrow Energy recognises that submission of a referral for the much larger Surat Gas Project would negate development proceeding during the assessment process.

With this background information and an understanding of Arrow Energy's desire to avoid a moratorium on its current and planned maintenance activities (Dalby Expansion Project), it would be greatly appreciated if DEWHA would review the enclosed draft referrals and provide informal comment on their adequacy and most importantly, advice on whether the Surat Gas Project referral would invoke a moratorium on activities planned in the Dalby Expansion Project.

Arrow Energy is anxious to formally submit the referrals, as processes (including anticipated statutory timeframes) under the EPBC Act are critical path for financial investment decisions.

It would be greatly appreciated if DEWHA could provide any comments by COB Wednesday 20 January 2010. As noted in this email and in our phone conversation, our greatest concerns are the issues relating to the moratorium on activity and whether the Dalby Expansion Project referral contains adequate information to support a 'not a controlled action' determination.

Enclosed are the two draft referrals and several figures showing the extent of the projects. Full documentation relating to the referrals will be able to be downloaded from our ftp site tomorrow. We will advise the appropriate address and access details tomorrow.

The projects and issues were discussed with s. 22(1)(a)(ii) and his team prior to the Christmas break.

Please do not hesitate to contact me if you have any concerns or queries with this request for Arrow Energy to obtain, and benefit from, informal review of the enclosed referrals.

Regards,

s. 47F(1)

Senior Principal

Coffey Environments
126 Trenerry Crescent Abbotsford VIC 3067 Australia
T s. 47F(1) F s. 47F(1) M s. 47F(1)
coffey.com

50 YEARS
AN EXTRAORDINARY JOURNEY

SURAT GAS PROJECT

EPBC ACT REFERRAL

Arrow Energy

January 2010

arrow energy

coffey natural systems
SPECIALISTS IN PEOPLE AND PLACE

Coffey Natural Systems Pty Ltd ABN 61 005 041 878
Level 21, 12 Creek Street Brisbane QLD 4000 Australia
T (+61) (7) 3002 0400 F (+61) (7) 3002 0444
coffey.com

Project director	s. 47F(1)		
Project manager	s. 47F(1)		
Version:	**Details:**	**Approved:**	**Date:**
7040_v1	Final for exhibition	s. 47F(1)	14 January 2010

Australian Government

Department of the Environment, Water, Heritage and the Arts

Referral of proposed action

What is a referral?

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) provides for the protection of the environment, especially matters of national environmental significance (NES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the matters of NES without approval from the Australian Government Environment Minister or the Minister's delegate. (Further references to 'the Minister' in this form include references to the Minister's delegate.) To obtain approval from the Environment Minister, a proposed action should be referred. The purpose of a referral is to obtain a decision on whether your proposed action will need formal assessment and approval under the EPBC Act.

Your referral will be the principal basis for the Minister's decision as to whether approval is necessary and, if so, the type of assessment that will be undertaken. These decisions are made within 20 business days, provided that sufficient information is provided in the referral.

Who can make a referral?

Referrals may be made by or on behalf of a person proposing to take an action, the Commonwealth or a Commonwealth agency, a state or territory government, or agency, provided that the relevant government or agency has administrative responsibilities relating to the action.

When do I need to make a referral?

A referral must be made for actions that are likely to have a significant impact on the following matters protected by Part 3 of the EPBC Act:

- World Heritage properties (sections 12 and 15A)
- National Heritage places (sections 15B and 15C)
- Wetlands of international importance (sections 16 and 17B)
- Listed threatened species and communities (sections 18 and 18A)
- Listed migratory species (sections 20 and 20A)
- Protection of the environment from nuclear actions (sections 21 and 22A)
- Commonwealth marine environment (sections 23 and 24A)
- The environment, if the action involves Commonwealth land (sections 26 and 27A), including:
    - actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land);
    - actions taken on Commonwealth land that may have a significant impact on the environment generally;
- The environment, if the action is taken by the Commonwealth (section 28)
- Commonwealth Heritage places outside the Australian jurisdiction (sections 27B and 27C)

You may still make a referral if you believe your action is not going to have a significant impact, or if you are unsure. This will provide a greater level of certainty that Commonwealth assessment requirements have been met.

To help you decide whether or not your proposed action requires approval (and therefore, if you should make a referral), the following guidance is available from the Department's web site:

- the Policy Statement titled Significant Impact Guidelines 1.1 – Matters of National Environmental Significance. Additional sectoral guidelines are also available.
- the Policy Statement titled Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies.
- the interactive map tool (enter a location to obtain a report on what matters of NES may occur in that location).

Can I refer part of a larger action?

In certain circumstances, the Minister may not accept a referral for an action that is a component of a larger action and may request the person proposing to take the action to refer the larger action for consideration under the EPBC Act (Section 74A, EPBC Act). If you wish to make a referral for a staged or component referral, read 'Fact Sheet 6 Staged Developments/Split Referrals' and contact the Referral Business Entry Point (1800 803 772).

Do I need a permit?

Some activities may also require a permit under other sections of the EPBC Act. Information is available on the Department's web site.

What information do I need to provide?

Completing all parts of this form will ensure that you submit the required information and will also assist the Department to process your referral efficiently.

You can complete your referral by entering your information into this Word file.

Instructions

Instructions are provided in green text throughout the form.

Attachments/supporting information

The referral form should contain sufficient information to provide an adequate basis for a decision on the likely impacts of the proposed action. You should also provide supporting documentation, such as environmental reports or surveys, as attachments.

Coloured maps, figures or photographs to help explain the project and its location should also be submitted with your referral. Aerial photographs, in particular, can provide a useful perspective and context. Figures should be good quality as they may be scanned and viewed electronically as black and white documents. Maps should be of a scale that clearly shows the location of the proposed action and any environmental aspects of interest.

Please ensure any attachments are below two megabytes (2mb) as they will be published on the Department's website for public comment. To minimise file size, enclose maps and figures as separate files if necessary. If unsure, contact the Referral Business Entry Point for advice. Attachments larger than two megabytes (2mb) may delay processing of your referral.

Note: the Minister may decide not to publish information that the Minister is satisfied is commercial-in-confidence.

How do I submit a referral?

Referrals may be submitted by mail, fax or email.

Mail to:

Referral Business Entry Point
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

- If submitting via mail, electronic copies of documentation (on CD/DVD or by email) are appreciated.

Fax to: 02 6274 1789

- Faxed documents must be of sufficiently clear quality to be scanned into electronic format.
- Address the fax to the mailing address, and clearly mark it as a 'Referral under the EPBC Act'.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

Email to: epbc.referrals@environment.gov.au

- Clearly mark the email as a 'Referral under the EPBC Act'.
- Attach the referral as a Microsoft Word file and, if possible, a PDF file.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

What happens next?

Following receipt of a valid referral (containing all required information) you will be advised of the next steps in the process, and the referral and attachments will be published on the Department's web site for public comment.

The Department will write to you within 20 business days to advise you of the outcome of your referral and whether or not formal assessment and approval under the EPBC Act is required. There are a number of possible decisions regarding your referral:

The proposed action is NOT LIKELY to have a significant impact and does NOT NEED approval

No further consideration is required under the environmental assessment provisions of the EPBC Act and the action can proceed (subject to any other Commonwealth, state or local government requirements).

The proposed action is NOT LIKELY to have a significant impact IF undertaken in a particular manner

The particular manner in which you must carry out the action will be identified as part of the final decision. You must report your compliance with the particular manner to the Department.

The proposed action is LIKELY to have a significant impact and does NEED approval

If the action is likely to have a significant impact a decision will be made that it is a *controlled action*. The particular matters upon which the action may have a significant impact (such as World Heritage values or threatened species) are known as the *controlling provisions*.

The controlled action is subject to a public assessment process before a final decision can be made about whether to approve it. The assessment approach will usually be decided at the same time as the controlled action decision. (Further information about the levels of assessment and basis for deciding the approach are available on the Department's web site.)

The proposed action would have UNACCEPTABLE impacts and CANNOT proceed

The Minister may decide, on the basis of the information in the referral, that a referred action would have clearly unacceptable impacts on a protected matter and cannot proceed.

Compliance audits

If a decision is made to approve a project, the Department may audit it at any time to ensure that it is completed in accordance with the approval decision or the information provided in the referral. If the project changes, such that the likelihood of significant impacts could vary, you should write to the Department to advise of the changes.

For more information

- call the Department of the Environment, Water, Heritage and the Arts Community Information Unit on 1800 803 772 or
- visit the web site www.environment.gov.au/epbc

All the information you need to make a referral, including documents referenced in this form, can be accessed from the above web site.

Referral of proposed action

Project title:

1 Summary of proposed action

NOTE: You must also attach a map/plan(s) showing the location and approximate boundaries of the area in which the project is to occur. Maps in A4 size are preferred. You must also attach a map(s)/plan(s) showing the location and boundaries of the project area in respect to any features identified in 3.1 & 3.2, as well as the extent of any freehold, leasehold or other tenure identified in 3.3(j).

1.1 **Short description**

Use 2 or 3 sentences to uniquely identify the proposed action and its location.

Arrow Energy (Arrow) is seeking to expand its coal seam gas operations in Queensland's Surat Basin to meet increasing domestic demand for gas and to supply gas to proposed export liquefied natural gas (LNG) projects.

The proposed Surat Gas Project involves the development of coal seam gas production infrastructure in an area that extends from Wandoan to Dalby and south towards Millmerran and Goondiwindi. Arrow holds petroleum tenements and environmental approvals for exploration activities in the project area. Arrow's existing gas fields and processing developments at Tipton West, Daandine, Stratheden and Kogan North near Dalby are encompassed within the project area (see Figure 1).

1.2 **Latitude and longitude**

Latitude and longitude details are used to accurately map the boundary of the proposed action. If these coordinates are inaccurate or insufficient it may delay the processing of your referral.

location point	Latitude			Longitude		
	degrees	minutes	seconc	degrees	minutes	seconds
1	27	39	54.34	151	25	3.93
2	27	39	54.34	151	20	3.93
3	27	44	54.34	151	20	3.93
4	27	44	54.34	151	15	3.94
5	28	4	54.33	151	15	3.95
6	28	4	54.33	151	10	3.95
7	28	9	54.33	151	10	3.95
8	28	9	54.32	151	0	3.96
9	28	14	54.32	151	0	3.96
10	28	14	54.32	150	50	3.97
11	28	19	54.33	150	50	3.97
12	28	19	54.33	150	45	3.97
13	28	24	54.32	150	45	3.98
14	28	24	54.32	150	40	3.98
15	28	29	54.33	150	40	3.99
16	28	29	54.33	150	30	4
17	28	4	54.32	150	30	3.98
18	28	4	54.31	150	45	3.96
19	27	59	54.32	150	45	3.96
20	27	59	54.33	151	5	3.96
21	27	59	54.33	151	5	3.96
22	27	29	54.34	151	5	3.92
23	27	29	54.33	150	45	3.94
24	27	24	54.33	150	45	3.93
25	27	24	54.33	150	50	3.92
26	27	19	54.34	150	50	3.92
27	27	19	54.34	150	55	3.91
28	27	24	54.34	150	55	3.91

	29	27	24	54.34	151	5	3.91
	30	27	14	54.34	151	5	3.9
	31	27	14	54.34	151	0	3.9
	32	27	9	54.35	151	0	3.9
	33	27	9	54.34	150	58	3.9
	34	27	8	54.34	150	58	3.9
	35	27	8	54.34	150	56	3.9
	36	27	7	54.34	150	56	3.9
	37	27	7	54.34	150	55	3.9
	38	27	4	54.35	150	55	3.91
	39	27	4	54.35	150	50	3.91
	40	26	59	54.34	150	50	3.92
	41	26	59	54.29	150	50	3.92
	42	26	59	54.29	150	50	3.65
	43	26	59	54.3	150	35	3.67
	44	26	44	54.35	150	35	3.66
	45	26	44	54.35	150	30	3.94
	46	26	39	54.35	150	30	3.94
	47	26	39	54.31	150	30	3.66
	48	26	39	54.31	150	25	3.67
	49	26	44	54.3	150	25	3.67
	50	26	44	54.31	150	22	33.67
	51	26	44	54.31	150	20	3.67
	52	26	39	54.35	150	20	3.67
	53	26	39	54.35	150	15	3.95
	54	26	34	54.35	150	15	3.95
	55	26	34	54.35	150	10	3.95
	56	26	29	54.35	150	10	3.95
	57	26	29	54.36	150	5	3.95
	58	26	19	54.36	150	5	3.94
	59	26	19	54.36	150	0	3.94
	60	26	15	54.36	150	0	3.94
	61	26	15	54.36	149	58	3.94
	62	26	13	54.36	149	58	3.94
	63	26	13	54.36	149	57	3.94
	64	26	11	54.36	149	57	3.93
	65	26	11	54.36	149	56	3.93
	66	26	9	54.36	149	56	3.93
	67	26	9	54.36	150	0	3.93
	68	25	59	54.36	150	0	3.92
	69	25	59	54.36	150	2	3.92
	70	26	2	54.36	150	2	3.92
	71	26	2	54.36	150	3	3.92
	72	26	7	54.36	150	3	3.93
	73	26	7	54.36	150	4	3.93
	74	26	9	54.36	150	4	3.93
	75	26	9	54.36	150	5	3.93
	76	26	14	54.36	150	5	3.93
	77	26	14	54.35	150	8	39.95
	78	26	13	11.99	150	9	45.26
	79	26	12	50.3	150	9	42.03
	80	26	12	41.9	150	10	4.84
	81	26	12	45.48	150	10	33.74
	82	26	12	59.98	150	10	53.07
	83	26	13	14.4	150	10	57.75
	84	26	13	17.13	150	11	2.44
	85	26	13	46.72	150	11	53.29
	86	26	13	47.3	150	11	54.27
	87	26	13	53.5	150	12	4.74
	88	26	14	11.52	150	12	22.35

89	26	15	19.71	150	13	29
90	26	15	35.11	150	13	48.8
91	26	15	36.41	150	13	50.46
92	26	16	38.64	150	15	10.44
93	26	19	2.14	150	14	47.64
94	26	19	3.11	150	14	47.61
95	26	19	4.63	150	15	45.83
96	26	19	6.18	150	16	45.99
97	26	19	6.46	150	16	56.87
98	26	19	54.34	150	17	2.32
99	26	20	38.31	150	16	45.67
100	26	20	38.46	150	16	46.74
101	26	20	47	150	17	42.96
102	26	21	3.52	150	19	32.71
103	26	21	24.21	150	19	50.67
104	26	21	31.76	150	19	57.83
105	26	21	43.15	150	20	7.96
106	26	21	45.86	150	20	9.77
107	26	21	47.95	150	20	12.56
108	26	21	51.01	150	20	15.17
109	26	21	56.66	150	20	17.51
110	26	22	3.07	150	20	23.48
111	26	22	7.43	150	20	29.07
112	26	22	11.37	150	20	34.11
113	26	22	13.06	150	20	38.73
114	26	22	14.65	150	20	40.66
115	26	22	16.53	150	20	44.08
116	26	22	28.23	150	20	50.12
117	26	22	31.04	150	20	53.23
118	26	22	34.21	150	20	55.91
119	26	22	38.28	150	20	56.8
120	26	22	48.33	150	20	56.52
121	26	22	51.89	150	20	58.73
122	26	22	54.32	150	20	59.48
123	26	22	59.66	150	21	3.12
124	26	23	4.66	150	21	5.81
125	26	23	12.11	150	21	5.04
126	26	23	17.33	150	21	7.25
127	26	23	23.33	150	21	13.56
128	26	23	23.65	150	21	15.74
129	26	23	24.91	150	21	18.98
130	26	23	27.52	150	21	23.9
131	26	23	29.54	150	21	26.92
132	26	23	32.37	150	21	30.67
133	26	23	34.63	150	21	32.81
134	26	23	38.97	150	21	40.47
135	26	23	42.74	150	21	46.14
136	26	23	46.99	150	21	49.16
137	26	23	51.91	150	21	52.05
138	26	23	53.3	150	21	53.49
139	26	23	56.79	150	21	54.54
140	26	23	59.29	150	21	57.54
141	26	23	56.34	150	21	56.65
142	26	24	1.07	150	22	1.57
143	26	24	4.03	150	22	3.32
144	26	24	5.99	150	22	6.61
145	26	24	6.8	150	22	7.64
146	26	24	48.19	150	22	1.14
147	26	25	0.8	150	23	40.95
148	26	25	1.17	150	23	43.95

149	26	25	31.91	150	27	52.51
150	26	25	38.97	150	28	49.79
151	26	25	39.67	150	28	49.9
152	26	26	9.05	150	28	59.76
153	26	26	48.21	150	29	29.75
154	26	27	19.76	150	29	45.27
155	26	28	25.1	150	29	35.34
156	26	28	29.85	150	30	13.51
157	26	28	51.35	150	30	22.18
158	26	29	15.38	150	30	11.89
159	26	31	3.28	150	30	9.66
160	26	31	4.25	150	30	9.5
161	26	31	17.58	150	32	8.58
162	26	31	17.77	150	32	10.09
163	26	31	26.06	150	33	2.03
164	26	33	50.38	150	34	7.66
165	26	33	18.27	150	35	38.12
166	26	34	41.27	150	35	32.63
167	26	34	54.3	150	35	17.42
168	26	34	54.3	150	40	3.65
169	26	39	54.3	150	40	3.65
170	26	39	54.3	150	45	3.65
171	26	44	54.3	150	45	3.65
172	26	44	54.29	150	55	3.64
173	26	49	54.29	150	55	3.64
174	26	49	54.29	151	0	3.64
175	26	54	54.29	151	0	3.64
176	26	54	54.28	151	10	3.63
177	27	9	54.34	151	10	3.9
178	27	9	54.34	151	17	3.9
179	27	10	54.34	151	17	3.9
180	27	10	54.34	151	18	3.9
181	27	12	54.34	151	18	3.9
182	27	12	54.34	151	15	3.9
183	27	14	54.34	151	15	3.9
184	27	14	54.34	151	20	3.9
185	27	29	54.34	151	20	3.92
186	27	29	54.34	151	25	3.92

The Interactive Mapping Tool may provide assistance in determining the coordinates for your project area.

If area less than 5 hectares, provide the location as a single pair of latitude and longitude references. If area greater than 5 hectares, provide bounding location points.

If the proposed action is linear (eg. a road or pipeline), provide coordinates for each turning point.

Do not use AMG coordinates.

1.3 **Locality**

Provide a brief physical description of the project location (eg. proximity to major towns, or for off-shore projects, shortest distance to mainland).

The proposed action is located approximately 200 km west of Brisbane, Queensland.

Figure 1 shows the location of the project, with reference to major towns.

1.4 **Size of the development footprint or work area (hectares)**

A number of Authorities to Prospect (ATPs) and Petroleum Leases (PLs) form the project area relating to the proposed action (see Figure 1).

The project area comprises a total of approximately 8,000 km^2. The actual area of disturbance will be much less than this, and pertain only to areas where wells or other infrastructure is proposed. The general disturbance footprint associated with each project component is described below.

Exploration activities
The area required to drill exploration and pilot wells is approximately 60 m by 70 m for each well site. Construction of small water holding dams is also required to store associated water produced during pilot testing activities (up to 5 ha).

Production wells
The approximate area required for development of production wells is initially 60 m by 70 m for each new site. Following drilling and well establishment activities, each well site is rehabilitated leaving a production area of approximately 10 m by 10 m for well operation. Wherever possible, wells will be typically set out in a grid spacing of between 700 m and 1,200 m.

Gathering pipelines and access tracks
A right of way of up to 30 m (typically 18 to 24 m) width is required to install the gas and water gathering pipelines. Permanent access tracks, approximately 3 m wide, are maintained to each well site and will be typically located adjacent to the gas and water gathering lines. Existing tracks will be used where possible. The balance of the construction right of way is rehabilitated.

Integrated Production Facilities (IPF) Development

The approximate area required for each new integrated production facility is 750 m by 350 m. This area will incorporate the central gas processing, power generation and water treatment facilities. In addition, a further approximate 100 ha is required for dams to store associated water including feed water, treated water, oily water and brine concentrate.

High Pressure Gas Pipelines

The approximate width of right of ways for high pressure gas pipelines is 30 m. These will be used to connect new IPFs to sales gas delivery infrastructure.

1.5 **Street address of the site**

Arrow's Dalby site office address is:

Arrow Energy Ltd
37 Bennie Street
Dalby Queensland 4405

1.6 **Lot description**
Describe the lot numbers and title description, if known.

Due to the nature of the project and the large area covered by petroleum tenements, numerous lots will be affected by the development. A detailed list of affected lots can be provided on request.

A plan showing the proposed EIS area in relation to Arrow's current petroleum tenements is attached as Figure 1.

1.7 **Local Government Area and Council contact (if known)**

If the project is subject to local government planning approval, provide the name of the relevant council contact officer.

The proposed Surat Gas Project area is located within the Western Downs Regional Council in the northwest and Toowoomba Regional Council to the southeast.

1.8 **Timeframe**

Specify the timeframe in which the action will be taken including the estimated start date of construction/operation.

Field development and associated infrastructure is anticipated to commence in early 2011. Production wells are likely to be drilled at the rate of 10 to 15 wells per month. Each integrated production facility is expected to take 12 to 18 months to construct, with commissioning of initial facility installations likely to commence in late 2012. This is subject to obtaining the necessary State and Commonwealth Government approvals. The anticipated production life for the gas wells is in excess of 20 years.

1.9	**Alternatives** Does the proposed action include alternative timeframes, locations or activities?	X	No
			Yes, you must also complete section 2.2
1.10	**State assessment** Is the action subject to a state or territory environmental impact assessment?		No
		X	Yes, you must also complete Section 2.4
1.11	**Component of larger action** Is the proposed action a component of a larger action?	X	No
			Yes, you must also complete Section 2.6
1.12	**Related actions/proposals** Is the proposed action related to other actions or proposals in the region (if known)?		No
		X	Yes, provide details: The Surat Gas Project will enable Arrow to progress development of coal seam gas reserves in the Surat Basin. Current developments and those proposed in the Dalby Expansion Project provide a template for future development. The Dalby Expansion Project, for which a separate referral has been prepared and will be lodged concurrently with this referral, will involve the development of up to 300 new production wells and two integrated production facilities that include gas compression, water treatment and power generation infrastructure. The project satisfies Arrow's need to meet its contractual obligations under current domestic gas supply agreements, as well as proving that a viable gas supply exists for proposed export LNG developments adjacent to Gladstone. Arrow has approvals for existing developments in the Surat Basin and has made an application to amend (and consolidate) existing environmental authorities (petroleum activities) for activities and infrastructure proposed as part of the Dalby Expansion Project. The amendment application will be assessed by the Queensland Department of Environment and Resource Management (DERM) under relevant provisions of the Environment Protection Act. The Surat Gas Project will enable Arrow to commercialise its coal seam gas resources through access to domestic and export markets. Access to domestic

			markets is currently provided by connection to existing gas transmission networks. Access to export markets will be facilitated through three related projects. They are: • Surat to Gladstone Pipeline – this proposed high pressure gas pipeline will transport gas from near Kogan North in the Surat Basin to Gladstone on the Queensland coast. To be constructed and operated by Surat Gladstone Pipeline Pty Ltd, a wholly owned subsidiary of Arrow, it will supply proposed LNG developments adjacent to Gladstone. An Environmental Impact Statement (EIS) under the Environment Protection Act has been prepared for the proposed pipeline. An EPBC Act referral (2009/5029) has been submitted for the project which was declared a controlled action on 15 October 2009. Assessment on preliminary information was nominated as the appropriate level of assessment for potential significant impacts on listed threatened species and communities (Sections 18 and 18A). • Gladstone LNG Project – Arrow in conjunction with LNG Ltd proposes the development of an initial 1.5 Mtpa LNG plant on Fisherman's Landing north of Gladstone. The proposed plant is expected to take feed gas supply from the proposed Surat to Gladstone Pipeline. An EIS under the Environment Protection Act has been prepared for the proposed facility. The proposed action was referred (2008/3954) and it was determined that is was not a controlled action on 1 February 2008. • Shell Australia LNG Project – Shell CSG (Australia) Pty Ltd (Shell) proposes the development of an up to 16 Mtpa LNG facility on Curtis Island off Gladstone, Queensland. The proposed plant is expected to take feed gas supply from the proposed Surat to Gladstone Pipeline. Shell is preparing an EIS under the *State Development and Public Works Organisation Act 1970* (Qld) for the project. Two EPBC Act referrals have been lodged for this project, one for the proposed feed gas pipeline, a short section of pipeline from near the Gladstone City Gate to the LNG plant (2009/5008) and a second for the LNG facility including plant and marine loading facility (2009/5007). The proposed development has been declared a controlled action and the Queensland EIS process accredited as the appropriate level of assessment.
1.13	**Australian Government funding** Has the person proposing to take the action received any Australian Government grant funding to undertake this project?	X	No
			Yes, provide details:

2 Detailed description of proposed action

NOTE: It is important that the description is complete and includes all components and activities associated with the action. If certain related components are not intended to be included within the scope of the referral, this should be clearly explained in section 2.6.

2.1 Description of proposed action

This should be a detailed description outlining all activities and aspects of the proposed action and should reference figures and/or attachments, as appropriate.

Arrow is seeking to expand its coal seam gas operations in Queensland's Surat Basin to meet increasing domestic demand for gas and to supply gas to proposed export LNG projects.

The proposed Surat Gas Project involves the development of coal seam gas production infrastructure in an area that extends from Wandoan to Dalby and south towards Millmerran and Goondiwindi. Arrow holds petroleum tenements and environmental approvals for exploration activities in the project area. Arrow's existing developments at Tipton West, Daandine and Kogan North near Dalby are encompassed within the project area (see Figure 1). Figure 2 shows the key features within the project area, including the location of State Forests and National Parks.

Development of coal seam gas resources in the Surat Gas Project area will be based on the template provided by existing developments and the infrastructure proposed in the Dalby Expansion Project. Five notional resource areas have been identified and they will be progressively developed in response to market conditions. Each resource area will encompass the infrastructure detailed in Table 1.

Table 1 Typical Surat Gas Project Development Area Infrastructure

Field Development
Approximately 1,500 production wells, associated well infrastructure and gathering systems. Gathering systems including gas and water gathering lines, communication cables and access tracks. Overhead and underground power lines may be required to supply electricity to power pumps and gas separators at well sites (where not generated at the well site).
Integrated Production Facilities
Up to four Integrated Production Facilities (IPF) will be required in each resource area, as well as nodal compression facilities if production wells are located more than approximately 20 km from an IPF. IPF include gas compressors (modular units), water treatment plants and power generating plant. Water treatment facilities include reverse osmosis plants and associated feed water, treated water, brine concentrate holding and oily water dams. Water pipelines may be required to transfer water between IPFs. Gas-engine power generating units will supply electricity required to operate the gas compressors (if electric drives are used) and the water treatment facilities.
High Pressure Gas Pipeline Infrastructure
High pressure gas pipelines will connect IPFs and IPFs to existing sales gas delivery infrastructure (gas transmission network) including domestic and export pipelines.

FIELD DEVELOPMENT

Production wells and associated infrastructure

Arrow proposes to install up to approximately 1,500 production wells, associated well infrastructure and gathering systems in each resource area. Development will also include gathering systems including gas and water gathering lines, communication cables and access tracks. Overhead power lines may be used to supply electricity to power pumps and gas separators at well sites.

Where possible, wells will typically be set out in a grid spacing of between 700 m and 1,200 m. To ensure safe operation of the drilling rig and associated equipment, the well drilling sites normally involve an area of approximately 60 m by 70 m. This is sufficiently large enough for a truck mounted drilling rig, with space around the rig for work related access and materials handling. Prior to drilling a well, a temporary site is prepared. Preparation generally involves:

- Vegetation clearance or trimming.
- Levelling of a drill pad if necessary.
- Excavation and construction of temporary pits to hold drilling fluids and water produced during drilling.

- Excavation of a pit for a ground flare.

Once wells are installed, the well site footprint is reduced to approximately 10 m by 10 m. The site is fenced to enclose the wellhead and other infrastructure (wellhead gas/water separator, control valve, monitoring, metering and communications equipment). The fenced well sites prevent stock and public access to the wellhead. The larger drilling site footprint is then rehabilitated to a land use consistent with surrounding area, or to a standard agreed with the landholder. Farming and grazing activities can continue as normal around established well sites.

If the land use is native vegetation, then site rehabilitation will utilise suitable native tree and grass species (where possible the species will be specific to the original ecosystem). Natural re-seeding of native species is likely to occur if there has been stock piling of removed topsoil, which is reused in rehabilitation. Native vegetative waste will also be spread over disturbed areas to provide a natural source of seed and additional fauna refuge. Use of native grass (or native alternative) species will be undertaken when rapid vegetative cover is required to prevent soil loss.

There will be low-pressure gathering lines to take gas from the wells to the IPFs for compression. Water gathering lines will also be required to transfer associated water from production wells to water treatment facilities (see explanation below).

New water and gas gathering lines will be constructed of small diameter high-density polyethylene (HDPE) pipe. Gathering lines will be buried at a minimum depth of 750 mm. The location of gathering lines and utility trenches will be agreed with landholders to minimise disruption to agricultural activities and to minimise the potential for damage to the gathering lines from agricultural machinery. Locating infrastructure within or adjacent to existing farm tracks and cultivation lines is generally favourable.

The proposed location of production wells within the project area is currently unknown. Well location will be influenced throughout the project's life by:

- Exploratory drilling and pilot well programs successfully identifying viable gas reserves.
- Environmental constraints and location of sensitive receptors.
- Economic and commercial risks influencing the extent and rate of field development.
- Negotiations with landholders over land access and placement of infrastructure.
- The need to refine development plans as new reservoir data is collected and assessed.

INTEGRATED PRODUCTION FACILITIES

Gas Compression and Processing Facilities

Compression facilities receive gas from the gathering lines, and compress and dewater the gas, prior to directing it to sales gas pipelines. Arrow proposes to construct IPFs on their Petroleum Leases (current and proposed). The IPFs will be constructed in a similar manner to the existing Arrow facilities at Tipton West, Daandine, and Kogan on PLs 198, 230 and 230 respectively.

Each facility will include a control room to monitor field development. There will also be service buildings, offices and a flare system. Communication between facilities will be via fibre optic link.

Arrow proposes to co-locate gas compression and processing, water treatment and power generation facilities wherever possible. The proposed IPF sites have not yet been selected. They will however be selected on the grounds of:

- Environmental constraints and location of sensitive receptors.
- Proximity to sales gas transportation infrastructure and production wells.
- Economic and commercial risks influencing the extent and rate of field development.
- Negotiations with landholders over land access and placement of infrastructure.

The EIS process will involve detailed environmental constraints identification and mapping process to ensure that facility sites have minimal impact on sensitive ecological environments.

Water Treatment Facilities and Disposal

The production of groundwater from coal seams, usually with high saline content, is an unavoidable part of the coal seam gas production process. Wells must be dewatered to enable gas flow. This water, known as "associated water", must often be treated to a suitable quality prior to use or discharge to the existing environment.

Water treatment facilities will be required for the expanded field development. These facilities will involve:

- Associated feed (raw) water dam.
- Filtration and reverse osmosis treatment facilities.
- Treated water dam.
- Brine concentrate holding dam.
- Oily water dam.

The number of water treatment facilities and their location is unknown at this stage. There may also be a need for water transfer stations or feed ponds between fields to collect and deliver associated water from the wells to the water treatment facilities. The number of water treatment facilities will ultimately be determined by the number of production wells, and forecasts of water production from these wells.

Potential beneficial uses for treated water are being actively investigated by Arrow. The current base case water management strategy is to use the treated water for irrigation within the vicinity of proposed operations. Potential delivery points target existing irrigation infrastructure, however it is possible that additional infrastructure will be constructed to manage the increased supply of water for irrigation.

Arrow is actively investigating other beneficial use options and is currently working in conjunction with other Surat Basin coal seam gas producers, in considering a long-term aggregated solutions for water treatment, treated water distribution and brine disposal.

Power Generation and Supply

Arrow proposes to construct gas-engine power stations at each IPF. Power from the stations will be used within the facility footprint area to meet the power requirements for gas compression and water treatment. Power will also be distributed to the adjacent gas field via a combination of overhead and underground cabling located within service corridors.

Power station sizing will be determined by the overall power requirements for gas compression, water treatment and wells associated with the facility. Although final locations, sizing, and the number of power generating facilities is currently unknown, each plant will be nominally up to 39 MW.

Gas from the field gathering system will be fed directly to the gas-engine electricity generators. Facilities will be put in place at the inlet of the power generation plant to control any free water and / or particulates, which may be present in the gathering pipes.

Final Decommissioning and Rehabilitation

Wells will be decommissioned when they reach the end of their useful life. All surface equipment will be removed, the well casing will be cut off below the ground surface and the well hole plugged with concrete. The well site fence will be removed and the site rehabilitated to a land use consistent with the local area, or as agreed with the landholder. Rehabilitation may involve resurfacing ground levels, regrading surface topsoils, ensuring erosion controls are in place, and re-establishing drainage lines and pasture species (or alternative arrangements agreed with the landholder).

All other infrastructure will be removed from the site (gas compression and processing, water treatment facilities, power generation and supply) and the land rehabilitated to its former land use (where possible). Water dams and access tracks may be useful for landholder. An agreement will be in place if infrastructure is to remain for landholder purposes.

High pressure gas pipelines will be decommissioned in accordance with the requirements of Australian Standard 2885 and any additional requirements contained in environmental authorities.

2.2 Alternative locations, time frames or activities that form part of the referred action

If you have identified that the proposed action includes alternative timeframes, locations or activities (in section 1.9) you must complete this section. Describe any alternatives related to the physical location of the action, time-frames within which the action is to be taken and alternative methods or activities for undertaking the action. Please note, if the action that you propose to take is determined to be a controlled action, any alternative locations, timeframes or activities that are identified here may be subject to environmental assessment and a decision on whether to approve the alternative.

Facility sites and well site locations will be selected with consideration environmental conditions and ease of construction and operation. Environmental constraints mapping will be conducted as part of the EIS assessment process to ensure that the environmental values are clearly identified and known within the project area. A series of fieldwork investigations will also be undertaken to validate desktop site and route selection.

2.3 Context, planning framework and state/local government requirements

Explain the context in which the action is proposed, including any relevant planning framework at the state and/or local government level (eg. within scope of a management plan, planning initiative or policy framework). Describe any Commonwealth or state legislation or policies under which approvals are required or will be considered against.

Arrow is currently preparing an EIS for the project under the Environment Protection Act for the Surat Gas Project. Consideration will be given to the planning framework, and state and local government requirements.

2.4 Environmental impact assessments under Commonwealth, state or territory legislation

If you have identified that the proposed action will be or has been subject to a state or territory environmental impact statement (in section 1.10) you must complete this section. Describe any environmental assessment of the relevant impacts of the project that has been, is being, or will be carried out under state or territory legislation. Specify the type and nature of the assessment, the relevant legislation and the current status of any assessments or approvals. Where possible, provide contact details for the state/territory assessment contact officer.

Describe or summarise any public consultation undertaken, or to be undertaken, during the assessment. Attach copies of relevant assessment documentation and outcomes of public consultations (if available).

Arrow holds or has applied for the petroleum tenements associated with the Surat Gas Project under the *Petroleum and Gas (Production and Safety) Act 2004* (Qld).

To enable production activities on these petroleum tenements to begin, Arrow must also hold environmental authority(s) for level 1 petroleum activities under the Environmental Protection Act. Alternatively, if an environmental authority for the petroleum tenure is already held, review and amendment of the environmental authority is required to incorporate expanded activities.

The environmental authority is the primary statutory document used by the Department of Environment and Resource Management (DERM) in its regulatory role to assess environmental compliance of the project.

To obtain or amend an environmental authority for a level 1 petroleum activity, an EIS may or may not be required. Arrow has elected to prepare a voluntary EIS under Chapter 3 of the Environmental Protection Act. As part of the approvals process, an Environmental Management Plan (EM Plan) must also be submitted to DERM for assessment.

2.5 Consultation with Indigenous stakeholders

Where Indigenous stakeholders are likely to be affected by your proposed action, your referral should describe any consultations undertaken with Indigenous stakeholders. Identify the relevant stakeholders and the status of consultations at the time of the referral.

Cultural Heritage

Arrow is currently finalising a review of its records to better understand the nature and scope of cultural heritage surveys that have occurred to date over its existing tenements. This work should be completed in the near future.

Arrow anticipates commencing the process for development of a Cultural Heritage Management Plan as required to comply with the *Aboriginal Cultural Heritage Act* in the first quarter of 2010. This plan will involve

extensive consultation with Aboriginal Parties and contain management and mitigation measures for Indigenous cultural heritage during exploration, construction and operation phases of the project.

Native Title

Arrow has completed a review of its tenements to determine its immediate development priority. It is intended that Future Act processes, as outlined in the *Native Title Act 1993* (Cwlth) will be followed to obtain the necessary approvals for Future Acts that may have an impact on native title rights and interests.

Arrow will seek to utilise both the voluntary and statutory processes outlined in the legislation and intends to commence the process in the first quarter of 2010, which will involve extensive consultation with Native Title parties.

2.6 A staged development or component of a larger project

If you have identified that the proposed action is a component of a larger action (in section 1.11) you must complete this section. Provide information about the larger action and details of any interdependency between the stages/components and the larger action. You may also provide justification as to why you believe it is reasonable for the referred action to be considered separately from the larger proposal (eg. the referred action is 'stand-alone' and viable in its own right, there are separate responsibilities for component actions or approvals have been split in a similar way at the state or local government levels).

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest.

Your assessment of likely impacts should refer to the following resources (available from the Department's web site):

- specific values of individual World Heritage properties and National Heritage places and the ecological character of Ramsar wetlands;
- profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;
- *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*; and
- associated sectoral and species policy statements available on the web site, as relevant.

Note that even if your proposal will not be taken in a World Heritage area, Ramsar wetland, Commonwealth marine area, or on Commonwealth land, it could still impact upon these areas (for example, through downstream impacts). Consideration of likely impacts should include both direct and indirect impacts.

The approach to locating integrated production facilities and field development will follow environmental procedures developed to minimise impacts on significant environmental values (both State and Commonwealth). As there are existing operations within the project area, the procedures currently used will be implemented for siting new infrastructure. EPBC Act matters of national environmental significance have high environmental value and therefore stringent criteria for field development will be in place to avoid or minimise impacts on these values.

3.1 (a) World Heritage Properties

Description

None present.

Nature and extent of likely impact

Address any impacts on the World Heritage values of any World Heritage property.

3.1 (b) National Heritage Places

Description

None present.

Nature and extent of likely impact

Address any impacts on the National Heritage values of any National Heritage place.

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

The Surat Gas Project will be undertaken within the same catchment as the Narran Lake Nature Reserve, RAMSAR site. This site is located in the north west of NSW and is a significant site for water bird breeding (DEWHA 1999).

The reserve covers part of a large terminal wetland of the Narran River at the end of the Condamine River (which flows from Queensland). The site is downstream of the project area and over 600 km to the southwest.

The project also lies within the same catchment as the Shoalwater and Corio Bays Area RAMSAR site. The southern boundary of the site is approximately 50 km north of Rockhampton, which is over 350 km north-northeast of the Surat Gas Project area.

The Shoalwater and Corio Bays Area comprises terrestrial as well as five major estuarine and marine environments, which represent the largest area in central east Queensland containing representative coastal, subcoastal, aquatic landscapes and ecosystems. The area provides relatively undisturbed habitat for significant floral and faunal assemblages, including populations of rare and threatened species (DEWHA 1995).

Nature and extent of likely impact

Address any impacts on the ecological character of any Ramsar wetlands.

There is a low likelihood of significant impacts on the RAMSAR sites due to their distance from the project area.

3.1 (d) Listed threatened species and ecological communities

Description

The EPBC Protected Matters search undertaken on 29 October 2009 identified 46 threatened species and 5 ecological communities as being potentially present within 5 km of the project area (Appendix 1). Threatened species included 8 birds, 4 mammals, 1 fish, 6 reptiles and 27 plants.

This list is based on the likelihood of occurrence according to distribution of species and their habitats from various government databases. To further assess if any additional EPBC Act listed species could potentially be present within the project area, both flora and fauna database searches were also undertaken.

For flora, the databases included DERM's Regional Ecosystem digital data, the Queensland Herbarium's HerbRecs database (extract August, 2009), DERM's WildNet database (which incorporates HerbRecs specimen data, CORVEG site data and may also include information from research and monitoring programs, inventory programs including extension activities, literature records, wildlife permit returns and community programs). Two flora species, *Bothriochloa biloba* (lobed blue grass) and *Acacia wardellii* were identified through the DERM WildNet database and the Queensland Herbarium database as being recorded in the surrounding area. These species did not register in the EPBC Protected Matters Search. These species have been included in the assessment (resulting in a total of 29 plants). Figure 3 shows the Regional Ecosystems over the project area and Figure 4 the mapped EPBC Act significant ecological communities.

For fauna, the information sources included Birds Australia Atlas database, DERM's WildNet database and specimen records held by the Queensland museum.

Field surveys of the project area are currently being undertaken (November 2009). The surveys targeted locating significant species and species habitat. Surveys also aimed to verify database and DERM's Regional Ecosystem mapping. The results of the surveys were unavailable at the time of preparing this referral. However, results from field survey of the existing operations and for the Dalby Expansion Project have also been used to verify the likelihood of species occurring within the Surat Gas Project area.

Table 2 shows the details of the EPBC Protected Matters search.

Table 2Listed threatened species and ecological communities from EPBC Protected Matters Search and the likelihood of occurrence.

	Species	Status	Type of presence	Likelihood of occurrence
Ecological communities	Brigalow (*Acacia harpophylla* dominant and codominant)	Endangered	Community known to occur within area	***Present:*** This community has been identified within in the project area. The community encompasses RE's 11.9.5, 11.4.3 and 11.3.1 as well as a number of advanced regrowth brigalow communities.
	Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	Critically Endangered	Community likely to occur within area	***Present:*** This community is present in the project area. It encompasses RE's 11.3.21, 11.3.24.

	Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar bioregions.	Endangered	Community likely to occur within area	***Possible:*** This community could be present in the project area.
	Weeping myall woodlands	Endangered	Community likely to occur within area	***Possible:*** This community could be present in the project area.
	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area	***Present:*** This community is present in the southern portion of the project area. The community comprises of RE's 11.8.2a, 11.8.8.
Birds	*Anthochaera phrygia* Regent honeyeater	Endangered	Species or species habitat may occur within area	***Possible:*** The habitat for this species consists of dry eucalypt woodland and open forest, woodland, rural and urban areas with mature eucalypts; favours box-ironbark associations. This species could be present in the project area.
	Erthrottriorchis radiatus Red goshawk	Vulnerable	Species or species habitat likely to occur within area	***Unlikely:*** There is one historical record of the species from Lake Broadwater, however this is expected to be of a transient individual, not permanent populations.
	Geophap sscripta scripta Squatter pigeon (southern)	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** This species could be present in the project area.
	Lathamus discolor Swift parrot	Endangered	Species or species habitat may occur within area	***Unlikely:*** No recent (1980+) records of this species found within the project area.
	Neochmia ruficauda ruficauda Star finch (eastern), star finch (southern)	Endangered	Species or species habitat likely to occur within area	***Unlikely:*** No confirmed records of this species within the project area.
	Polytelis swainsonii Superb Parrot	Vulnerable	Species or species habitat may occur within area	***Unlikely:*** Records from the early 1900's are doubtful. No recent records in the project area.
	Rostratula australis	Vulnerable	Species or species	***Likely***: The habitat

	Australian painted snipe		habitat may occur within area	within the project area that may support this species include waterbodies, particularly those with a mosaic of fringing vegetation and open mudflats. Probably restricted to Lake Broadwater.
	Turnix melanogaster Black-breasted button quail	Vulnerable	Species or species habitat likely to occur within area	***Unlikely:*** No known habitat within the project area.
Mammals	*Chalinolobus dwyeri* Large-eared pied bat, large pied bat	Vulnerable	Species or species habitat may occur within area	***Possible:*** This species could be present in the project area.
	Dasyurus hallucatus Northern quoll	Endangered	Species or species habitat may occur within area	***Unlikely:*** No confirmed records within the project area.
	Nyctophilus timoriensis (South-eastern form) Greater long-eared bat	Vulnerable	Species or species habitat may occur within area	***Possible:*** This species could be present in the project area. Preferred habitat includes dry open woodland (box and/or ironbark, savannah) and mallee; particularly riparian vegetation (*Eucalyptus camaldulensis, Allocasuarina luehmannii, C. cristata* and *Callitris*), also vine thickets.
	Dasyurus maculatus Spotted-tailed quoll	Vulnerable	Species or species habitat may occur within area	***Possible:*** This species could be present in the project area. Preferred habitat includes dry open woodland (box and/or ironbark, savannah) and mallee; particularly riparian vegetation (*Eucalyptus camaldulensis, Allocasuarina luehmannii, C. cristata and Callitris*), also vine thickets.
Ray-finned fishes	*Maccullochella peelii peelii* Murray cod, cod,	Vulnerable	Species or species habitat may occur within	***Likely:*** The watercourses within the Condamine River catchment

	goodoo		area	could provide habitat for the species.
Reptiles	*Anomalopus mackayi* Five-clawed worm-skink, long-legged wormskink	Vulnerable	Species or species habitat may occur within area	***Likely***: The habitat within the project area may support this species. The species prefers low open grassland with scattered trees to open grassy dry Eucalyptus and Callitris forest/woodland. Regional Ecosystem 11.3.21 provides habitat for the species however this was not present within the project area. A draft recovery plan is being prepared for Brigalow Belt Reptiles which includes this species (WWF, 2008).
	Egernia rugosa Yakka skink	Vulnerable	Species or species habitat likely to occur within area	***Unlikely:*** No confirmed records within the project area.
	Furina dunmalli Dunmall's snake	Vulnerable	Species or species habitat may occur within area	***Present:*** This species has been historically recorded from Lake Broadwater and is also possible in other regions. Most records occur in remnant vegetation including Brigalow, open woodland and even tall forests. They may occur in any woodland or forest vegetation types within the project area, but are probably absent from disturbed vegetation.
	Paradelma orientalis Brigalow scaly-foot	Vulnerable	Species or species habitat likely to occur within area	***Present:*** This species has been previous recorded within the project area.
	Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle	Vulnerable	Species or species habitat may occur within area	***Unlikely***: Known only from the Fitzroy River catchment.

	Tympanocryptis pinguicolla Grassland earless dragon	Endangered	Species or species habitat may occur within area	***Possible:*** Regional Ecosystem 11.3.21 provides habitat for the species. It is predominantly found between Toowoomba and Cecil Plains, within grasslands, including those on roadside verges. No known records west of Wilkie Creek.
Plants	*Acacia chinchillensis* Chinchilla Wattle	Vulnerable	Species or species habitat likely to occur within area	***Present:*** Suitable habitat exists within the project area. Known and potential habitat includes flat to gently undulating plains within *Eucalyptus crebra, Callitris glaucophylla, Allocasuarina luehmannii* woodland to open forest.
	Acacia curranii Curly bark wattle	Vulnerable	Species or species habitat likely to occur within area	***Present:*** This species has previously been recorded in the north west of the project area.
	Acacia handonis Hando's wattle, Percy Grant wattle	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** This species could be present in the project area. Populations known to occur approx 10-20 km north of the project area. Potential for additional populations within Barakula SF, and in any suitable habitat adjoining Barakula SF.
	Acacia lauta	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** This species could be present in the project area. No records are known for the project area, however the known area of potential distribution overlaps with the south western extension of the project area.

	Acacia wardellii	Vulnerable	Species or species habitat likely to occur within area	***Possible;*** This species could be present in the project area. Known populations occur approx. 20-30km south of project area located. Potential to occur in remnant and regrowth habitat.
	Bothriochloa biloba Lobed blue grass	Vulnerable	Species or species habitat likely to occur within area	***Present:*** Existing database records indicate presence within the project area in grasslands and woodland on alluvium. Existing records occurs 2 km south of the Condamine River and 10 km north of Cecil Plans on roadsides).
	Cadellia pentastylis Ooline	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** This species could be present in the project area.
	Calytrix gurulmundensis	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** This species could be present in the north west project area.
	Commersonia argentea	Vulnerable	Species or species habitat likely to occur within area	***Unlikely:*** Database and literature review indicate this species is restricted locations and habitats outside of the project area.
	Denhamia parvifolia	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** This species could be present in the project area in depauperate vine thickets associated with Brigalow (Acacia harpophylla) open forest.
	Dichanthium queenslandicum King blue-grass	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** Suitable habitat exists within the project area. Preferred habitat includes remnant and non-remnant derived grasslands on alluvium, cracking clays, and basalt.
	Digitaria porrecta Finger panic grass	Endangered	Species or species habitat likely to occur	***Present:*** Existing database records indicate presence

			within area	within the project area. Suitable habitat includes non-remnant derived grasslands on alluvium and cracking clays, Brigalow/Belah, and Eucalypt woodlands on heavy alluvial soils.
	Diuris sheaffiana Tricolour diuris (*Diuris tricolor* in Qld Flora)	Vulnerable	Species or species habitat may occur within area	***Possible:*** This species could be present in the project area. Preferred habitat includes grass eucalypt woodland and open forest including *Eucalyptus populnea, E. pilligaensis*, often with *Callitris* on sandy or lateritic and landforms.
	Eucalyptus argopholoia Queensland white gum, Queensland western white gum	Vulnerable	Species or species habitat likely to occur within area	***Unlikely:*** Database records indicate known populations occur to the north of the project area on heavy alluvial soils.
	Eucalyptus virens	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** This species could be present in the project area.
	Homopholis belsonii	Vulnerable	Species or species habitat may occur within area	***Present:*** This species is known to be present in the project area. There are existing HerbRecs records 4km east of Dalby, in *Casuarina cristata* and *Acacia melvillei* vegetation on grey to black alluvial soils.
	Homoranthus decumbens	Vulnerable	Species or species habitat known to occur within area	***Possible:*** This species could be present in the project area. Database records indicate this species occurs to the north of the project area in Barakula State Forest. Suitable habitat of heaths on sandstones.
	Lepidium peregrinum Wandering pepper-cress	Endangered	Species or species habitat may occur within area	***Unlikely:*** Based on database records and literature review this species does not occur in the

				not occur in the project area.
	Macrozamia machinii	Vulnerable	Species or species habitat likely to occur within area	***Present:*** This species is known to be present in the project area in the Wondul Range area.
	Microcarpaea agonis	Vulnerable	Species or species habitat likely to occur within area	***Present:*** This species is known to be present in the project area. The record within the project area indicates a possibility of additional populations in wetland habitats.
	Philotheca sporadica	Vulnerable	Species or species habitat likely to occur within area	***Present:*** This species is known to be present in the project area. Preferred habitat includes rocky lateritic and sandstone rises and low ridges in mixed *Eucalypt/Callitris* woodlands including *Eucalyptus fibrosa* subsp. *nubila*, *E. crebra*, *E. exserta*, *Allocasuarina luehmannii*, *Callitris glaucophylla*, and *Corymbia trachyphloia*.
	Picris evae Hawkweed	Vulnerable	Species or species habitat likely to occur within area	***Present:*** This species is known from database records to be present in the project area. Preferred habitat includes eucalyptus open grassy woodland, *Dichanthium sericeum* grassland, and non-remnant roadsides, paddocks and cultivated areas.
	Prostanthera sp. Dunmore (D.M.Gordon 84)	Vulnerable	Species or species habitat likely to occur within area	***Present:*** This species is known from database records to be present in the project area
	Pterostylis cobarensis Cobar greenhood	Vulnerable	Species or species habitat	***Present:*** This species is known

	orchid		likely to occur within area	from database records to be present in the project area
	Rhaponticum australe Austral cornflower, native thistle	Vulnerable	Species or species habitat likely to occur within area	***Possible***: This species could be present in the project area. Preferred habitat includes eucalypt open forest with grassy understorey on roadsides and on road reserves, and *Eucalyptus tereticornis* and *Angophora floribunda* on black clay soil (BRI collection records, n.d.).
	Thesiumaustrale Austral toadflax, toadflax	Vulnerable	Species or species habitat likely to occur within area	***Present:*** This species is known from database records to be present in the project area Preferred habitat includes roadside remnant and non-remnant grasslands and *Eucalyptus populnea* grassy woodlands on heavy soil alluvium.
	Tylophora linearis	Endangered	Species or species habitat may occur within area	***Unlikely:*** Database records indicate this species and its habitat occurs outside of the project area.
	Westringia parvifolia	Vulnerable	Species or species habitat likely to occur within area	***Unlikely:*** Database records indicate this species and its habitat occurs outside of the project area.
	Xerothamnella herbacea	Endangered	Species or species habitat likely to occur within area	***Present:*** This species is known from database records to be present in the project area Preferred habitat is Brigalow (*Acacia harpophylla*) / Belah (*Casuarina cristata*) communities on alluvium or clay plains.

Nature and extent of likely impact

Address any impacts on the members of any listened threatened species or any threatened ecological community, or their habitat.

The proposed location of integrated production facilities and field development is unknown. Therefore the nature and extent of likely impacts is difficult to quantify. The assessment of the likelihood of threatened communities, and species being present and also the impacts to these will be undertaken during the preparation of the EIS.

Ecological communities
3D Environmental (2009) is currently undertaking field surveys as part of the EIS process, to confirm if the identified threatened communities are present or likely to be present in the project area. The brigalow (*Acacia harpophylla* dominant and co-dominant), has previously been identified within PL 198, PL 252 and PL 260. It is unknown if the other communities are present within the project area.

Arrow intends to avoid clearing of EPBC Act listed vegetation, wherever possible, and minimise clearance wherever unavoidable. Therefore direct impacts to the community are considered to be minimal. There is potential for indirect impacts such as an increase in weeds. However proposed measures to avoid or reduce impacts (see Section 4) minimise the potential for significant impacts.

As part of the EIS process a detailed assessment by flora specialists of the likelihood of impacts from the project is being undertaken.

Birds
It is currently unknown which additional EPBC Act bird species are likely to be present within the project area. Impacts could result from removal of habitat, noise and light disturbances.

Mammals
It is currently unknown which EPBC Act mammal species are likely to be present within the project area. Impacts could result from removal of habitat, noise and light disturbances.

Ray-finned fishes
The *Maccullochella peelii peelii* (Murray Cod) has the potential to occur within the Condamine River catchment. Potential impacts could occur from a decrease in water quality, elevated turbidity, restriction to fish movements or degradation of habitat. It is not proposed (as part of the project) to restrict the flow in the Condamine River or tributaries, so direct impacts to the species are not expected. Potential impacts could occur from decreases in water quality from construction of wells and associated infrastructure in close proximity to watercourses. Proposed measures to avoid or reduce impacts are provided in Section 4.

Reptiles
It is currently unknown which EPBC Act reptile species are likely to be present within the project area. Impacts could result from removal of habitat.

Plants
The proposed action could have an impact on threatened plant species from direct clearance for infrastructure or field development (causing habitat fragmentation) or from indirect impacts such as changed fire regimes, edge effects and weed infestations.

3.1 (e) Listed migratory species
Description

The EPBC Protected Matters search identified 19 migratory species as being potentially present within 5 km of the project area (Appendix 1). The list is based on the likelihood of occurrence according to distribution of species and their habitats. Table 3 shows the details from the EPBC Protected Matters search and the likelihood of occurrence within the project area using information from literature reviews. Field surveys of the project area are currently being undertaken (November 2009), which targeted locating significant species and species habitat.

The bulk of these species are wetland/water species (e.g., waders, sea eagles, egrets) whose distribution

within the local area is likely to be restricted or heavily influenced by lakes (Lake Broadwater and potentially Long Swamp).

Table 3 Listed migratory species from EPBC Protected Matters search and the likelihood of occurrence

	Species	Status	Type of presence	Likelihood of occurrence
Migratory Terrestrial Species – Birds	*Haliaeetus leucogaster* White-bellied sea-eagle	Migratory	Species or species habitat likely to occur within area	***Present:*** Previous records and identified in current surveys. Likely to be restricted to long swamp, Lake Broadwater and possibly the Condamine River.
	Hirundapus caudacutus White-throated needletail	Migratory	Species or species habitat may occur within area	***Present:*** This species was recorded within the project area during field surveys. Common and widespread.
	Merops ornatus Rainbow bee-eater	Migratory	Species or species habitat may occur within area	***Present:*** This species was recorded within the project area during field surveys. Common and widespread.
	Rhipidura rufifrons Rufous fantail	Migratory	Breeding may occur within area	***Present:*** This species was recorded within the project area during field surveys. The species prefers wet forests, of which there are none in the project area. Transient individuals are present rather than permanent populations.

	Xanthomyza phrygia Regent honeyeater	Migratory	Species or species habitat may occur within area	***Possible:*** The habitat for this species consists of dry eucalypt woodland and open forest, woodland, rural and urban areas with mature eucalypts; favours box-ironbark associations. Transient individuals from the south near Warwick have been recorded previously near the project area, however these are not permanent populations.
Migratory Wetland Species – Birds	*Ardea alba* Great egret, white egret (also the eastern great egret)	Migratory	Species or species habitat may occur within area	***Present***: This species was recorded within the project area during field surveys. Present within nearby waterbodies in the project area.
	Ardea ibis Cattle egret	Migratory	Species or species habitat may occur within area	***Possible***: The habitat within the project area may support the species. It could potentially be present within nearby waterbodies in the project area.
	Calidris acuminata Sharp-tailed sandpiper	Migratory	Species or species habitat may occur within area	***Possible***: Suitable habitats likely to be restricted to Lake Broadwater.
	Calidris ferruginea Curlew sandpiper	Migratory	Species or species habitat may occur within area	***Possible***: Suitable habitats likely to be restricted to Lake Broadwater.
	Gallinago hardwickii Latham's snipe, Japanese snipe	Migratory	Species or species habitat known to occur within area	***Present***: Previous records from the project area and recorded during current surveys.

	Nettapus coromandelianus albipennis Australian cotton pygmy-goose	Migratory	Species or species habitat may occur within area	***Possible***: There are suitable freshwater waterbodies within the project area to support the species. There have previously been records in the general area.
	Limosa limosa Black-tailed godwit	Migratory	Species or species habitat known to occur within area	***Unlikely:*** No known records. Rarely recorded from coastal habitats.
	Rostratula benghalensis s. lat. Painted snipe	Migratory	Species or species habitat may occur within area	***Present:*** The species is known from Lake Broadwater.
	Tringa glareola Wood sandpiper	Migratory	Species or species habitat known to occur within area	***Possible:*** There is suitable habitat within the project area.
	Tringa nebularia Common greenshank, greenshank	Migratory	Species or species habitat known to occur within area	***Unlikely:*** Vary rarely recorded from coastal habitats.
	Tringa stagnatilis Marsh sandpiper, little greenshank	Migratory	Species or species habitat known to occur within area	***Possible:*** There is suitable habitat within the project area.
Migratory Marine Birds	*Apus pacificus* Fork-tailed swift	Migratory	Species or species habitat may occur within area	***Possible:*** This species may migrate through the site to other areas of potential habitat.
	Ardea alba Great egret, white egret	Migratory	Species or species habitat may occur within area	***Possible***: This is a coastal species. It could potentially be present within nearby waterbodies.
	Ardea ibis Cattle egret	Migratory	Species or species habitat may occur within area	***Possible:*** The habitat within the project area may support the species.

Nature and extent of likely impact

Address any impacts on the members of any listed migratory species, or their habitat.

The proposed location of integrated production facilities and field development is currently unknown. On this basis the nature and extent of likely impacts is currently difficult to quantify. The assessment of the likelihood of migratory species being present and also the impacts to these will be undertaken during the preparation of the EIS.

Many of these species migrate through or fly over the area rather than inhabit the project area on a long term basis.

3.1 (f) Commonwealth marine area
(If the action is in the Commonwealth marine area, complete 3.2(c) instead. This section is for actions taken outside the Commonwealth marine area, that may have impacts on that area.)

Description

None present.

Nature and extent of likely impact

Address any impacts on any part of the environment in the Commonwealth marine area.

3.1 (g) Commonwealth land
(If the action is on Commonwealth land, complete 3.2(d) instead. This section is for actions taken outside Commonwealth land, that may have impacts on that land.)

Description

If the action will affect Commonwealth land also describe the more general environment. The Policy Statement titled *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* provides further details on the type of information needed. If applicable, identify any potential impacts from actions taken outside the Australian jurisdiction on the environment in a Commonwealth Heritage Place overseas.

None present.

Nature and extent of likely impact

Address any impacts on any part of the environment in the Commonwealth land. Your assessment of impacts should refer to the *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* and specifically address impacts on:

- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and the social, economic and cultural aspects of the above things.

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, or actions taken on Commonwealth land

You must describe the nature and extent of likely impacts (both direct & indirect) on the whole environment if your project:

- is a nuclear action;
- will be taken by the Commonwealth or a Commonwealth agency;
- will be taken in a Commonwealth marine area; or
- will be taken on Commonwealth land.

Your assessment of impacts should refer to the *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* and specifically address impacts on:

- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and
- the social, economic and cultural aspects of the above things.

3.2 (a)	**Is the proposed action a nuclear action?**	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (b)	**Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?**	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (c)	**Is the proposed action to be taken in a Commonwealth marine area?**	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))

3.2 (d)	**Is the proposed action to be taken on Commonwealth land?**	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))

3.3 Other important features of the environment

Provide a description of the following features of the project area and the affected area, to the extent not otherwise addressed above.

3.3 (a) Soil and vegetation characteristics

Soils in the project area are dominated by heavy clays, which form rich agricultural soils. These are characterised by self-mulching, cracking clays with a deep profile. The richness of these soils resulted in clearance of the original dense woodland for agriculture. Agricultural practices include irrigation, cropping and cattle grazing. Many paddocks have been laser-levelled to achieve efficient flood irrigation. Soil erosion occurs within the disturbed clay soils, where suitable land management practices have not been adopted. In some areas, deep incised ephemeral channels have formed.

The project area falls within the Brigalow Belt bioregion. This bioregion is characterised by dense woodland and forest communities of Brigalow (*Acacia harpophylla*), with scattered ecosystems dominated by other species including eucalypt and cypress pine, grasslands and other acacia species. Expansive areas of land have been cleared in the region for agricultural purposes. Some tracts of remnant vegetation still exist as intact patches and isolated stands.

3.3 (b) Water flows, including rivers, creeks and impoundments

The watercourses within the project area include the Condamine River, Wilkie Creek, Commoron Creek, Jimbour Creek, Balonne River and Dawson River. The surface water hydrology of the region is shown in Figure 5.

3.3 (c) Outstanding natural features, including caves

No outstanding natural features.

3.3 (d) Gradient (or depth range if action to be taken in a marine area)

The gradient within the project area is variable. Relief within the project area ranges from 645 m AHD at Mt Domville (approx 6 km south of Millmerran) to 240 m at Wondalli (southern end of project area).

3.3 (e) Buildings or other infrastructure

A range of infrastructure is currently located on the existing petroleum tenures with the project area, including:

Arrow Infrastructure:
- Central Gas Processing Facilities.
- Water Treatment Facilities.
- Associated water storage dams.
- Production and exploration wells.
- Gas and water pipelines.

Other Infrastructure:
- Residence's.
- Agricultural infrastructure.
- Road Infrastructure.
- Other industrial infrastructure (mining, etc).

Historical sites of significance within the region include:

- The All Saints Church located on the Toowoomba - Milmerran Road, 2 km north-east of Yandilla.
- The Boonarga cactoblastis memorial hall located on the Warrego Highway, Boonarga, 11 km south-east of Chinchilla.
- The Dalby War Memorial and Memorial Park located within the town of Dalby.

• The Chinchilla sands local fossil fauna site. The site is approximately 20 ha, located 3 km south-east of Chinchilla, comprising Chinchilla Rifle Range, and a contiguous section of the Condamine River bounded on the south and on the east and west by the alignments of the adjoining sections of the rifle range.

A complete assessment of historical sites of significance within the project area will be completed as part of the EIS, including an assessment of the potential impact. Project activities may have on these features.

3.3 (f) Marine areas

There are no marine areas within the vicinity of the project area.

3.3 (g) Kinds of fauna & flora

Significant tracts of fauna habitat occur around the western edges of the project area, southwest of Millmerran, and northeast of Miles. The pattern of habitat mirrors those areas recognised as being of bioregional significance and include wildlife corridors. A major wildlife corridor exists along the riparian margins of the Condamine River.

A complete assessment of flora and fauna of significance within the project area will be completed as part of the EIS, including an assessment of the potential impact project activities may have on flora and fauna.

3.3 (h) Current state of the environment in the area

Include information about the extent of erosion, whether the area is infested with weeds or feral animals and whether the area is covered by native vegetation or crops.

The project area is centred around the broad alluvial plain of the Condamine River and its associated tributaries. The productivity of the alluvial clay soils on the flood plain has resulted in heavy utilisation of these areas for agricultural purposes (predominantly tilled cropping) and remnant vegetation is largely restricted to narrow discontinuous strips along roadsides, corridors along riparian systems, or as isolated fragments on soils of less favourable physical properties.

Weeds declared under the *Land Protection (Pest and Stock Route Management) Act 2002* (Qld), have previously been observed in the project area during field surveys. These were *Opuntia stricta* (prickly pear), *Opuntia tomentose* (velvet pear), *Harrisia martini* (harrisia cactus) and *Bryophyllum delagoensis* (mother of millions). Additional weeds may also be present.

Fifteen exotic vertebrate species are known to occur within the project area. Many of these pests (cane toad, house mouse, rock dove, common mynah) are abundant.

3.3 (i) Other important or unique values of the environment

Describe any other key features of the environment affected by, or in proximity to the proposed action (for example, any national parks, conservation reserves, wetlands of national significance etc).

The following parks are located within the general area:

- Condamine Park (Karana).
- Daandine State Forest.
- Lake Broadwater Conservation Park.
- Millmerran Woods.
- Wondul Range National Park.
- Bulli State Forest.
- Whitestone State Forest.
- Gurulmundi State Forest.
- Barakula State Forest.
- Condamine State Forest.
- Braemar State Forest.
- Bendideee National Park

3.3 (j) Tenure of the action area (eg freehold, leasehold)

The land within the project area is predominantly freehold with some reserves (conservation reserve and National Park).

3.3 (k) Existing land/marine uses of area

The Surat Gas Project area is surrounded by existing petroleum operations and exploration activities. Agricultural practices are also undertaken, which include irrigation, cropping and cattle grazing. The area is also subject to mineral exploration and there are several operating and proposed mining ventures within the project area.

Some State Forests surrounding the project area also double as working forests.

3.3 (l) Any proposed land/marine uses of area

The proposed use of the land is for gas field development and associated infrastructure, as detailed in Section 2.

4 Measures to avoid or reduce impacts

The Australian Government Environment Minister may decide that a proposed action is not likely to have significant impacts on a protected matter, as long as the action is taken in a particular manner (section 77A of the EPBC Act). The particular manner of taking the action may avoid or reduce certain impacts, in such a way that those impacts will not be 'significant'. More detail is provided in the *Guideline on Particular Manner Decisions under the EPBC Act* available at the Department's web site.

For the Minister to make such a decision (under section 77A), the proposed measures to avoid or reduce impacts must:

- clearly form part of the referred action (eg be identified in the referral and fall within the responsibility of the person proposing to take the action),
- be must be clear, unambiguous, and provide certainty in relation to reducing or avoiding impacts on the matters protected, and
- must be realistic and practical in terms of reporting, auditing and enforcement.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of habitat important, specific design measures, or adoption of specific work practices.

More general commitments (eg preparation of management plans or monitoring) and measures aimed at providing environmental offsets, compensation or off-site benefits CANNOT be taken into account in making the intial decision about whether the proposal is likely to have a significant impact on a matter protected under the EPBC Act. (But those commitments may be relevant at the later assessment and approval stages if your proposal proceeds to these stages.) Refer to the Guideline on Particular Manner Decisions under the EPBC Act available at the Department's web site.

For any measures intended to avoid or mitigate significant impacts on matters protected under the EPBC Act, specify:

- what the measure is,
- how the measure is expected to be effective, and
- the timeframe or workplan for the measure.

To ensure an understanding of EPBC Act listed communities and to provide accurate mapping of the existing environment and EIS will be prepared for the project. Specialist technical studies and field surveys will be undertaken to inform site and route selection. The EIS will provide a detailed assessment of the likelihood of impacts from the project.

Site Selection

Site selection will be the primary mitigation for avoiding and reducing impacts on EPBC Act listed threatened communities and species.

The project area contains many suitable development sites that avoid large remnants of native vegetation and therefore avoid adverse impacts to significant species. Infrastructure locations will be selected to avoid EPBC Act listed communities wherever possible.

Field development site selection is dependent upon the geological properties of the underlying strata, and ongoing collection of gas reservoir data. It is therefore difficult to accurately describe proposed well site locations at this point in time. Although the geology restricts the location of the wells to some extent, there is scope to reposition proposed well sites to avoid sensitive areas at the surface. The maximum disturbance area for each new well site will be approximately 60 m by 70 m, this will be reduced to approximately 10 m by 10 m when the well becomes operational The immediate rehabilitation after construction will also reduce potential Impacts on listed threatened communities and species.

The development of detailed site selection procedures and environmental management plans for construction and operation will ensure sensitive sites are protected and that appropriate measures are in place. Procedures will involve site selection criteria dependent upon the environmental conditions, and a set of minimum acceptable standards will be applied across all sites and facilities. Sites with moderate or high environmental constraints will have significantly higher environmental management requirements. This will be managed with a set of environmental management standard operating procedures, to be held at an Arrow Energy corporate level and implemented at all sites. Accurate vegetation mapping over areas subject to immediate potential impact will be undertaken at a scale suitable for site specific planning prior to any development.

Once gas reserves within an area are proven viable, and a well site location (and access tracks) are proposed, the site will be assessed as to whether the location is ideal and has the lowest practicable impact on the environment. The following aspects will be considered in siting infrastructure:

- Whether the site is within previous clearings or non-remnant vegetation or along existing easements.
- If the location has an adequate buffer distance to remnant vegetation or natural wetlands or watercourses (using the generic recommendations made the 'Regional Vegetation Management Code for Brigalow Belt and New England Tableland (DNR&W, 2006)). Specifically clearance will not occur within 100 m of any natural wetland within 200m of any natural significant wetland, other than clearing for pipelines and access tracks.
- Whether innovative solutions such as non-linear corridors (i.e. curves and bends around patches) can be used.
- Whether the track location can avoid the repeated isolating of small parcels of remnant vegetation from more continuous tracts.
- Whether methods to avoid high density well siting (e.g., horizontal drilling) can be used to reduce fragmentation.

Once a location has been finalised, pre-construction/ pre-clearing surveys in habitats with potential for EPBC Act listed flora or fauna species within the vicinity of disturbance areas will be undertaken. The procedures for well site location will be continually refined to ensure all environmental and social constraints are considered. These procedures will be provided in detail in the EIS. Final site selection will be refined in consultation with a suitably qualified ecologist.

Additional Mitigation Measures

As detailed above, disturbance to populations of EPBC Act flora and fauna habitat will be avoided, by careful consideration to infrastructure site selection, and field development. In addition to avoidance, mitigation measures are also proposed to reduce potential indirect adverse impacts.

Flora

Vegetation disturbance will be minimised wherever possible. Well gathering system corridors will be as narrow as practicable, particularly when crossing linear corridors of vegetation (e.g. creek crossings and some roadside reserves). Well sites will also be as small as practicable (with consideration to safety measures and risk management issues). Unintended vegetation clearance will be avoided by:

- Using appropriate buffer zones.
- Marking all disturbance areas on the ground prior to clearing to ensure unnecessary or unintended impact is avoided.
- Ensuring all workers including contract plant and machinery operators are aware of the location of significant remnant vegetation and flora species and are guided by qualified personnel when clearing is undertaken.

Edge effects on native vegetation will be reduced by retaining woody debris, logs and rocks for rehabilitation and piling the items along the edge of the cleared corridor, where possible. This will also provide refugia for fauna using the area.

To reduce weed spread, all machinery involved in clearing vegetation and trench construction (including light vehicles) will be thoroughly washed prior to site access.

Fauna

Entrapment of terrestrial animals in open trenches poses a significant threat to both common and EPBC Act

listed species. Several strategies will be used to avoid these potential impacts including:

- Minimising the time trenches are open. Laying and burying of pipes is to occur as soon as possible after the trench has been excavated.
- Construction of exit points along trenches when passing through or is within near proximity of native vegetation. Trapped animals (e.g. wallabies, bettongs) may use these to exit the trench.
- Trenches will be checked and trapped frogs, lizards, snakes, mammals and other fauna removed on a daily basis prior to laying pipes and closing trenches (i.e. shortly after sunrise). Captured animals will be relocated to nearby vegetation.
- Machinery operators will be advised to keep a vigilant watch for any injured vertebrates (including snakes and lizards) resulting from clearing activities. Injured wildlife will be captured and treated by appropriately qualified specialists.
- Sediment controls and buffer zones will be implemented when working near watercourses to avoid or reduce impacts to water quality and fish.

5 Conclusion on the likelihood of significant impacts

Identify whether or not you believe the action is a controlled action (ie. whether you think that significant impacts on the matters protected under Part 3 of the EPBC Act are likely) and the reasons why.

5.1 Do you THINK your proposed action is a controlled action?

	No, complete section 5.2
X	Yes, complete section 5.3

5.2 Proposed action IS NOT a controlled action.

Specify the key reasons why you think the proposed action is NOT LIKELY to have significant adverse impacts on a matter protected under the EPBC Act.

5.3 Proposed action IS a controlled action

Type 'x' in the box for the matter(s) protected under the EPBC Act that you think are likely to be adversely impacted. (The 'sections' identified below are the relevant sections of the EPBC Act.)

	Matters likely to be impacted
	World Heritage values (sections 12 and 15A)
	National Heritage places (sections 15B and 15C)
	Wetlands of international importance (sections 16 and 17B)
X	Listed threatened species and communities (sections 18 and 18A)
X	Listed migratory species (sections 20 and 20A)
	Protection of the environment from nuclear actions (sections 21 and 22A)
	Commonwealth marine environment (sections 23 and 24A)
	Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)
	Protection of the environment from Commonwealth actions (section 28)
	Commonwealth Heritage places overseas (sections 27B and 27C)

Specify the key reasons why you think the proposed action is likely to have a significant adverse impact on the matters identified above.

Arrow is of the view that responsible site selection, design and environmental management practices will ensure the project does not have a significant adverse effect on matters of national environmental significance. However, the proposed project area covers approximately 8,000 km^2, and detailed studies of the existing environment are still underway. The EIS will provide for a detailed assessment of the likelihood of communities and species being present in the project area and the potential for project impacts. This, coupled with the uncertainty associated with infrastructure placement, leads Arrow to a precautionary view that the proposed action should be declared a controlled action and potential impacts on matters of national environmental significance assessed, as part of the Queensland EIS process.

6 Environmental history of the responsible party

NOTE: If a decision is made that a proposal needs approval under the EPBC Act, the Environment Minister will also decide the assessment approach. The EPBC Regulations provide for the environmental history of the party proposing to take the action to be taken into account when deciding the assessment approach.

		Yes	No
6.1	**Does the party taking the action have a satisfactory record of responsible environmental management?** **Provide details** Arrow Energy operates in a manner that protects and promotes the health and well-being of the environment. The company has maintained a clean environmental record since its foundation in 2000.	X	
6.2	**Has the party taking the action ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?** **If yes, provide details**		X
6.3	**If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?** **If yes, provide details of environmental policy and planning framework** Arrow has an Integrated Environmental Management System, which promotes continual improvement of environmental performance. Audits and self-assessments are undertaken to ensure compliance with this system.	X	
6.4	**Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?**	X	

Provide name of proposal and EPBC reference number (if known)

Tipton Gas Field Gas Pipeline - A referral was submitted by Arrow Energy for a 145 km buried gas pipeline from the Tipton Gas Field to supply the town of Dalby, Oakley and Wambo in QLD. The referral reference is EPBC 2004/1797. The decision of the referral was a 'not controlled action' dated 19 October 2004.

Surat to Gladstone Pipeline – this proposed high pressure gas pipeline will transport gas from near Kogan North in the Surat Basin to Gladstone on the Queensland coast. To be constructed and operated by Surat Gladstone Pipeline Pty Ltd (a wholly-owned subsidiary of Arrow Energy). An EPBC Act referral (2009/5029) has been submitted for the project which was declared a controlled action on 15 October 2009. Assessment on preliminary information was nominated as the appropriate level of assessment for potential significant impacts on listed threatened species and communities (Sections 18 and 18A).

Dalby Expansion Project – Arrow Energy proposes to submit an EPBC Act referral for the Dalby Expansion Project concurrently with this referral for the Surat Gas Project.

7 Information sources and attachments

(For the information provided above)

7.1 References

- List the references used in preparing the referral.
- Highlight documents that are available to the public, including web references if relevant.

Department of the Environment, Water, Heritage and the Arts (DEWHA). 1999. Information Sheet on RAMSAR Wetlands – Narran Lake Nature Reserve 53.

Department of the Environment, Water, Heritage and the Arts (DEWHA). 1995. Information Sheet on RAMSAR Wetlands – Shoalwater and Corio Bays Area Queensland.

Department of Natural Resources and Water (DNR&W). 2006. Regional Vegetation Management Code for Brigalow Belt and New England Tablelands Bioregion. Queensland Government, Brisbane.

WWF. 2008. Draft Queensland Brigalow Belt Reptile Recovery Plan 2007-2011. Report to the Department of the Environment and Heritage, Canberra. Australia.

7.2 Reliability and date of information

For information in section 3 specify:

- source of the information;
- how recent the information is;
- how the reliability of the information was tested; and
- any uncertainties in the information.

7.3 Attachments

Indicate the documents you have attached. All attachments must be less than two megabytes (2mb) so they can be published on the Department's website. Attachments larger than two megabytes (2mb) may delay the processing of your referral.

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	✓	Figure 1 – Surat Gas Project area showing tenement boundaries. Figure 2 – Surat Gas Project area – key features.
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	Figure 3 – Regional Ecosystems - Surat Gas Project area. Figure 4 – EPBC significant vegetation communities – Surat Gas Project area. Figure 5 – Surface water hydrology – Surat Gas Project.
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.3)		
	copies of any completed assessments to meet state or		

local government approvals and outcomes of public consultations, if available (section 2.4)		
copies of any flora and fauna investigations and surveys (section 3)		
technical reports relevant to the assessment of impacts on protected matters and that support the arguments and conclusions in the referral (section 3 and 4)		
report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		

8 Contacts, signatures and declarations

NOTE: Providing false or misleading information is an offence punishable on conviction by imprisonment and fine (s 489, EPBC Act).

Under the EPBC Act a referral can only be made by:

- the person proposing to take the action (which can include a person acting on their behalf); or
- a Commonwealth, state or territory government, or agency that is aware of a proposal by a person to take an action, and that has administrative responsibilities relating to the action[1].

Project title:

8.1 Person proposing to take action

This is the individual, government agency or company that will be principally responsible for, or who will carry out, the proposed action.

If the proposed action will be taken under a contract or other arrangement, this is:

- the person for whose benefit the action will be taken; or
- the person who procured the contract or other arrangement and who will have principal control and responsibility for the taking of the proposed action.

The Minister may also request relevant additional information from this person.

If further assessment and approval for the action is required, any approval which may be granted will be issued to the person proposing to take the action. This person will be responsible for complying with any conditions attached to the approval.

If the Minister decides that further assessment and approval is required, the Minister must designate a person as a proponent of the action. The proponent is responsible for meeting the requirements of the EPBC Act during the assessment process. The proponent will generally be the person proposing to take the action[2].

Name	s. 47F(1)
Title	Environment Manager
Organisation	Arrow Energy
ACN / ABN (if applicable)	73 078 521 936
Postal address	Level 19, AM60 42-60 Albert Street Brisbane Qld 4000 AUSTRALIA
Telephone	s. 47F(1)
Email	s. 47F(1)@arrowenergy.com.au
Declaration	I declare that the information contained in this form is, to my knowledge, true and not misleading. I agree to be the proponent for this action.
Signature	Date

[1] *If the proposed action is to be taken by a Commonwealth, state or territory government or agency, section 8.1 of this form should be completed. However, if the government or agency is aware of, and has administrative responsibilities relating to, a proposed action that is to be taken by another person which has not otherwise been referred, please contact the Referrals Business Entry Point (1800 803 772) to obtain an alternative contacts, signatures and declarations page.*

[2] *If a person other than the person proposing to take action is to be nominated as the proponent, please contact the Referrals Business Entry Point (1800 803 772) to obtain an alternative contacts, signatures and declarations page.*

8.2 Person preparing the referral information (if different from 8.1)

Individual or organisation who has prepared the information contained in this referral form.

Name	s. 47F(1)
Title	Senior Consultant
Organisation	Coffey Natural Systems
Postal address	Level 21, 12 Creek Street Brisbane, QLD 4000
Telephone	s. 47F(1)
Email	s. 47F(1) @coffey.com
Declaration	I declare that the information contained in this form is, to my knowledge, true and not misleading.
Signature	Date

If the referring party is a small business (fewer than 20 employees), estimate the time taken, in hours and minutes, to complete this form (include your time reading the instructions, working on the questions and obtaining the information and time spent by all employees in collecting and providing this information).

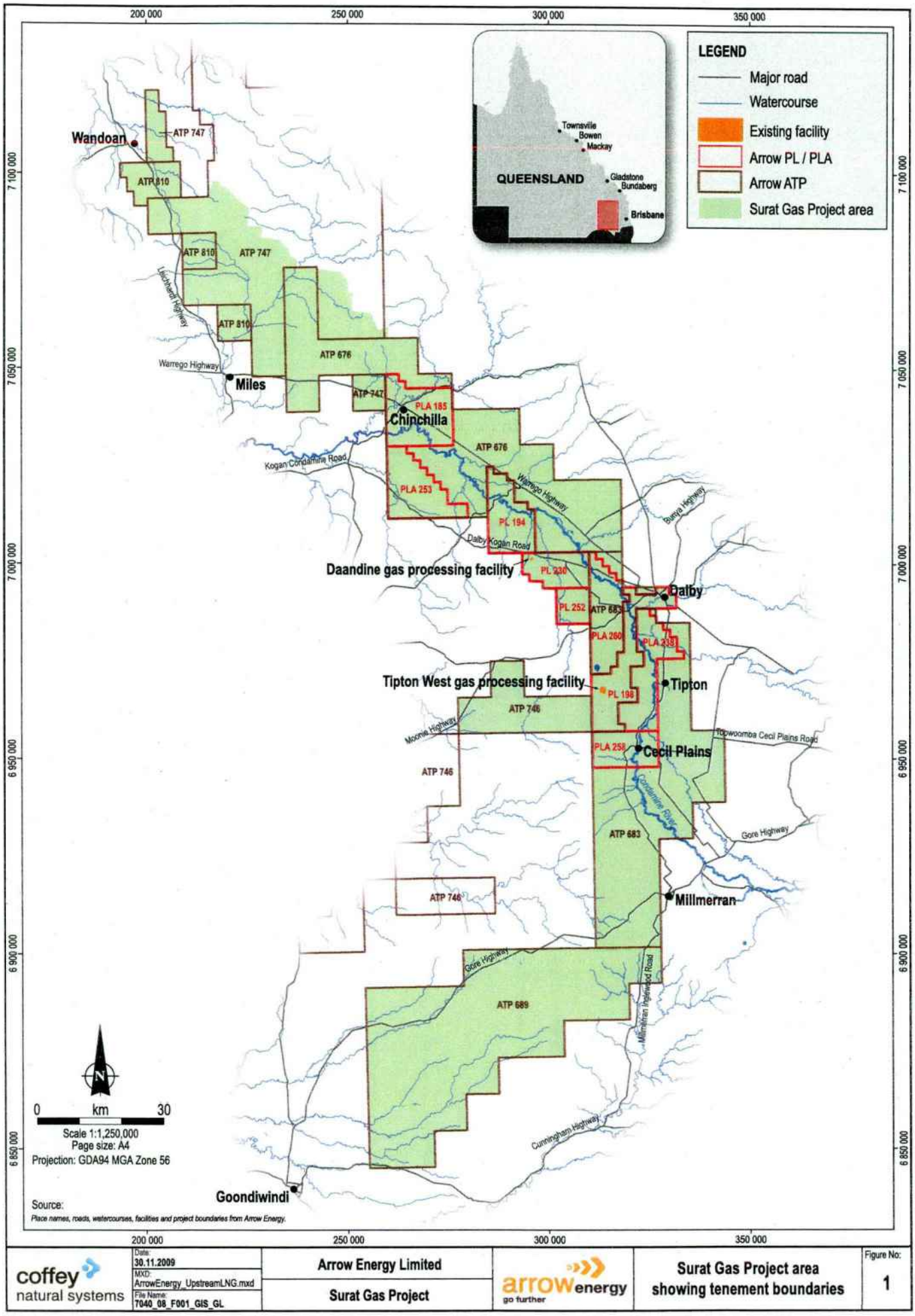
Hours	Minutes

REFERRAL CHECKLIST

NOTE: This checklist is to help ensure that all the relevant referral information has been provided. It is not a part of the referral form and does not need to be sent to the Department.

HAVE YOU:

- ☐ Completed all required sections of the referral form?
- ☐ Included accurate coordinates (to allow the location of the proposed action to be mapped)?
- ☐ Provided a map showing the location and approximate boundaries of the project area?
- ☐ Provided a map/plan showing the location of the action in relation to any matters of NES?
- ☐ Provided complete contact details and signed the form?
- ☐ Provided copies of any documents referenced in the referral form?
- ☐ Ensured that all attachments are less than two megabytes (2mb)?
- ☐ Sent the referral to the Department (electronic and hard copy preferred)?



coffey natural systems	Date: 30.11.2009 MXD: ArrowEnergy_UpstreamLNG.mxd File Name: 7040_08_F001_GIS_GL	Arrow Energy Limited Surat Gas Project	arrow energy go further
Surat Gas Project area showing tenement boundaries			Figure No: 1

DALBY EXPANSION PROJECT

EPBC ACT REFERRAL

Arrow Energy

January 2010

arrow energy

Field Development/
Production

coffey natural systems
SPECIALISTS IN PEOPLE AND PLACE

Coffey Natural Systems Pty Ltd ABN 61 005 041 878
Level 21, 12 Creek Street Brisbane QLD 4000 Australia
T (+61) (7) 3002 0400 F (+61) (7) 3002 0444
coffey.com

Project director	s. 47F(1)		
Project manager	s. 47F(1)		
Version:	**Details:**	**Approved:**	**Date:**
7040_v1	Final for exhibition	s. 47F(1)	14 January 2010

Australian Government

Department of the Environment, Water, Heritage and the Arts

Referral of proposed action

What is a referral?

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) provides for the protection of the environment, especially matters of national environmental significance (NES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the matters of NES without approval from the Australian Government Environment Minister or the Minister's delegate. (Further references to 'the Minister' in this form include references to the Minister's delegate.) To obtain approval from the Environment Minister, a proposed action should be referred. The purpose of a referral is to obtain a decision on whether your proposed action will need formal assessment and approval under the EPBC Act.

Your referral will be the principal basis for the Minister's decision as to whether approval is necessary and, if so, the type of assessment that will be undertaken. These decisions are made within 20 business days, provided that sufficient information is provided in the referral.

Who can make a referral?

Referrals may be made by or on behalf of a person proposing to take an action, the Commonwealth or a Commonwealth agency, a state or territory government, or agency, provided that the relevant government or agency has administrative responsibilities relating to the action.

When do I need to make a referral?

A referral must be made for actions that are likely to have a significant impact on the following matters protected by Part 3 of the EPBC Act:

- World Heritage properties (sections 12 and 15A)
- National Heritage places (sections 15B and 15C)
- Wetlands of international importance (sections 16 and 17B)
- Listed threatened species and communities (sections 18 and 18A)
- Listed migratory species (sections 20 and 20A)
- Protection of the environment from nuclear actions (sections 21 and 22A)
- Commonwealth marine environment (sections 23 and 24A)
- The environment, if the action involves Commonwealth land (sections 26 and 27A), including:
    - actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land);
    - actions taken on Commonwealth land that may have a significant impact on the environment generally;
- The environment, if the action is taken by the Commonwealth (section 28)
- Commonwealth Heritage places outside the Australian jurisdiction (sections 27B and 27C)

You may still make a referral if you believe your action is not going to have a significant impact, or if you are unsure. This will provide a greater level of certainty that Commonwealth assessment requirements have been met.

To help you decide whether or not your proposed action requires approval (and therefore, if you should make a referral), the following guidance is available from the Department's web site:

- the Policy Statement titled Significant Impact Guidelines 1.1 – Matters of National Environmental Significance. Additional sectoral guidelines are also available.
- the Policy Statement titled Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies.
- the interactive map tool (enter a location to obtain a report on what matters of NES may occur in that location).

Can I refer part of a larger action?

In certain circumstances, the Minister may not accept a referral for an action that is a component of a larger action and may request the person proposing to take the action to refer the larger action for consideration under the EPBC Act (Section 74A, EPBC Act). If you wish to make a referral for a staged or component referral, read 'Fact Sheet 6 Staged Developments/Split Referrals' and contact the Referral Business Entry Point (1800 803 772).

Do I need a permit?

Some activities may also require a permit under other sections of the EPBC Act. Information is available on the Department's web site.

What information do I need to provide?

Completing all parts of this form will ensure that you submit the required information and will also assist the Department to process your referral efficiently.

You can complete your referral by entering your information into this Word file.

Instructions

Instructions are provided in green text throughout the form.

Attachments/supporting information

The referral form should contain sufficient information to provide an adequate basis for a decision on the likely impacts of the proposed action. You should also provide supporting documentation, such as environmental reports or surveys, as attachments.

Coloured maps, figures or photographs to help explain the project and its location should also be submitted with your referral. Aerial photographs, in particular, can provide a useful perspective and context. Figures should be good quality as they may be scanned and viewed electronically as black and white documents. Maps should be of a scale that clearly shows the location of the proposed action and any environmental aspects of interest.

Please ensure any attachments are below two megabytes (2mb) as they will be published on the Department's website for public comment. To minimise file size, enclose maps and figures as separate files if necessary. If unsure, contact the Referral Business Entry Point for advice. Attachments larger than two megabytes (2mb) may delay processing of your referral.

Note: the Minister may decide not to publish information that the Minister is satisfied is commercial-in-confidence.

How do I submit a referral?

Referrals may be submitted by mail, fax or email.

Mail to:

Referral Business Entry Point
Environment Assessment Branch
Department of the Environment, Water, Heritage and the Arts
GPO Box 787
CANBERRA ACT 2601

- If submitting via mail, electronic copies of documentation (on CD/DVD or by email) are appreciated.

Fax to: 02 6274 1789

- Faxed documents must be of sufficiently clear quality to be scanned into electronic format.
- Address the fax to the mailing address, and clearly mark it as a 'Referral under the EPBC Act'.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

Email to: epbc.referrals@environment.gov.au

- Clearly mark the email as a 'Referral under the EPBC Act'.
- Attach the referral as a Microsoft Word file and, if possible, a PDF file.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

What happens next?

Following receipt of a valid referral (containing all required information) you will be advised of the next steps in the process, and the referral and attachments will be published on the Department's web site for public comment.

The Department will write to you within 20 business days to advise you of the outcome of your referral and whether or not formal assessment and approval under the EPBC Act is required. There are a number of possible decisions regarding your referral:

The proposed action is NOT LIKELY to have a significant impact and does NOT NEED approval

No further consideration is required under the environmental assessment provisions of the EPBC Act and the action can proceed (subject to any other Commonwealth, state or local government requirements).

The proposed action is NOT LIKELY to have a significant impact IF undertaken in a particular manner

The particular manner in which you must carry out the action will be identified as part of the final decision. You must report your compliance with the particular manner to the Department.

The proposed action is LIKELY to have a significant impact and does NEED approval

If the action is likely to have a significant impact a decision will be made that it is a *controlled action*. The particular matters upon which the action may have a significant impact (such as World Heritage values or threatened species) are known as the *controlling provisions*.

The controlled action is subject to a public assessment process before a final decision can be made about whether to approve it. The assessment approach will usually be decided at the same time as the controlled action decision. (Further information about the levels of assessment and basis for deciding the approach are available on the Department's web site.)

The proposed action would have UNACCEPTABLE impacts and CANNOT proceed

The Minister may decide, on the basis of the information in the referral, that a referred action would have clearly unacceptable impacts on a protected matter and cannot proceed.

Compliance audits

If a decision is made to approve a project, the Department may audit it at any time to ensure that it is completed in accordance with the approval decision or the information provided in the referral. If the project changes, such that the likelihood of significant impacts could vary, you should write to the Department to advise of the changes.

For more information

- call the Department of the Environment, Water, Heritage and the Arts Community Information Unit on 1800 803 772 or
- visit the web site www.environment.gov.au/epbc

All the information you need to make a referral, including documents referenced in this form, can be accessed from the above web site.

Referral of proposed action

Project title:

1 Summary of proposed action

NOTE: You must also attach a map/plan(s) showing the location and approximate boundaries of the area in which the project is to occur. Maps in A4 size are preferred. You must also attach a map(s)/plan(s) showing the location and boundaries of the project area in respect to any features identified in 3.1 & 3.2, as well as the extent of any freehold, leasehold or other tenure identified in 3.3(j).

1.1 **Short description**

Use 2 or 3 sentences to uniquely identify the proposed action and its location.

Arrow Energy (Arrow) proposes to increase the production capacity of its Surat Basin operations through the Dalby Expansion Project. The project will involve an expansion of existing gas field operations within the Tipton West, Daandine, Stratheden and Kogan North, and through the initial development of Plainview, Long Swamp and Meenawarra gas fields. The gas fields are located 20 to 40 km south and west of Dalby, in Queensland's Surat Basin.

The Dalby Expansion Project will involve the development of up to 300 new production wells, two integrated production facilities including gas compression, water treatment, power generation and high pressure gas pipelines that will connect the facilities to existing and proposed sales gas delivery infrastructure. Activities are scheduled to occur between 2010 and 2012.

Gas produced from the nominated fields will maintain supply under existing domestic gas sales agreements and confirm a viable gas supply to proposed export LNG projects.

1.2 **Latitude and longitude**

Latitude and longitude details are used to accurately map the boundary of the proposed action. If these coordinates are inaccurate or insufficient it may delay the processing of your referral.

location point	Latitude			Longitude		
	degrees	minutes	seconds	degrees	minutes	seconds
5	26	52	54.34	150	50	3.92
6	26	52	54.34	150	51	3.92
7	26	53	54.34	150	51	3.92
8	26	53	54.34	150	53	3.92
9	26	54	54.35	150	53	3.92
10	26	54	54.35	150	54	3.92
11	26	57	54.35	150	54	3.92
12	26	57	54.35	150	56	3.92
13	26	58	54.34	150	56	3.92
14	26	58	54.34	150	57	3.92
15	27	4	54.35	150	57	3.91
16	27	4	54.32	151	6	3.86
17	27	5	54.32	151	6	3.86
18	27	5	54.32	151	7	3.86
19	27	6	54.32	151	7	3.86
20	27	6	54.32	151	8	3.86
21	27	7	54.32	151	8	3.86
22	27	7	54.32	151	9	3.86
23	27	8	54.32	151	9	3.86
24	27	8	54.32	151	10	3.86
25	27	9	52.72	151	10	3.86
26	27	9	58.35	151	10	3.9
27	27	9	54.34	151	10	3.9
28	27	9	54.34	151	12	3.9
29	27	10	54.34	151	12	3.9
30	27	10	54.34	151	15	3.9
31	27	9	54.34	151	15	3.9
32	27	9	54.34	151	17	3.9
33	27	10	54.34	151	17	3.9
34	27	10	54.34	151	18	3.9
35	27	12	54.34	151	18	3.9
36	27	12	54.34	151	14	3.9
37	27	13	54.34	151	14	3.9
38	27	13	54.34	151	15	3.9
39	27	14	54.34	151	15	3.9
40	27	14	54.34	151	16	3.9
41	27	15	54.34	151	16	3.9
42	27	15	54.34	151	17	3.9
43	27	16	54.34	151	17	3.9
44	27	16	54.34	151	18	3.91
45	27	18	54.34	151	18	3.91
46	27	18	54.34	151	19	3.91
47	27	19	54.34	151	19	3.91
48	27	19	54.34	151	15	3.91
49	27	34	54.27	151	15	3.65
50	27	34	54.28	151	5	3.66
51	27	14	54.34	151	5	3.87
52	27	14	54.34	151	0	3.9
53	27	9	54.35	151	0	3.9
54	27	9	54.34	150	58	3.9
55	27	8	54.34	150	58	3.9
56	27	8	54.34	150	56	3.9
57	27	7	54.34	150	56	3.9
58	27	7	54.34	150	55	3.9
59	27	4	54.35	150	55	3.91
60	27	4	54.35	150	50	3.91

The Interactive Mapping Tool may provide assistance in determining the coordinates for your project area.

If area less than 5 hectares, provide the location as a single pair of latitude and longitude references. If area greater than 5 hectares, provide bounding location points.

If the proposed action is linear (eg. a road or pipeline), provide coordinates for each turning point.

Do not use AMG coordinates.

1.3 **Locality**

Provide a brief physical description of the project location (eg. proximity to major towns, or for off-shore projects, shortest distance to mainland).

The proposed action is located approximately 20 to 40 km west of Dalby, and 200 km west of Brisbane, Queensland. The site is within the Eastern Darling Downs Province of the Brigalow Belt South Bioregion. The following figures display the region and the existing and proposed development:

- Figure 1 shows the location of the Dalby Expansion Project.
- Figure 2 shows the current field development.
- Figure 3 shows the proposed additional field development.

1.4 **Size of the development footprint or work area (hectares)**

Field Development

Exploration activities

The area required to drill exploration and pilot wells is approximately 60 m by 70 m for each well site. Construction of small water holding dams is also required to store associated water produced during pilot testing activities (up to 5 ha).

Production wells

The approximate area required for development of production wells is initially 60 m by 70 m for each new site. Following drilling and well establishment activities, each well site is rehabilitated leaving a production area of approximately 10 m by 10 m for well operation. Wherever possible, wells will be typically set out in a grid spacing of between 700 m and 1,200 m.

Gathering pipelines and access tracks

A right of way of up to 30 m (typically 18 to 24 m) width is required to install the gas and water gathering pipelines. Permanent access tracks, approximately 3 m wide, are maintained to each well site and will be typically located adjacent to the gas and water gathering lines. Existing tracks will be used where possible. The balance of the construction right of way is rehabilitated.

Integrated Production Facilities (IPF) Development

The approximate area required for each new integrated production facility is 750 m by 350 m. This area will incorporate the central gas processing, power generation and water treatment facilities. In addition, a further approximate 100 ha is required for dams to store associated water including feed water, treated water, oily water and brine concentrate.

High Pressure Gas Pipelines

A high pressure gas pipeline, approximately 5 km long, is required to connect the new IPFs to existing sales gas delivery infrastructure. The right of way required to construct this pipeline will be approximately 30 m wide.

A similar width construction right of way is required to construct the proposed 50-km-long high pressure in-field gas pipeline that will connect the proposed Theten and Duntroon IPFs to the existing Braemar II pipeline and the proposed Surat to Gladstone Pipeline.

1.5 **Street address of the site**

Arrow's Dalby site office address is:

Arrow Energy Ltd
37 Bennie Street
Dalby Qld 4405

1.6 **Lot description**

Describe the lot numbers and title description, if known.

Due to the nature of the project and the large area covered by petroleum leases or applications for leases, numerous lots will be affected by the development. A list of affected lots can be provided on request.

1.7 **Local Government Area and Council contact (if known)**

If the project is subject to local government planning approval, provide the name of the relevant council contact officer.

The proposed Dalby Expansion Project area is located within the Western Downs Regional Council in the northwest and Toowoomba Regional Council to the southeast.

1.8 **Timeframe**

Specify the timeframe in which the action will be taken including the estimated start date of construction/operation.

Field development and associated infrastructure for the expansion is anticipated to commence in early 2010. Production wells are likely to be drilled at the rate of 10 to 15 wells per month. Each integrated production facility is expected to take 12 to 18 months to construct. The proposed facilities are expected to be constructed concurrently, with commissioning of the facilities likely in late 2011 / early 2012. Construction timeframes and commissioning dates are subject to obtaining the necessary State and Commonwealth Government approvals.

The anticipated production life for the gas wells is in excess of 20 years.

1.9	**Alternatives** Does the proposed action include alternative timeframes, locations or activities?	X	No
			Yes, you must also complete section 2.2
1.10	**State assessment** Is the action subject to a state or territory environmental impact assessment?		No
		X	Yes, you must also complete Section 2.4
1.11	**Component of larger action** Is the proposed action a component of a larger action?	X	No
			Yes, you must also complete Section 2.6
1.12	**Related actions/proposals** Is the proposed action related to other actions or proposals in the region (if known)?		No
		X	Yes, provide details: The Dalby Expansion Project satisfies Arrow's need to meet its contractual obligations under current domestic gas supply agreements, as well as proving that a viable gas supply exists for proposed export LNG developments at and adjacent to Gladstone. Gas produced from the nominated facilities will be initially used to supply residential, commercial

and industrial customers and in power generation for sale of electricity to the National Electricity Market. Supply over domestic market requirements will later be directed to proposed LNG developments if they achieve the necessary environmental approvals and financial commitments.
The Surat Gas Project, for which a separate referral has been prepared and will be lodged concurrently with this referral, will facilitate further development of Arrow's Surat Basin coal seam gas reserves to meet the demand expected from proposed export LNG developments.

The Surat Gas Project encompasses some 8,000 km^2 of the Surat Basin, with the project area extending from Wandoan in the north to Goondiwindi in the south, in an arc through Dalby. The Surat Gas Project area encompasses the Dalby Expansion Project area as shown in Figure 4. That project (the Surat Gas Project) will assess the environmental, social and economic impacts associated with development of infrastructure and facilities not described in this referral. A voluntary Environmental Impact Statement under the *Environment Protection Act 1994* (Qld) is being prepared by Arrow for the Surat Gas Project.

The Dalby Expansion Project, a continuation of existing operations, will be assessed under the *Environment Protection Act 1994* (Qld), as a Level 1 petroleum activity not requiring an EIS.

Related projects that facilitate delivery of coal seam gas to proposed export LNG developments and the developments themselves are:

Surat to Gladstone Pipeline – this proposed high pressure gas pipeline will transport gas from near Kogan North in the Surat Basin to Gladstone on the Queensland coast. To be constructed and operated by Surat Gladstone Pipeline Pty Ltd, it will supply proposed LNG developments adjacent to Gladstone. An EIS under the Environment Protection Act has been prepared for the proposed pipeline. An EPBC Act referral (2009/5029) has been submitted for the project which was declared a controlled action on 15 October 2009. Assessment on preliminary information was nominated as the appropriate level of assessment for potential significant impacts on listed threatened species and communities (Sections 18 and 18A).

Gladstone LNG Project – LNG Ltd proposes the development of an initial 1.5 Mtpa LNG plant on Fisherman's Landing north of Gladstone. The proposed plant is expected to take feed gas supply from the proposed Surat to Gladstone Pipeline. An EIS under the Environment Protection Act has been prepared for the proposed facility. The proposed action was referred (2008/3954) and it was determined that is was not a controlled action on 1 February 2008.

Shell Australia LNG Project – Shell CSG (Australia) Pty Ltd (Shell) proposes the development of an up to 16 Mtpa LNG facility on Curtis Island off Gladstone, Queensland. The proposed plant is expected to take feed gas supply from the proposed Surat to Gladstone Pipeline. Shell is preparing an EIS under the *State Development and Public Works Organisation Act 1970* (Qld) for the project. Two EPBC Act referrals have been lodged for this project, one for the proposed feed gas pipeline, a short section of pipeline from near the Gladstone City Gate to the LNG plant (2009/5008) and a second for the LNG facility including plant and marine loading facility (2009/5007). The proposed development has been declared a controlled action and the Queensland EIS process accredited as the appropriate level of assessment.

1.13	**Australian Government funding** Has the person proposing to take the action received any Australian Government grant funding to undertake this project?	X	No
			Yes, provide details:

2 Detailed description of proposed action

NOTE: It is important that the description is complete and includes all components and activities associated with the action. If certain related components are not intended to be included within the scope of the referral, this should be clearly explained in section 2.6.

2.1 Description of proposed action

This should be a detailed description outlining all activities and aspects of the proposed action and should reference figures and/or attachments, as appropriate.

Arrow proposes to expand its operations within existing and new petroleum tenements in the Surat Basin in South East Queensland. Figure 2 shows the current field development, as Petroleum Leases (PLs) and Petroleum Lease Applications (PL(A)s) within the project area. The activities are summarised in Table 1 and are provided in more detail below. Figure 3 shows the location of proposed new field development, compression and water treatment facilities and power generation infrastructure.

Gas from the Dalby Expansion Project will be used to maintain supply under existing domestic gas sales agreements, and to confirm a viable gas supply for identified liquefied natural gas (LNG) opportunities that may commence production from 2012.

Table 1 Expansion activities

Field Development	
Production wells and associated infrastructure	300 production wells and associated well infrastructure including gas and water gathering lines, communications cables and access tracks.
Integrated Production Facilities Development	
Gas processing facilities	Two new electric motor driven integrated production facilities (IPFs) with a maximum daily output of 85 TJ/d each. These include: • New facility at Theten (PL 230). • New facility at Duntroon (PL 198) which is adjacent to the existing Tipton West facility. A facility at Lynwood North is also proposed as a back-up option to the proposed Duntroon facility which remains subject to the outcome of land access negotiations and other clearances.
Water treatment facilities and disposal	• Potentially expanding water treatment facilities at Tipton West (PL 198). This is within the scope of the current Environment Authority and assessment is being undertaken by the Queensland Department of Environment and Resource Management. • A new reverse osmosis water treatment (ROWT) facility at Theten and Duntroon (or Lynwood North), and associated feed water dams, brine concentrate holding dams and treated water dams.
Power supply or generation	New power generation and distribution infrastructure to facilitate power distribution to IPFs, water treatment facilities and production wells located at Theten, and Duntroon (or Lynwood North).
Pipeline connections	• An approximate 5-km-long high pressure gas pipeline from new IPFs to existing sales gas delivery infrastructure. • A proposed 50-km-long high pressure in-field gas pipeline that will connect the proposed Theten, Duntroon IPFs and Lynwood North (if required) to the proposed Surat to Gladstone Pipeline.

Note: All field development and integrated production facilities development are being assessed through the Queensland Department of Environment and Resource Management.

FIELD DEVELOPMENT

Production wells and associated infrastructure

Arrow proposes to establish 300 production wells, as a continuation of its current activities. Where possible, the wells will be typically set out in a grid with a spacing of between 700 m and 1,200 m. The proposed development areas are shown on Figure 3.

To ensure safe operation of the drilling rig and associated equipment, the well drilling sites normally involve an area of approximately 60 m by 70 m. This is sufficiently large enough for a truck mounted drilling rig, with space around the rig for work related access and materials handling. Prior to drilling a well, a temporary site is prepared. Preparation generally involves:

- Vegetation clearance or trimming.
- Levelling of a drill pad if necessary.
- Excavation and construction of temporary pits to hold drilling fluids and water produced during drilling.
- Excavation of a pit for a ground flare.

Once wells are installed, the well site footprint is reduced to approximately 10 m by 10 m. The site is fenced to enclose the wellhead and other infrastructure (wellhead gas/water separator, control valve, monitoring, metering and communications equipment). The fenced well sites prevent stock and public access to the wellhead. The larger drilling site footprint is then rehabilitated to a land use consistent with surrounding area, or to a standard agreed with the landholder. Farming and grazing activities can continue as normal around established well sites.

If the land use is native vegetation, then site rehabilitation will utilise suitable native tree and grass species (where possible the species will be specific to the original ecosystem). Natural re-seeding of native species is likely to occur if there has been stock piling of removed topsoil, which is reused in rehabilitation. Native vegetative waste will also be spread over disturbed areas to provide a natural source of seed and additional fauna refuge. Use of native grass (or native alternative) species from inland southern Queensland will be undertaken when rapid vegetative cover is required to prevent soil loss.

There will be low-pressure gathering lines to take gas from the wells to the IPFs for compression. Water gathering lines will also be required to transfer associated water from wells to water treatment facilities.

New water and gas gathering lines will be constructed of small diameter high-density polyethylene (HDPE) pipe. Gathering lines will be buried at a minimum depth of 750 mm. The location of gathering lines and utility trenches will be agreed with landholders to minimise disruption to agricultural activities and to minimise the potential for damage to the gathering lines from agricultural machinery. Locating infrastructure within or adjacent to existing farm tracks and cultivation lines is generally favourable.

Table 2 outlines the proposed development and the number of wells proposed per petroleum lease.

Table 2 Proposed well development

Petroleum Lease	Number of Existing Production Wells	Number of New Production Wells	Total Number of Production Wells
PL 194	64	**35**	99
PL 198	140	**25**	165
PL 230	72	**40**	112
PL 252	0	**50**	50
PL 238	0	**50**	50
PL(A) 258	0	**50**	50
PL(A) 260	0	**50**	50
Total	**276**	**300**	**576**

INTEGRATED PRODUCTION FACILITIES

Central Gas Processing Facilities

Compression facilities receive gas from the gathering lines, and compress and dewater the gas, prior to directing it to sales gas pipelines. Arrow proposes to construct two new electric motor driven IPFs on PL 230 and PL 198. These facilities are called the Theten IPF and the Duntroon IPF (the latter being a new facility located adjacent to the existing facility). The facilities will each have a maximum daily output of approximately 85 TJ/d.

The Lynwood North facility is proposed as a back-up option to the proposed Duntroon facility which remains subject to the outcome of land access negotiations.

Each facility will include a control room to monitor field development. There will also be service buildings, offices and a flare system. Communication between facilities will be via fibre optic link.

Arrow proposes to co-locate central gas processing, water treatment and power generation facilities.

The proposed IPF sites have been selected on the grounds of environmental sensitivity and ease of construction and operation. Flora and fauna constraints mapping has been undertaken to ensure that facility sites have minimal impact on sensitive ecological values.

Water Treatment Facilities and Disposal

Expansion of Existing Facilities

A reverse osmosis water treatment plant is currently being commissioned at Daandine with a new purpose built fully lined feed water dam, clay lined treated water dam, and a lined waste water dam. Brine concentrate is discharged into an existing dam recently recertified for this purpose.

On current forecasts, Tipton West (adjacent to the Duntroon site) may require expansion of its capabilities by mid 2010, depending on the production forecasts and timing of construction of the Duntroon facility. The expansion would comprise a reverse osmosis water treatment plant, new feed and treated water dams, with brine handling managed in existing dams, which will be certified as fit for purpose. The expansion of the facilities will be assessed by the Queensland Department of Environment and Resource Management.

New Facilities

Two new reverse osmosis water treatment facilities will be constructed. These will be co-located with the new central gas processing facilities at Theten and Duntroon as shown in Figure 3. The water treatment facilities will also be proposed at the Lynwood North site, if the Duntroon site provides to be unviable.

The new water treatment facilities are each proposed to include a fully lined feedwater dam, unlined treated water dam, nominally two lined concentrated brine dams, and a lined wastewater dam.

Potential beneficial uses for treated water are being investigated by Arrow. The current base-case water management strategy is to use the treated water for irrigation within the vicinity of proposed operations. Delivery points target existing irrigation infrastructure, however it is possible that additional infrastructure will be constructed to manage the increased supply of water for irrigation. Once the beneficial reuse planning is finalised, any new infrastructure required will be assessed by the Queensland Department of Environment and Resource Management and will be referred to DEWAH under the EPBC Act if required.

DEWHA

Arrow, in conjunction with other Surat Basin coal seam gas producers, is also considering a long-term aggregated solution for water treatment, treated water distribution and brine disposal.

Power Supply or Generation

Arrow proposes to construct gas-engine driven power stations at each integrated facility site. The approximate output of each power station would be 30 to 40 MW. Power station sizing has been determined by overall power requirements for gas compression, water treatment and wells associated with the facility. The latter would only be electric powered where practicable. In all other instances they would be powered by gas driven generators at the production well site.

Initial wells will be powered using gas driven generation sets located at the well site.

Gas from the field gathering system will be fed directly to the power station gas-engine generators. Facilities will be put in place at the inlet of the power station to control any free water and / or particulates which may be present in the gathering piping.

Power from the stations will be used within the facility footprint area to meet the power requirements for gas compression and water treatment. Power will also be distributed to the adjacent gas field via a combination of overhead and underground cabling located within service corridors.

High Pressure Gas Pipelines

A proposed 50-km-long high pressure in-field gas pipeline will connect the proposed Theten and Duntroon IPFs to the existing Braemar II pipeline and the proposed Surat to Gladstone Pipeline near Kogan North. In the event that the Lynwood North facility is progressed in favour of the Duntroon facility, the proposed high pressure pipeline would be extended south to Lynwood North.

The high pressure gas pipeline route has been selected (as for all infrastructure in the Dalby Expansion Project) to avoid areas of moderate or high environmental sensitivity / constraints and activity based environmental management processes and controls will apply (as for gathering lines). The proposed pipeline route is shown on Figure 5. The detailed route of the pipeline within this general alignment will be dependent on land access negotiations and the application of the Arrow's Environmental Management Standard Operating Procedure for Site Selection, including reference to environmental constraints maps.

The pipeline will be designed, constructed and decommissioned in accordance with Australian Standard 2885 and any additional requirements adopted for the Surat to Gladstone Pipeline.

Final Decommissioning and Rehabilitation

Wells will be decommissioned when they reach the end of their useful life. All surface equipment will be removed, the well casing will be cut off (approximately 1.5 m) below the ground surface and the well hole plugged with concrete. The well site fence will be removed and the site rehabilitated to a land use consistent with the local area, or as agreed with the landholder. Rehabilitation may involve reinstatement of original contours, regrading surface topsoils, ensuring erosion controls are in place, and re-establishing drainage lines and pasture species (or alternative arrangements agreed with the landholder).

All other infrastructure will be removed from the site (IPF, water treatment facilities, power supply) and the land rehabilitated to its former land use (where possible). Water dams and access tracks may be useful for landholder. An agreement will be in place if infrastructure is to remain for landholder purposes.

2.2 Alternative locations, time frames or activities that form part of the referred action

If you have identified that the proposed action includes alternative timeframes, locations or activities (in section 1.9) you must complete this section. Describe any alternatives related to the physical location of the action, time-frames within which the action is to be taken and alternative methods or activities for undertaking the action. Please note, if the action that you propose to take is determined to be a controlled action, any alternative locations, timeframes or activities that are identified here may be subject to environmental assessment and a decision on whether to approve the alternative.

Facility sites have been selected with consideration environmental conditions and ease of construction and operation. Well sites locations will also be selected using analysis of environmental conditions to ensure minimal impact on the environment.

Environmental constraints mapping has been conducted to ensure that the environmental values are clearly identified and known within the project area. A series of fieldwork investigations have also been undertaken to validate desktop selection.

2.3 Context, planning framework and state/local government requirements

Explain the context in which the action is proposed, including any relevant planning framework at the state and/or local government level (eg. within scope of a management plan, planning initiative or policy framework). Describe any Commonwealth or state legislation or policies under which approvals are required or will be considered against.

Arrow currently holds five Environmental Authorities (EAs) for the petroleum tenements associated with the Dalby Expansion Project (PLs 194, 198, 230, 238 and 252). In addition, Arrow has applied for environmental authorities for PL(A)s 258 and 260.

2.4 Environmental impact assessments under Commonwealth, state or territory legislation

If you have identified that the proposed action will be or has been subject to a state or territory environmental impact statement (in section 1.10) you must complete this section. Describe any environmental assessment of the relevant impacts of the project that has been, is being, or will be carried out under state or territory legislation. Specify the type and nature of the assessment, the relevant legislation and the current status of any assessments or approvals. Where possible, provide contact details for the state/territory assessment contact officer.

Describe or summarise any public consultation undertaken, or to be undertaken, during the assessment. Attach copies of relevant assessment documentation and outcomes of public consultations (if available).

An environmental authority is required for development of petroleum tenements granted and regulated under the *Petroleum and Gas (Production and Safety) Act 2004* (Qld). Dalby Expansion Project activities are level 1 petroleum activities for which an environmental authority under the *Environment Protection Act 1994* (Qld) is required. Environmental authorities are granted by the Queensland Department of Environment and Resources Management (DERM) and are the primary statutory documents used by DERM in its regulatory role to ensure environmental compliance of the project.

Dalby Expansion Project activities will be assessed and approved by amendment (and consolidation) of existing environmental authorities held by Arrow for the nominated petroleum tenements. An Environmental Management Plan (EM Plan) prepared by Arrow provides the information required by DERM to assess the application to amend (and consolidate) the environmental authorities into a project environmental authority.

2.5 Consultation with Indigenous stakeholders

Where Indigenous stakeholders are likely to be affected by your proposed action, your referral should describe any consultations undertaken with Indigenous stakeholders. Identify the relevant stakeholders and the status of consultations at the time of the referral.

Cultural Heritage

Arrow is currently finalising a review of its records to better understand the nature and scope of cultural heritage surveys that have occurred to date over its existing tenements. This work should be completed in the near future.

Arrow anticipates commencing the process for development of a Cultural Heritage Management Plan (CHMP) as required to comply with the *Aboriginal Cultural Heritage Act 2003* (Qld) in the first quarter of 2010. The CHMP will involve extensive consultation with Aboriginal parties and contain management and mitigation measures for Aboriginal cultural heritage during exploration, construction and operation phases of the project.

Native Title

Arrow has completed a review of its tenements to identify an order of priority for its operations. It is intended that Future Act processes as outlined in the *Native Title Act 1993* (Cwlth) will be followed to obtain the necessary approvals for Future Acts that may have an impact on native title rights and interests.

Arrow will seek to utilise both the voluntary and statutory processes outlined in the legislation and intends to commence the process in the first quarter of 2010, which will involve extensive consultation with Native Title parties.

2.6 A staged development or component of a larger project

If you have identified that the proposed action is a component of a larger action (in section 1.11) you must complete this section. Provide information about the larger action and details of any interdependency between the stages/components and the larger action. You may also provide justification as to why you believe it is reasonable for the referred action to be considered separately from the larger proposal (eg. the referred action is 'stand-alone' and viable in its own right, there are separate responsibilities for component actions or approvals have been split in a similar way at the state or local government levels).

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest.

Your assessment of likely impacts should refer to the following resources (available from the Department's web site):

- specific values of individual World Heritage properties and National Heritage places and the ecological character of Ramsar wetlands;
- profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;
- *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*; and
- associated sectoral and species policy statements available on the web site, as relevant.

Note that even if your proposal will not be taken in a World Heritage area, Ramsar wetland, Commonwealth marine area, or on Commonwealth land, it could still impact upon these areas (for example, through downstream impacts). Consideration of likely impacts should include both direct and indirect impacts.

The approach to field development will follow environmental procedures developed to minimise impacts on significant environmental values (both State and Commonwealth). As there are existing operations within the project area, the procedures currently used will be implemented for siting new infrastructure. EPCB Act EPBC matters of national environmental significance have high environmental value and therefore stringent criteria for field development will be in place to avoid or minimise impacts on these values.

3.1 (a) World Heritage Properties

Description

None present.

Nature and extent of likely impact

Address any impacts on the World Heritage values of any World Heritage property.

3.1 (b) National Heritage Places

Description

None present.

Nature and extent of likely impact

Address any impacts on the National Heritage values of any National Heritage place.

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

The Dalby Expansion Project will be undertaken within the same catchment as the Narran Lake Nature Reserve, RAMSAR site. This site is located in the north west of NSW and is a significant site for water bird breeding (DEWHA 1999).

Nature and extent of likely impact

Address any impacts on the ecological character of any Ramsar wetlands.

The reserve covers part of a large terminal wetland of the Narran River at the end of the Condamine River (which flows from Queensland). The site is downstream of the project area and over 600 km to the southwest. There is a low likelihood of significant impacts on the nature reserve.

				community.
	Weeping myall woodlands	Endangered	Community likely to occur within area	***Unlikely:*** This community is restricted to small patches that occur within two Regional Ecosystems in Queensland. These are 11.3.2 and 11.3.28. Only 11.3.2 is present within the project area however this is unlikely to support the weeping myall woodlands. Field surveys failed to locate the community.
	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area	***Unlikely:*** This community is unlikely to be present in the area. Queensland Regional Ecosystem mapping does not identify it as being present. Field surveys failed to locate the community.
Birds	*Anthochaera phrygia* Regent honeyeater	Endangered	Species or species habitat may occur within area	***Unlikely:*** The habitat for this species consists of dry eucalypt woodland and open forest, woodland, rural and urban areas with mature eucalypts; favours box-ironbark associations. The Regional Ecosystem mapping and field surveys indicate that there is limited habitat in the project area. Transient individuals from the south near Warwick have been recorded previously near the project area, however these are not permanent populations.
	Erthrottriorchis radiatus Red goshawk	Vulnerable	Species or species habitat likely to occur within area	***Unlikely:*** There is a record of the species from Lake Broadwater, however this is expected to be of a transient individual, not permanent populations. The present habitat is unlikely to be occupied by the species.

3.1 (d) Listed threatened species and ecological communities

Description

The EPBC Protected Matters search undertaken on 29 October 2009 identified 24 threatened species and 4 ecological communities as being potentially present within 5 km of the project area (Appendix 1). Threatened species included 6 birds, 3 mammals, 1 fish, 3 reptiles and 11 plants.

This list is based on the likelihood of occurrence according to distribution of species and their habitats from various government databases. To further assess if any additional EPBC Act listed species could potentially be present within the project area, both flora and fauna database searches were also undertaken.

For flora, the databases included DERM's Regional Ecosystem digital data, the Queensland Herbarium's HerbRecs database (extract August, 2009), DERM's WildNet database (which incorporates HerbRecs specimen data, CORVEG site data and may also include information from research and monitoring programs, inventory programs including extension activities, literature records, wildlife permit returns and community programs). An analysis of aerial photography of the area was also undertaken to assist in vegetation mapping. One flora species, *Bothriochloa biloba* (lobed blue grass) was identified through the DERM WildNet database and the Queensland Herbarium database as being recorded in the surrounding area. The species did not register in the EPBC Protected Matters Search. This species has been included in the assessment (resulting in a total of 12 plants).

For fauna, the information sources included Birds Australia Atlas database, DERM's WildNet database and specimen records held by the Queensland museum. One fauna species, *Dasyurus maculates* (spotted-tailed quoll) was identified through the WildNet database as being recorded in the project area, which did not register in the EPBC Protected Matters Search. This species has been included in the assessment (resulting in a total of 4 mammals).

Field surveys of the project area were undertaken in October and November 2009. The surveys targeted locating significant species and species habitat. Surveys also aimed to verify database and DERM's Regional Ecosystem mapping. A total of 85 flora sites were surveyed within the project area. The details of the searches and surveys are summarised below and provided in full in Appendix 2.

Table 3 shows the details of the EPBC Protected Matters search. The likelihood of occurrence was assessed using information from literature reviews and searches of additional databases and also from the October and November 2009 field surveys. Field surveys identified the brigalow ecological community, but failed to locate any EPBC Act listed flora or fauna species (excluding migratory species which are outlined in Section 3.1 (e)).

Table 3 Listed threatened species and ecological communities from EPBC Protected Matters Search and the likelihood of occurrence.

	Species	Status	Type of presence	Likelihood of occurrence
Ecological communities	Brigalow (*Acacia harpophylla* dominant and codominant)	Endangered	Community known to occur within area	***Present:*** This community has been identified within in the project area. The community encompasses RE's 11.9.5, 11.4.3 and 11.3.1 as well as a number of advanced regrowth brigalow communities.
	Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	Critically Endangered	Community likely to occur within area	***Unlikely:*** This community is unlikely to be present in the area. Queensland Regional Ecosystem mapping does not identify it as being present. Field surveys failed to locate the

	Geophaps scripta scripta Squatter pigeon (southern)	Vulnerable	Species or species habitat likely to occur within area	***Unlikely:*** There have been no previous database records within the project area. The species is predominantly found north of Millmerran.
	Lathamus discolor Swift parrot	Endangered	Species or species habitat may occur within area	***Unlikely:*** There have been no previous database records within the project area. The species is predominantly found south of Chinchilla.
	Neochmia ruficauda ruficauda Star finch (eastern), star finch (southern)	Endangered	Species or species habitat likely to occur within area	***Unlikely:*** There have been no previous database records within the project area. The species is predominantly found south of Chinchilla.
	Rostratula australis Australian painted snipe	Vulnerable	Species or species habitat may occur within area	***Possible***: The habitat within the project area that may support this species include waterbodies, particularly those with a mosaic of fringing vegetation and open mudflats. Suitable habitat is restricted to Lake Broadwater and the vicinity immediately north at Long Swamp. The Birds Australia and WildNet databases indicate that this species has been recorded in the vicinity of the project area.
Mammals	*Chalinolobus dwyeri* Large-eared pied bat, large pied bat	Vulnerable	Species or species habitat may occur within area	***Unlikely:*** This species is known to inhabit caves and overhangs and higher altitude moist tall open forest adjacent to rainforest. There is limited habitat in the project area.
	Dasyurus hallucatus Northern quoll	Endangered	Species or species habitat may occur within area	***Unlikely:*** The northern quoll lives in a range of open woodland and forests, with dens in rock crevices, tree holes or termite mounds. There is limited habitat in the project area.

	Nyctophilus timoriensis (South-eastern form) Greater long-eared bat	Vulnerable	Species or species habitat may occur within area	***Unlikely***: Preferred habitat includes dry open woodland (box and/or ironbark, savannah) and mallee; particularly riparian vegetation (*Eucalyptus camaldulensis, Allocasuarina luehmanni, A. cristata and Callitris*), also vine thickets. There is limited habitat in the project area. Not located during the recent field surveys and no confirmed recorded species within the project area.
	Dasyurus maculatus Spotted-tailed quoll	Vulnerable	Species or species habitat may occur within area	***Unlikely***: Preferred habitat includes dry open woodland (box and/or ironbark, savannah) and mallee; particularly riparian vegetation (*Eucalyptus camaldulensis, Allocasuarina luehmanni, A. cristata and Callitris*), also vine thickets. There is limited habitat in the project area. Not located during the recent field surveys.
Ray-finned fishes	*Maccullochella peelii peelii* Murray cod, cod, goodoo	Vulnerable	Species or species habitat may occur within area	***Likely:*** The watercourses within the Condamine River catchment could provide habitat for the species.

Reptiles	*Anomalopus mackayi* Five-clawed worm-skink, long-legged wormskink	Vulnerable	Species or species habitat may occur within area	***Possible***: The habitat within the project area may support this species. The species prefers low open grassland with scattered trees to open grassy dry Eucalyptus and Callitris forest/woodland. Regional Ecosystem 11.3.21 provides habitat for the species however this was not present within the project area. A draft recovery plan is being prepared for Brigalow Belt Reptiles which includes this species (WWF, 2008).
	Furina dunmalli Dunmall's snake	Vulnerable	Species or species habitat may occur within area	***Possible:*** The habitat within the project area may support this species. Historic records are known from Lake Broadwater. Most records occur in remnant vegetation including Brigalow, open woodland and even tall forests. They may occur in any woodland or forest vegetation types within the project area, but are probably absent from disturbed vegetation.
	Tympanocryptis pinguicolla Grassland earless dragon	Endangered	Species or species habitat may occur within area	***Possible:*** Regional Ecosystem 11.3.21 (this was not present within the project area) provides habitat for the species. It is predominantly found between Toowoomba and Cecil Plains, within grasslands, including those on roadside verges. No known records west of Wilkie Creek.
Plants	*Acacia chinchillensis* Chinchilla Wattle	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** Suitable habitat exists within the project area (within Regional Ecosystem 11.5.1). Potential habitat

				includes flat to gently undulating plains within *Eucalyptus crebra, Callitris glaucophylla, Allocasuarina luehmannii* woodland to open forest. Targeted searches in suitable habitat failed to locate this species during field assessments. Potential to occur is low but still possible.
	Bothriochloa biloba Lobed blue grass	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** Suitable habitat exists within the project area. Database records exist of the species within the project area (2 km south of the Condamine River and 10 km north of Cecil Plans on roadsides).
	Cadellia pentastylis Ooline	Vulnerable	Species or species habitat likely to occur within area	***Unlikely:*** No previous records in vicinity. Sub optimal habitat exists within the project area.
	Dichanthium queenslandicum King blue-grass	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** Suitable habitat exists within the project area. Preferred habitat includes remnant and non-remnant derived grasslands on alluvium, cracking clays, and basalt. No previous records within the project area.
	Digitaria porrecta Finger panic grass	Endangered	Species or species habitat likely to occur within area	***Possible:*** Suitable habitat exists within the project area. Preferred habitat includes non-remnant derived grasslands on alluvium and cracking clays, Brigalow/Belah, and Eucalypt woodlands on heavy alluvial soils. Targeted searches failed to locate this species during field assessments. There are existing HerbRecs records of the species within the project area.
	Diuris sheaffiana Tricolour diuris	Vulnerable	Species or species habitat may occur	***Unlikely:*** No records in the vicinity. Sub optimal habitat exists

			within area	optimal habitat exists within the Project Area. Preferred habitat includes grass eucalypt woodland and open forest including *Eucalyptus populnea, E. pilligaensis*, often with *Callitris* on sandy or lateritic and landforms.
	Homopholis belsonii	Vulnerable	Species or species habitat may occur within area	***Possible:*** Suitable habitat exists within the project area. There are existing HerbRecs records of the species 4km east of Dalby, in *Casuarina cristata* and *Acacia melvillei* vegetation on grey to black alluvial soils. Has potential to occur in *Acacia harpophylla* and/or *Casuarina cristata* shrubby open forests on Cainozoic clay plains and regrowth types and may be associated with road reserves.
	Philotheca sporadica	Vulnerable	Species or species habitat likely to occur within area	***Likely:*** Suitable habitat exists within the project area. Preferred habitat includes rocky lateritic and sandstone rises and low ridges in mixed *Eucalypt/Callitris* woodlands including *Eucalyptus fibrosa* subsp. *nubila*, *E. crebra*, *E. exserta*, *Allocasuarina luehmannii*, *Callitris glaucophylla*, and *Corymbia trachyphloia*. Targeted searches failed to locate the species. However it has previously been recorded in the project area.
	Picris evae Hawkweed	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** Suitable habitat exists within the project area. Preferred habitat includes eucalyptus open grassy woodland, *Dichanthium sericeum*

				grassland, and non-remnant roadsides, paddocks and cultivated areas. Targeted searches failed to locate the species. However it has previously records exist (30 km south east of the project area).
	Rhaponticum australe Austral cornflower, native thistle	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** No records in vicinity. Sub optimal habitat exists within the Project Area Preferred habitat includes eucalypt open forest with grassy understorey on roadsides and on road reserves, and *Eucalyptus tereticornis* and *Angophora floribunda* on black clay soil (BRI collection records, n.d.).
	Thesium australe Austral toadflax, toadflax	Vulnerable	Species or species habitat likely to occur within area	***Possible:*** Suitable habitat exists within the project area. There are previous database records within the project area. Preferred habitat includes roadside remnant and non-remnant grasslands and *Eucalyptus populnea* grassy woodlands on heavy soil alluvium.
	Tylophora linearis	Endangered	Species or species habitat may occur within area	***Unlikely:*** A known record is located at Glenmorgan, to the far west of the project area. Not likely to occur.

Nature and extent of likely impact

Address any impacts on the members of any listened threatened species or any threatened ecological community, or their habitat.

Ecological communities

3D Environmental (2009) has undertaken field surveys to confirm if the identified threatened communities are present or likely to be present in the project area. Of the four communities, the only community likely to be within the project area is the brigalow (*Acacia harpophylla* dominant and codominant), which was identified within PL 198, PL 252 and PL 260. Figure 5 shows the distribution of the community within the project area.

The proposed location of the Theten IPF and Duntroon IPF is provided in Figure 6 and 7 with the mapped brigalow community. The Theten IPF site has a small non-remnant area on the eastern boundary and to the north on Theten Road. Duntroon IPF site does not have any remnants present. The Lynwood North option in Figure 8 shows there are two small fragments of the EPBC community present. All proposed development activities are located some distance from these sites.

As the extent of brigalow is highly fragmented, with small patches located within the area, the proposed options for infrastructure locations have been designed to avoid disturbance. Final site selection will be refined in consultation with a suitably qualified ecologist to ensure avoidance of all fragments.

Appendix 2 contains the 3D Environmental (2009) report which provides a detailed assessment of the likelihood of impacts from the project.

The proposed well areas and the pipeline connection to sales gas infrastructure and the EPBC communities are shown on Figure 9. The actual well site locations can be strategically placed around sensitive environmental areas and the pipeline right of way can also be reduced or shifted to avoid impacts. Due to the fragmented nature of the brigalow within the project area, it will be feasible to avoid these locations. Details of measures to avoid impacts are provided in Section 4.

Arrow intends to avoid clearing of EPBC Act listed vegetation, wherever possible, and minimise clearance wherever unavoidable. Therefore, direct impacts to the community are considered to be minimal. There is potential for indirect impacts such as an increase in weeds. However, proposed measures to avoid or reduce impacts (see Section 4) minimise the potential for significant impacts.

Birds

The only EPBC Act bird species likely to be present within the project area is the *Rostratula australis* (Australian painted snipe). This species prefers habitat within waterbodies and open mudflats. Suitable habitat is uncommon in the project area, and restricted to Lake Broadwater and possibly Long Swamp (both within PL 260). Impacts could result from removal of habitat, noise and light disturbances. The extent of impacts to the threatened bird species are expected to be minor, specifically as no habitat for this species within Lake Broadwater or Long Swamp will be disturbed.

Mammals

There are no mammals with the potential to occur within the project area.

Ray-finned fishes

The *Maccullochella peelii peelii* (Murray Cod) has the potential to occur within the Condamine River catchment. Potential impacts could occur from a decrease in water quality, elevated turbidity, restriction to fish movements or degradation of habitat. It is not proposed (as part of the project) to restrict the flow in the Condamine River or tributaries, so direct impacts to the species are not expected.

The proposed development of infrastructure for the Theten and Duntroon IPF will not be placed within watercourses. However, potential impacts could occur from decreases in water quality from construction of wells and associated infrastructure in close proximity to watercourses. Proposed measures to avoid or reduce impacts are provided in Section 4.

Reptiles

Two reptile species could potentially occur within the project area. These include the *Anomalopus mackayi* (five-clawed worm-skink), *Furina dunmalli* (Dunmall's snake) and the *Tympanocryptis pinguicolla* (Grassland earless dragon). These species may be impacted through the removal of important habitat to allow for field development and construction of infrastructure.

Dunmall's snake prefers habitat near waterbodies (such as Lake Broadwater). The five-clawed worm-skink and grassland earless dragon prefer 'derived grassland' habitat. Development of infrastructure for the Theten and Duntroon IPF will not occur within watercourses or near waterbodies. However, some field development is likely to occur within derived grassland habitat.

Plants

Nine plant species have the potential to occur within the project area. These are:

- *Acacia chinchillensis* (Chinchilla Wattle).
- *Bothriochloa biloba* (Lobed Blue Grass).
- *Dichanthium queenslandicum* (King blue-grass).
- *Digitaria porrecta* (Finger panic grass).
- *Homopholis belsonii.*
- *Philotheca sporadica.*
- *Picris evae* (Hawkweed).
- *Rhaponticum australe*
- *Thesium australe (*Austral toadflax).

The proposed action could have an impact on threatened plant species from direct clearance for infrastructure or field development or from indirect impacts such as weed infestations.

3.1 (e) Listed migratory species

Description

The EPBC Protected Matters search identified 19 migratory species as being potentially present within 5 km of the project area (Appendix 1). The list is based on the likelihood of occurrence according to distribution of species and their habitats. Table 4 shows the details from the EPBC Protected Matters search and the likelihood of occurrence at the project area using information from literature reviews. Field surveys of the project area were undertaken in October and November 2009, which targeted locating significant species and species habitat.

The bulk of these species are wetland/water species (e.g., waders, sea eagles, egrets) whose distribution within the local area is likely to be restricted or heavily influenced by Lake Broadwater and potentially Long Swamp. Rarely will the species inhabit other areas in the project area.

Table 4 Listed migratory species from EPBC Protected Matters search and the likelihood of occurrence

	Species	Status	Type of presence	Likelihood of occurrence
Migratory Terrestrial Species – Birds	*Haliaeetus leucogaster* White-bellied sea-eagle	Migratory	Species or species habitat likely to occur within area	***Likely:*** The project area contains potential habitat for this species.
	Hirundapus caudacutus White-throated needletail	Migratory	Species or species habitat may occur within area	***Present:*** This species was recorded within the project area during field surveys. Common and widespread.
	Merops ornatus Rainbow bee-eater	Migratory	Species or species habitat may occur within area	***Present:*** This species was recorded within the project area during field surveys. Common and widespread.
	Rhipidura rufifrons Rufous fantail	Migratory	Breeding may occur within area	***Present:*** This species was recorded within the project area during field surveys. The species prefers wet forests, of which there are none in the project area. Transient individuals are present rather than permanent populations.

	Xanthomyza phrygia Regent honeyeater	Migratory	Species or species habitat may occur within area	***Unlikely:*** The habitat for this species consists of dry eucalypt woodland and open forest, woodland, rural and urban areas with mature eucalypts; favours box-ironbark associations. The Regional Ecosystem mapping and field surveys indicate that there is limited habitat in the project area. Transient individuals from the south near Warwick have been recorded previously near the project area, however these are not permanent populations.
Migratory Wetland Species – Birds	*Ardea alba* Great egret, white egret (also the eastern great egret)	Migratory	Species or species habitat may occur within area	***Present*:** This species was recorded within the project area during field surveys. Present within nearby waterbodies in the project area.
	Ardea ibis Cattle egret	Migratory	Species or species habitat may occur within area	***Possible*:** The habitat within the project area may support the species. It could potentially be present within nearby waterbodies in the project area.
	Gallinago hardwickii Latham's snipe, Japanese snipe	Migratory	Species or species habitat known to occur within area	***Possible*:** This is a coastal species. It could potentially be present within nearby waterbodies in the project area.
	Nettapus coromandelianus albipennis Australian cotton pygmy-goose	Migratory	Species or species habitat may occur within area	***Possible*:** There are suitable freshwater waterbodies within the project area to support the species. There have previously been records in the general area.

	Limosa limosa Black-tailed godwit	Migratory	Species or species habitat known to occur within area	***Possible:*** There are suitable freshwater waterbodies within the area to support the species. There have previously been records in the general area.
	Nettapus coromandelianus albipennis Australian cotton pygmy-goose	Migratory	Species or species habitat may occur within area	***Possible:*** There is suitable habitat within the project area.
	Rostratula benghalensis s. lat. Painted snipe	Migratory	Species or species habitat may occur within area	***Possible:*** There is suitable habitat within the project area.
	Tringa glareola Wood sandpiper	Migratory	Species or species habitat known to occur within area	***Possible:*** There is suitable habitat within the project area.
	Tringa nebularia Common greenshank, greenshank	Migratory	Species or species habitat known to occur within area	***Possible:*** There is suitable habitat within the project area.
	Tringa stagnatilis Marsh sandpiper, little greenshank	Migratory	Species or species habitat known to occur within area	***Possible:*** There is suitable habitat within the project area.
Migratory Marine Birds	*Apus pacificus* Fork-tailed swift	Migratory	Species or species habitat may occur within area	***Possible:*** This species may migrate through the site to other areas of potential habitat.
	Ardea alba Great egret, white egret	Migratory	Species or species habitat may occur within area	***Possible:*** This is a coastal species. It could potentially be present within nearby waterbodies.
	Ardea ibis Cattle egret	Migratory	Species or species habitat may occur within area	***Possible:*** The habitat within the project area may support the species.

Nature and extent of likely impact

Address any impacts on the members of any listed migratory species, or their habitat.

Migratory Terrestrial Species - Birds
The project is unlikely to have a significant impact on threatened migratory terrestrial bird species, as many of these migrate through or fly over the area rather than inhabit the project area on a long term basis.

Migratory Wetland Species – Birds
Migratory wetland species may visit Lake Broadwater and Long Swamp. The proposed development will not impact on the waterbodies or their immediate surrounds, therefore significant impacts to these species are unlikely.

Migratory Marine Birds
These species may fly over the project area. Significant impacts from the project are unlikely.

3.1 (f) Commonwealth marine area
(If the action is in the Commonwealth marine area, complete 3.2(c) instead. This section is for actions taken outside the Commonwealth marine area, that may have impacts on that area.)

Description

None present.

Nature and extent of likely impact

Address any impacts on any part of the environment in the Commonwealth marine area.

3.1 (g) Commonwealth land
(If the action is on Commonwealth land, complete 3.2(d) instead. This section is for actions taken outside Commonwealth land, that may have impacts on that land.)

Description

If the action will affect Commonwealth land also describe the more general environment. The Policy Statement titled *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* provides further details on the type of information needed. If applicable, identify any potential impacts from actions taken outside the Australian jurisdiction on the environment in a Commonwealth Heritage Place overseas.

None present.

Nature and extent of likely impact

Address any impacts on any part of the environment in the Commonwealth land. Your assessment of impacts should refer to the *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* and specifically address impacts on:

- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and the social, economic and cultural aspects of the above things.

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, or actions taken on Commonwealth land

You must describe the nature and extent of likely impacts (both direct & indirect) on the whole environment if your project:

- is a nuclear action;
- will be taken by the Commonwealth or a Commonwealth agency;
- will be taken in a Commonwealth marine area; or
- will be taken on Commonwealth land.

Your assessment of impacts should refer to the *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* and specifically address impacts on:

- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and
- the social, economic and cultural aspects of the above things.

3.2 (a)	**Is the proposed action a nuclear action?**	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (b)	**Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?**	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (c)	**Is the proposed action to be taken in a Commonwealth marine area?**	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))

3.2 (d)	**Is the proposed action to be taken on Commonwealth land?**	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))

3.3 Other important features of the environment

Provide a description of the following features of the project area and the affected area, to the extent not otherwise addressed above.

3.3 (a) Soil and vegetation characteristics

Soils in the project area are dominated by heavy clays, which form rich agricultural soils. These are characterised by self-mulching, cracking clays with a deep profile. The richness of these soils resulted in clearance of the original dense woodland for agriculture. Agricultural practices include irrigation, cropping and cattle grazing. Many paddocks have been laser-levelled to achieve efficient flood irrigation. Soil erosion occurs within the disturbed clay soils, where suitable land management practices have not been adopted. In some areas, deep incised ephemeral channels have formed.

The project area falls within the Brigalow Belt bioregion. This bioregion is characterised by dense woodland and forest communities of Brigalow (*Acacia harpophylla*), with scattered ecosystems dominated by other species including eucalypt and cypress pine, grasslands and other acacia species. Expansive areas of land have been cleared in the region for agricultural purposes. Some tracts of remnant vegetation still exist as intact patches and isolated stands including along riparian systems associated with the Condamine river and tributaries. Figure 10 shows the distribution of Queensland Regional Ecosystems within the project area.

Other large tracts of vegetation include the vegetation within the Barakula State Forest north of Chinchilla (also used as a working forest), and the Braemar and Kumbarilla state forests bordering the project area, west and southwest of Dalby.

3.3 (b) Water flows, including rivers, creeks and impoundments

The Dalby Expansion Project lies within the sub-catchments of the Condamine River as listed below:

- Condamine River.
- Cooranga Creek.
- Braemar Creek.
- Back Creek.
- Jingi Jingi Creek.
- Jimbour Creek.
- Wilkie Creek.
- Moramby Creek.
- Clayhole Creek.
- Myall Creek.
- Oakey Creek.
- Crawlers Creek.
- Kurrawa Creek.
- Willis Creek.
- Ashall Creek.

The Condamine River and its major tributary, Wilkie Creek traverse the project area. Lake Broadwater and Long Swamp are also located within the project area.

Water quality data maintained by the Queensland Department of Environment and Resource Management (DERM) was available for Condamine River, Oakey Creek and Jimbour Creek in the vicinity of the Dalby Expansion Project. The data was reviewed in combination with field survey water quality results to determine the environmental values of the water.

The environmental values considered most appropriate for waters in the Dalby Expansion Project area are:

- Slightly-moderately disturbed waters (creeks and rivers were observed during the field survey to be affected by human activity due to land uses upstream of sites, although sites did not appear sufficiently degraded to consider them highly disturbed waters).

- Domestic water supply.
- Primary industry and agricultural land uses (dominant in the region).

Potential impacts to surface water from project activities have been assessed during preparation of the EM Plan, which is assessed by the Queensland Department of Environment and Resource Management.

3.3 (c) Outstanding natural features, including caves

No outstanding natural features.

3.3 (d) Gradient (or depth range if action to be taken in a marine area)

The gradient within the project area is variable.

3.3 (e) Buildings or other infrastructure

Various infrastructure is located on the existing PLs and PL(A)s, however none of these hold any significance historically.

Historical sites of significance within the region include the Dalby War Memorial and Memorial Park, which are located within the town of Dalby. Project activities will not impact on this feature.

3.3 (f) Marine areas

There are no marine areas within the vicinity of the project area.

3.3 (g) Kinds of fauna & flora

Significant tracts of fauna habitat occur around the western edges of the project area, southwest of Millmerran, and northeast of Miles. The pattern of habitat mirrors those areas recognised as being of bioregional significance and include wildlife corridors. A major wildlife corridor exists along the riparian margins of the Condamine River.

A total of 257 vascular flora species were recorded during the 2009 field survey including two ferns, two gymnosperms and 253 flowering plants. Preliminary mapping of habitat for significant species has been undertaken and is provided in Appendix 2.

A total of 132 vertebrate species were observed during the survey including one frog, 17 reptiles, 103 birds and 11 mammals. A list of species recorded during the survey is provided in Appendix 2.

3.3 (h) Current state of the environment in the area

Include information about the extent of erosion, whether the area is infested with weeds or feral animals and whether the area is covered by native vegetation or crops.

The project area is centred around the broad alluvial plain of the Condamine River and its associated tributaries. The productivity of the alluvial clay soils on the flood plain has resulted in heavy utilisation of these areas for agricultural purposes (predominantly tilled cropping) and remnant vegetation is largely restricted to narrow discontinuous strips along roadsides and drainage lines, or as isolated fragments on soils of less favourable physical properties. Continuous tracts of remnant vegetation associated with Braemar and Kumbarilla State Forests to the west intrude into the project area notably near PL 198 and the western edge of PL 230.

Four weeds declared under the Queensland *Land Protection (Pest and Stock Route Management) Act 2002*, were observed in the project area during field surveys. These were *Opuntia stricta* (prickly pear), *Opuntia tomentosa* (velvet pear), *Harrisia martini* (harrisia cactus) and *Bryophyllum delagoensis* (mother of millions).

Fifteen exotic vertebrate species are known to occur within the project area. Many of these pests (cane toad, house mouse, rock dove, common mynah) are abundant.

3.3 (i) Other important or unique values of the environment

Describe any other key features of the environment affected by, or in proximity to the proposed action (for example, any national parks, conservation reserves, wetlands of national significance etc).

The following parks and forests (see Figure 11) are located within the project area:

- Dalby State Forest within PL 194.
- Condamine Park (Karana) is located within PL(A) 260.
- Lake Broadwater Conservation Park within PL(A) 260 and PL 198. This site has been identified as possessing ecological values of state significance relating to special biodiversity values (wildlife refugia). The site is habitat for two rare flora species listed on the *Nature Conservation Act 1992,* and is listed as a 'Nationally Important Wetland' (Environment Australia, 2001).
- Braemar State Forest on the boundary of PL 230.

The following state forests are located outside of the project area:

- Daandine State Forest.
- Kumbarilla State Forest.
- Dunmore State Forest.
- Waar Waar State Forest.
- Western Creek State Forest.
- Wondul Range National Park.
- Bulli State Forest.

3.3 (j) Tenure of the action area (eg freehold, leasehold)

The land within the project area is predominantly freehold with some reserves (conservation reserve and National park).

3.3 (k) Existing land/marine uses of area

The Dalby Expansion Project area is surrounded by existing petroleum operations and exploration activities. Agricultural practices are also undertaken, which include irrigation, cropping and cattle grazing.

3.3 (l) Any proposed land/marine uses of area

The proposed use of the land is for gas field development and infrastructure, as detailed in Section 2.

4 Measures to avoid or reduce impacts

The Australian Government Environment Minister may decide that a proposed action is not likely to have significant impacts on a protected matter, as long as the action is taken in a particular manner (section 77A of the EPBC Act). The particular manner of taking the action may avoid or reduce certain impacts, in such a way that those impacts will not be 'significant'. More detail is provided in the *Guideline on Particular Manner Decisions under the EPBC Act* available at the Department's web site.

For the Minister to make such a decision (under section 77A), the proposed measures to avoid or reduce impacts must:

- clearly form part of the referred action (eg be identified in the referral and fall within the responsibility of the person proposing to take the action),
- be must be clear, unambiguous, and provide certainty in relation to reducing or avoiding impacts on the matters protected, and
- must be realistic and practical in terms of reporting, auditing and enforcement.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of habitat important, specific design measures, or adoption of specific work practices.

More general commitments (eg preparation of management plans or monitoring) and measures aimed at providing environmental offsets, compensation or off-site benefits CANNOT be taken into account in making the intial decision about whether the proposal is likely to have a significant impact on a matter protected under the EPBC Act. (But those commitments may be relevant at the later assessment and approval stages if your proposal proceeds to these stages.) Refer to the Guideline on Particular Manner Decisions under the EPBC Act available at the Department's web site.

For any measures intended to avoid or mitigate significant impacts on matters protected under the EPBC Act, specify:

- what the measure is,
- how the measure is expected to be effective, and
- the timeframe or workplan for the measure.

To ensure an understanding of EPBC Act listed communities and to provide accurate mapping, 3D Environmental (2009) undertook field surveys of the project area. Appendix 2 contains the report which provides a detailed assessment of the likelihood of impacts from the project.

Site Selection

Site selection has been the primary mitigation for avoiding and reducing impacts on EPBC Act listed threatened communities and species.

The project area contains many suitable development sites that avoid large remnants of native vegetation and therefore avoid adverse impacts to significant species. Infrastructure locations have been selected to avoid EPBC Act listed communities. Figures 6, 7 and 8 show the existing EPBC act listed communities and the proposed locations of infrastructure at the Theten IPF, Duntroon IPF and Lynwood North IPF sites.

Field development site selection is dependant upon the geological properties of the underlying strata, and ongoing collection of gas reservoir data. The proposed well site areas are shown in Figure 9. There are six key well development areas, each of which is proposed to contain approximately 50 wells. Most of these well site areas are in locations that have no EPBC Act listed communities mapped and very little native vegetation. There are however two well site areas in the north (PL 194) and south (PL 258) which fall within areas of remnant native vegetation.

Although the geology restricts the location of the wells to some extent, spacing between wells will ideally range from 700 m to 1000 m, hence there is scope to reposition proposed well sites to avoid sensitive areas at the surface. The maximum disturbance area for each new well site will be approximately 60 m by 70 m, this will be reduced to approximately 10 m by 10 m when the well is completed. Prompt rehabilitation after construction will also be undertaken.

The proposed high pressure gas pipeline connecting proposed facilities to sales gas infrastructure also falls within areas of remnant native vegetation and within the vicinity of mapped EPBC Act listed communities. The pipeline right of way width can be reduced or the alignment slightly shifted (where possible) to avoid such impacts.

The gas pipeline to sales infrastructure (Figure 9) alignment runs within close proximity to patches of brigalow in five locations. These locations are highlighted on the figure as locations 1 through to 5. Avoidance of these locations will be achievable by undertaking the measures discussed below:

- Location 1 – the alignment passes to the immediate east of a small patch of brigalow. The right of way will be reduced in width in this vicinity to avoid impacting on this area.
- Location 2 – the alignment passes to the immediate west of this small regrowth brigalow community. There is sufficient distance to avoid the patch at this location.
- Location 3 – the alignment passes to the immediate west of a small area of remnant brigalow. The right of way will be reduced in width in this vicinity to avoid impacting on this area.
- Location 4 – the alignment passes to the immediate east of a small patch of regrowth brigalow. There is sufficient distance to avoid the patch.
- Location 5 – the alignment passes within 80 m of a remnant patch of brigalow. A reduced width right of way and a 'no go' buffer zone will be established around this community to avoid adverse impacts.

Final site selection will be refined in consultation with a suitably qualified ecologist to ensure avoidance of all fragments.

Adherence to detailed site selection procedures and environmental management plans for construction and operation will ensure sensitive sites are protected and that appropriate measures are in place. Procedures will involve site selection criteria dependent upon the environmental conditions, and a set of minimum acceptable standards will be applied across all sites and facilities. Sites with moderate or high environmental constraints will have significantly higher environmental management requirements. This will be managed with a set of environmental management standard operating procedures (provided within the Appendices 3 – 7), to be held at an Arrow corporate level and implemented at sites. Accurate vegetation mapping over areas subject to immediate potential impact will be undertaken at a scale suitable for site specific planning prior to any development.

Once gas reserves within an area are proven viable, and a well site location (and gas and water gathering lines and access tracks) are finalised, the site will be assessed as to whether the location is ideal and has the lowest possible impact on the environment. The following aspects will be assessed and the site moved to a more suitable location if possible.

- Whether the site is within previous clearings or non-remnant vegetation or along existing easements.
- If the location has an adequate buffer distance to remnant vegetation or natural wetlands or watercourses (using the generic recommendations made the 'Regional Vegetation Management Code for Brigalow Belt and New England Tableland (DNR&W, 2006)). Specifically clearance will not occur within 100 m of any natural wetland (Long Swamp) within 200 m of any natural significant wetland (Lake Broadwater), other than clearing for pipelines and access tracks.
- Whether innovative solutions such as non-linear corridors (i.e. curves and bends around patches) can be used.
- Whether the track location can avoid the repeated isolating of small parcels of remnant vegetation from more continuous tracts.
- Whether methods to avoid high density well siting (e.g., horizontal drilling) can be used.

Once a location has been finalised, pre-construction/ pre-clearing surveys in habitats with potential for EPBC Act listed flora or fauna species within the vicinity of disturbance areas will be undertaken. The procedures for well site location are continually refined to ensure all environmental and social constraints are considered.

Additional Mitigation Measures

As detailed above, disturbance to populations of EPBC Act flora and fauna habitat will be avoided, by careful consideration to infrastructure site selection, field development and pipeline alignment. In addition to

avoidance measures, mitigation measures are also proposed to reduce potential indirect adverse impacts. Environmental management standard operating procedures (SOPs) have been developed which outline the environmental protection objectives, responsibilities and procedures to avoid and minimize impacts to the various aspects of the environment. The relevant SOPs for matters of national environmental significance are:

- SOP Vegetation and Habitat (Appendix 3)
- SOP Ground Disturbance and Erosion (Appendix 4)
- SOP Weed and Pathogen (Appendix 5)
- SOP Wildlife and Stock (Appendix 6)
- SOP Rehabilitation (Appendix 7)

Flora

Vegetation disturbance will be minimised wherever possible. Well gathering corridors will be as narrow as possible, particularly when crossing linear corridors of vegetation (e.g. Condamine, Wilkie Creek and some roadside reserves). Well sites will also be as small as possible (with consideration to safety measures). Unintended clearance will be avoided by:

- Using appropriate buffer zones.
- Ensuring all workers including contract plant and machinery operators are aware of the location of significant remnant vegetation and are guided by qualified personnel when clearing is undertaken.
- Marking all disturbance areas on the ground prior to clearing to ensure unnecessary or unintended impact is avoided.

Edge effects on native vegetation will be reduced by retaining woody debris, logs and rocks for rehabilitation and piling the items along the edge of the cleared corridor, where possible. This will also provide refugia for crossing fauna.

To reduce weed spread, all machinery involved in clearing vegetation and trench construction (including light vehicles) will be thoroughly washed prior to site access.

Fauna

Capture of terrestrial animals in open trenches poses a potential impact to both common and EPBC Act listed species. Several strategies will be used to avoid these impacts including:

- Minimising the time trenches are open. Laying and burying of pipes to occur as soon as possible after the trench has been created.
- Construction of exit points along the trench when it passes through or is within 1 km of native vegetation. Exit points will be created by digging a sloped ramp approximately 0.5-1 m wide from the bottom of the trench to the surface. Trapped animals (e.g. wallabies, bettongs) may use these to exit the trench.
- Trenches will be checked and trapped frogs, lizards, snakes, mammals (e.g.) and removed on a daily basis prior to laying pipes and closing trenches (i.e. shortly after sunrise). Captured animals will be relocated to nearby vegetation.
- Machinery operators will be advised to keep vigilant watch for any injured vertebrates (including snakes and lizards) resulting from clearing activities. Injured wildlife will then receive veterinarian treatment.
- Sediment controls and buffer zones will be implemented when working near watercourses to avoid or reduce impacts to water quality and fish.

5 Conclusion on the likelihood of significant impacts

Identify whether or not you believe the action is a controlled action (ie. whether you think that significant impacts on the matters protected under Part 3 of the EPBC Act are likely) and the reasons why.

5.1 Do you THINK your proposed action is a controlled action?

X	No, complete section 5.2
	Yes, complete section 5.3

5.2 Proposed action IS NOT a controlled action.

Specify the key reasons why you think the proposed action is NOT LIKELY to have significant adverse impacts on a matter protected under the EPBC Act.

The proposed action by Arrow to continue coal seam gas development in the Surat Basin by expansion of existing facilities and associated infrastructure will not have a significant impact on threatened communities and species listed under the EPBC Act because it will not:

- **Lead to a long-term decrease in the size of a population.** Proposed mitigation measures will avoid or minimise impacts on known EPBC Act listed species and habitat or listed species with the potential to occur in remnant vegetation. The proposed activities will not lead to a long-term decrease in population sizes of the identified species.
- **Fragment an existing population into two or more populations.** Although construction of coal seam gas production infrastructure and access tracks through remnant vegetation may result in segmenting intact stands, the extent of disturbance, limited by the application of stringent environmental controls, is unlikely to cause fragmentation of existing populations.
- **Adversely affect habitat critical to the survival of a species.** The extent of vegetation to be cleared to construct and operate the project will not adversely affect critical habitat for the survival of known species and species that might occur in the area. Site selection processes for field development will result in the avoidance or minimisation of unnecessary vegetation clearance.
- **Disrupt the breeding cycle of a known population.** The proposed activities will not affect any known nesting roosts or areas of species found or with the potential to occur in the project area. Water bodies will not be affected by the proposed development activities.
- **Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.** Some potential habitat (such as grassland) for both flora and fauna species will be affected by the proposed activities but not to the extent that the disturbance would significantly reduce the amount of remnant vegetation leading to a likely decline in its extent and quality or a decline in fauna abundance.
- **Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.** Weed management measures will ensure the introduction and spread of weeds is controlled.
- **Interfere with the recovery of a species.** The proposed site selection process and field development procedures, in addition to proposed mitigation measures will avoid or minimise impacts on listed threatened species and communities known or likely to occur in the project area and hence do not exacerbate the threatening processes.

5.3 Proposed action IS a controlled action

Type 'x' in the box for the matter(s) protected under the EPBC Act that you think are likely to be adversely impacted. (The 'sections' identified below are the relevant sections of the EPBC Act.)

	Matters likely to be impacted
	World Heritage values (sections 12 and 15A)
	National Heritage places (sections 15B and 15C)
	Wetlands of international importance (sections 16 and 17B)
	Listed threatened species and communities (sections 18 and 18A)
	Listed migratory species (sections 20 and 20A)
	Protection of the environment from nuclear actions (sections 21 and 22A)
	Commonwealth marine environment (sections 23 and 24A)
	Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)
	Protection of the environment from Commonwealth actions (section 28)
	Commonwealth Heritage places overseas (sections 27B and 27C)

Specify the key reasons why you think the proposed action is likely to have a significant adverse impact on the matters identified above.

6 Environmental history of the responsible party

NOTE: If a decision is made that a proposal needs approval under the EPBC Act, the Environment Minister will also decide the assessment approach. The EPBC Regulations provide for the environmental history of the party proposing to take the action to be taken into account when deciding the assessment approach.

		Yes	No
6.1	**Does the party taking the action have a satisfactory record of responsible environmental management?** **Provide details** Arrow Energy operates in a manner that protects and promotes the health and well-being of the environment. The company has maintained a clean environmental record since its foundation in 2000.	X	
6.2	**Has the party taking the action ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?** **If yes, provide details**		X
6.3	**If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?** **If yes, provide details of environmental policy and planning framework** Arrow Energy has an Integrated Environmental Management System, which promotes continual improvement of environmental performance. Audits and self-assessments are undertaken to ensure compliance with this system.	X	
6.4	**Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?**	X	

Provide name of proposal and EPBC reference number (if known)

Tipton Gas Field Gas Pipeline - A referral was submitted by Arrow Energy for a 145 km buried gas pipeline from the Tipton Gas Field to supply the town of Dalby, Oakley and Wambo in QLD. The referral reference is EPBC 2004/1797. The decision of the referral was a 'not controlled action' dated 19 October 2004.

Surat to Gladstone Pipeline – this proposed high pressure gas pipeline will transport gas from near Kogan North in the Surat Basin to Gladstone on the Queensland coast. To be constructed and operated by Surat Gladstone Pipeline Pty Ltd (a wholly-owned subsidiary of Arrow Energy). An EPBC Act referral (2009/5029) has been submitted for the project which was declared a controlled action on 15 October 2009. Assessment on preliminary information was nominated as the appropriate level of assessment for potential significant impacts on listed threatened species and communities (Sections 18 and 18A).

Surat Gas Project – Arrow Energy proposes to submit an EPBC Act referral for the Surat Gas Project concurrently with this referral for the Dalby Expansion Project.

7 Information sources and attachments

(For the information provided above)

7.1 References

- List the references used in preparing the referral.
- Highlight documents that are available to the public, including web references if relevant.

3D Environmental in association with Osmotic Ecology. 2009. Ecological values within areas under existing environmental authority application; Arrow Energy Surat Gas Project.

Department of the Environment, Water, Heritage and the Arts (DEWHA). 1999. Information Sheet on RAMSAR Wetlands – Narran Lake Nature Reserve 53.

Department of Natural Resources and Water (DNR&W). 2006. Regional Vegetation Management Code for Brigalow Belt and New England Tablelands Bioregion. Queensland Government, Brisbane.

Environment Australia (2001). *A Directory of Important Wetlands in Australia, Third Edition.* Environment Australia, Canberra.

WWF. 2008. Draft Queensland Brigalow Belt Reptile Recovery Plan 2007-2011. Report to the Department of the Environment and Heritage, Canberra. Australia.

7.2 Reliability and date of information

For information in section 3 specify:

- source of the information;
- how recent the information is;
- how the reliability of the information was tested; and
- any uncertainties in the information.

7.3 Attachments

Indicate the documents you have attached. All attachments must be less than two megabytes (2mb) so they can be published on the Department's website. Attachments larger than two megabytes (2mb) may delay the processing of your referral.

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	✓	Figure 1 – Dalby expansion project development areas.
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	Figure 2 – Current field development information. Figure 3 –Proposed additional field development. Figure 4 –Arrow Energy Surat Gas and Dalby Expansion Project areas. Figure 5 – EPBC Act listed ecological communities: Dalby Expansion Project. Figure 6 - EPBC Act listed ecological communities: Proposed Theten facilities. Figure 7 - EPBC Act listed ecological communities: Proposed Duntroon facilities. Figure 8 - EPBC Act listed ecological

			communities: Proposed Lynwood North (option) facilities. Figure 9 - EPBC Act listed ecological communities: Proposed connection pipeline and well areas. Figure 10 – Regional Ecosystems: Dalby Expansion Project. Figure 11 – Parks and Forests.
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.3)		
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.4)		
	copies of any flora and fauna investigations and surveys (section 3)	✓	Appendix 2
	technical reports relevant to the assessment of impacts on protected matters and that support the arguments and conclusions in the referral (section 3 and 4)	✓	Appendix 2 Appendix 3 Appendix 4 Appendix 5 Appendix 6 Appendix 7
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		

8 Contacts, signatures and declarations

NOTE: Providing false or misleading information is an offence punishable on conviction by imprisonment and fine (s 489, EPBC Act).

Under the EPBC Act a referral can only be made by:

- the person proposing to take the action (which can include a person acting on their behalf); or
- a Commonwealth, state or territory government, or agency that is aware of a proposal by a person to take an action, and that has administrative responsibilities relating to the action[1].

Project title:

8.1 Person proposing to take action

This is the individual, government agency or company that will be principally responsible for, or who will carry out, the proposed action.

If the proposed action will be taken under a contract or other arrangement, this is:

- the person for whose benefit the action will be taken; or
- the person who procured the contract or other arrangement and who will have principal control and responsibility for the taking of the proposed action.

The Minister may also request relevant additional information from this person.

If further assessment and approval for the action is required, any approval which may be granted will be issued to the person proposing to take the action. This person will be responsible for complying with any conditions attached to the approval.

If the Minister decides that further assessment and approval is required, the Minister must designate a person as a proponent of the action. The proponent is responsible for meeting the requirements of the EPBC Act during the assessment process. The proponent will generally be the person proposing to take the action[2].

Name	s. 47F(1)
Title	Environment Manager
Organisation	Arrow Energy
ACN / ABN (if applicable)	73 078 521 936
Postal address	Level 19, AM60 42-60 Albert Street Brisbane Qld 4000 AUSTRALIA
Telephone	s. 47F(1)
Email	s. 47F(1)@arrowenergy.com.au
Declaration	I declare that the information contained in this form is, to my knowledge, true and not misleading. I agree to be the proponent for this action.
Signature	Date

[1] *If the proposed action is to be taken by a Commonwealth, state or territory government or agency, section 8.1 of this form should be completed. However, if the government or agency is aware of, and has administrative responsibilities relating to, a proposed action that is to be taken by another person which has not otherwise been referred, please contact the Referrals Business Entry Point (1800 803 772) to obtain an alternative contacts, signatures and declarations page.*

[2] *If a person other than the person proposing to take action is to be nominated as the proponent, please contact the Referrals Business Entry Point (1800 803 772) to obtain an alternative contacts, signatures and declarations page.*

8.2 Person preparing the referral information (if different from 8.1)

Individual or organisation who has prepared the information contained in this referral form.

Name	s. 47F(1)
Title	Senior Consultant
Organisation	Coffey Natural Systems
Postal address	Level 21, 12 Creek Street Brisbane, QLD 4000
Telephone	s. 47F(1)
Email	s. 47F(1) @coffey.com

Declaration: I declare that the information contained in this form is, to my knowledge, true and not misleading.

Signature Date

If the referring party is a small business (fewer than 20 employees), estimate the time taken, in hours and minutes, to complete this form (include your time reading the instructions, working on the questions and obtaining the information and time spent by all employees in collecting and providing this information).

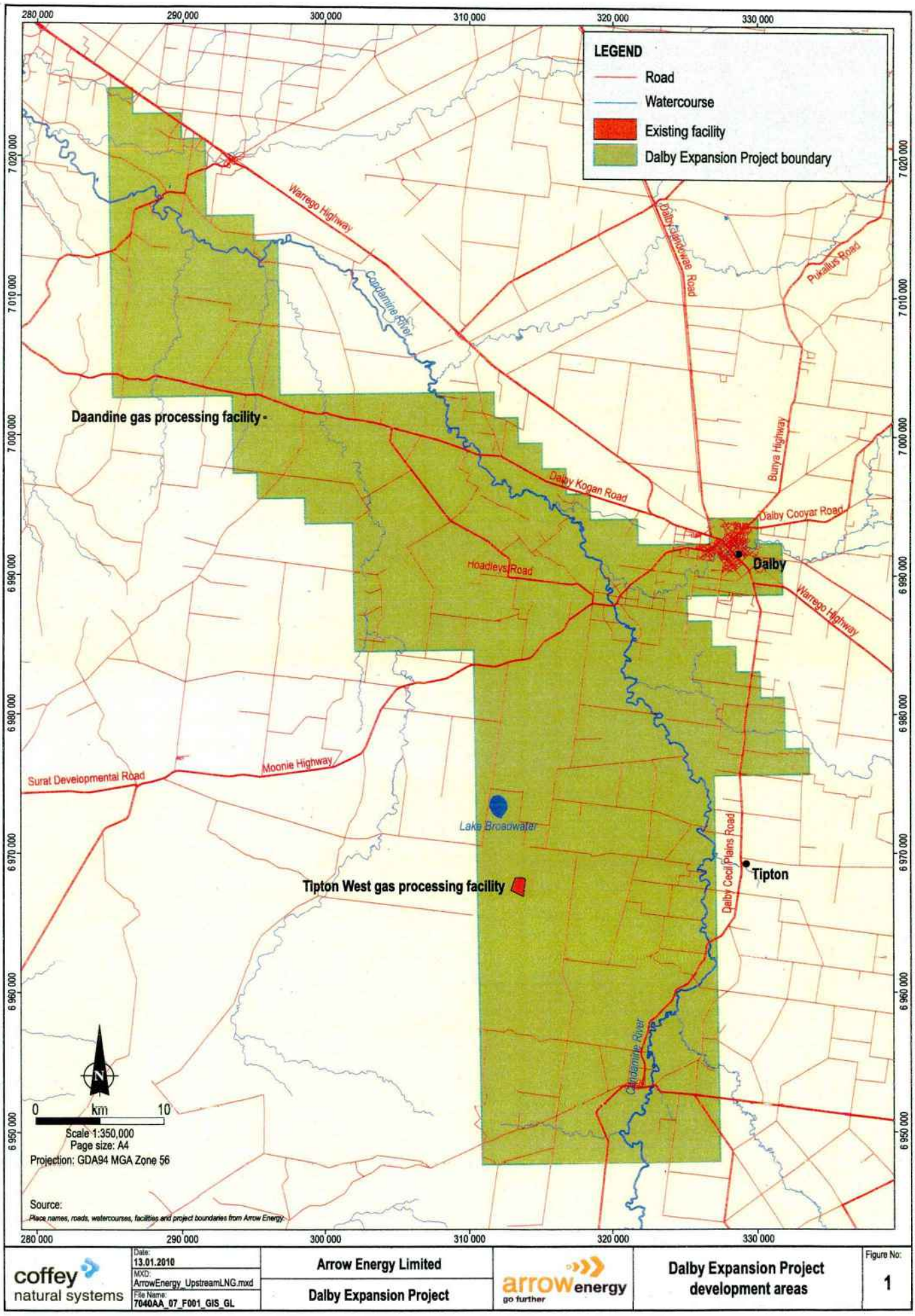
Hours	Minutes

REFERRAL CHECKLIST

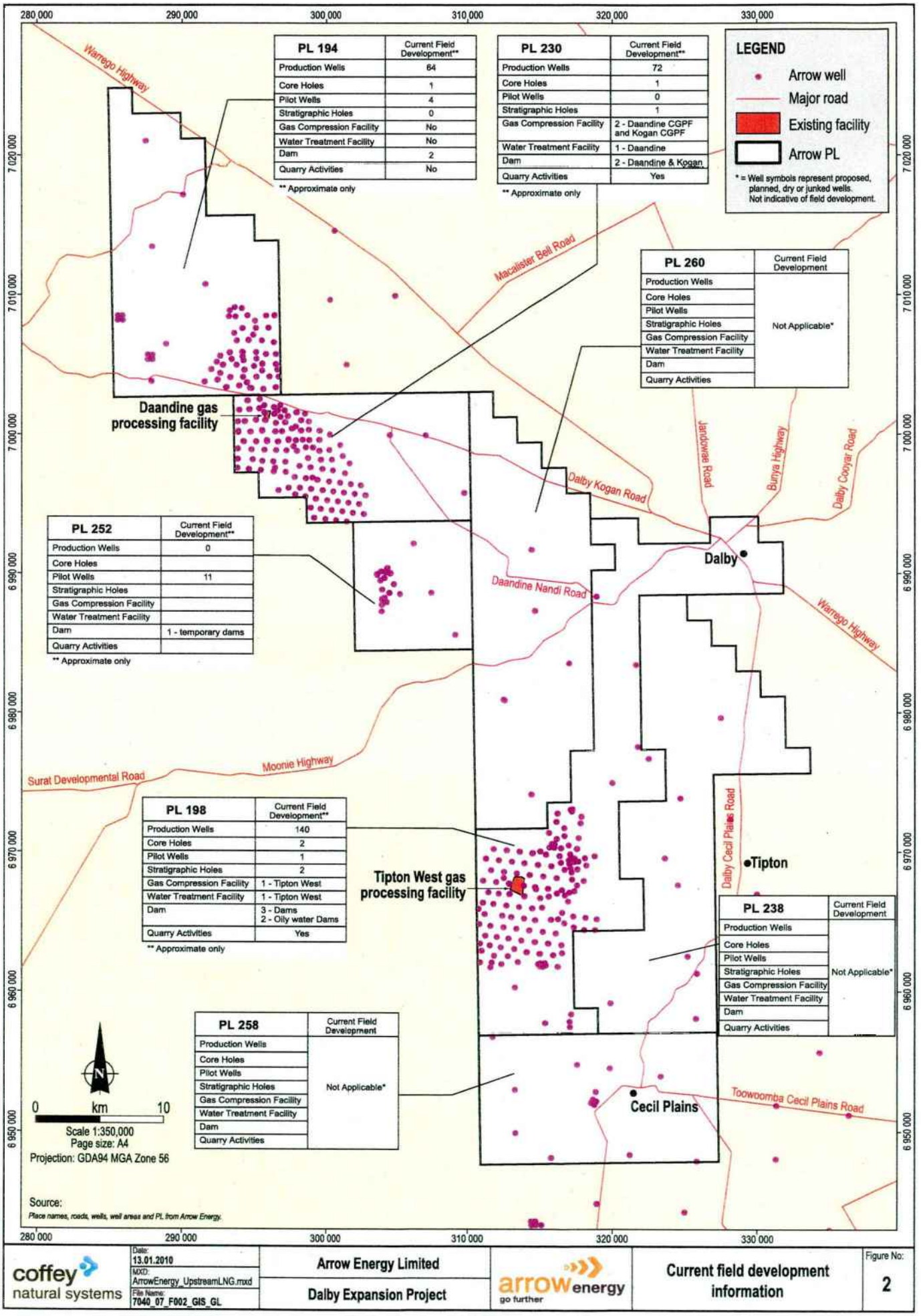
NOTE: This checklist is to help ensure that all the relevant referral information has been provided. It is not a part of the referral form and does not need to be sent to the Department.

HAVE YOU:

- ☐ Completed all required sections of the referral form?
- ☐ Included accurate coordinates (to allow the location of the proposed action to be mapped)?
- ☐ Provided a map showing the location and approximate boundaries of the project area?
- ☐ Provided a map/plan showing the location of the action in relation to any matters of NES?
- ☐ Provided complete contact details and signed the form?
- ☐ Provided copies of any documents referenced in the referral form?
- ☐ Ensured that all attachments are less than two megabytes (2mb)?
- ☐ Sent the referral to the Department (electronic and hard copy preferred)?



coffey natural systems	Date: 13.01.2010 MXD: ArrowEnergy_UpstreamLNG.mxd File Name: 7040AA_07_F001_GIS_GL	Arrow Energy Limited Dalby Expansion Project	arrow energy go further	Dalby Expansion Project development areas	Figure No: 1



PL 194	Current Field Development**
Production Wells	64
Core Holes	1
Pilot Wells	4
Stratigraphic Holes	0
Gas Compression Facility	No
Water Treatment Facility	No
Dam	2
Quarry Activities	No

** Approximate only

PL 230	Current Field Development**
Production Wells	72
Core Holes	1
Pilot Wells	0
Stratigraphic Holes	1
Gas Compression Facility	2 - Daandine CGPF and Kogan CGPF
Water Treatment Facility	1 - Daandine
Dam	2 - Daandine & Kogan
Quarry Activities	Yes

** Approximate only

PL 260	Current Field Development
Production Wells	Not Applicable*
Core Holes	
Pilot Wells	
Stratigraphic Holes	
Gas Compression Facility	
Water Treatment Facility	
Dam	
Quarry Activities	

PL 252	Current Field Development**
Production Wells	0
Core Holes	
Pilot Wells	11
Stratigraphic Holes	
Gas Compression Facility	
Water Treatment Facility	
Dam	1 - temporary dams
Quarry Activities	

** Approximate only

PL 198	Current Field Development**
Production Wells	140
Core Holes	2
Pilot Wells	1
Stratigraphic Holes	2
Gas Compression Facility	1 - Tipton West
Water Treatment Facility	1 - Tipton West
Dam	3 - Dams 2 - Oily water Dams
Quarry Activities	Yes

** Approximate only

PL 238	Current Field Development
Production Wells	Not Applicable*
Core Holes	
Pilot Wells	
Stratigraphic Holes	
Gas Compression Facility	
Water Treatment Facility	
Dam	
Quarry Activities	

PL 258	Current Field Development
Production Wells	Not Applicable*
Core Holes	
Pilot Wells	
Stratigraphic Holes	
Gas Compression Facility	
Water Treatment Facility	
Dam	
Quarry Activities	

coffey natural systems

Date: 13.01.2010
MXD: ArrowEnergy_UpstreamLNG.mxd
File Name: 7040_07_F002_GIS_GL

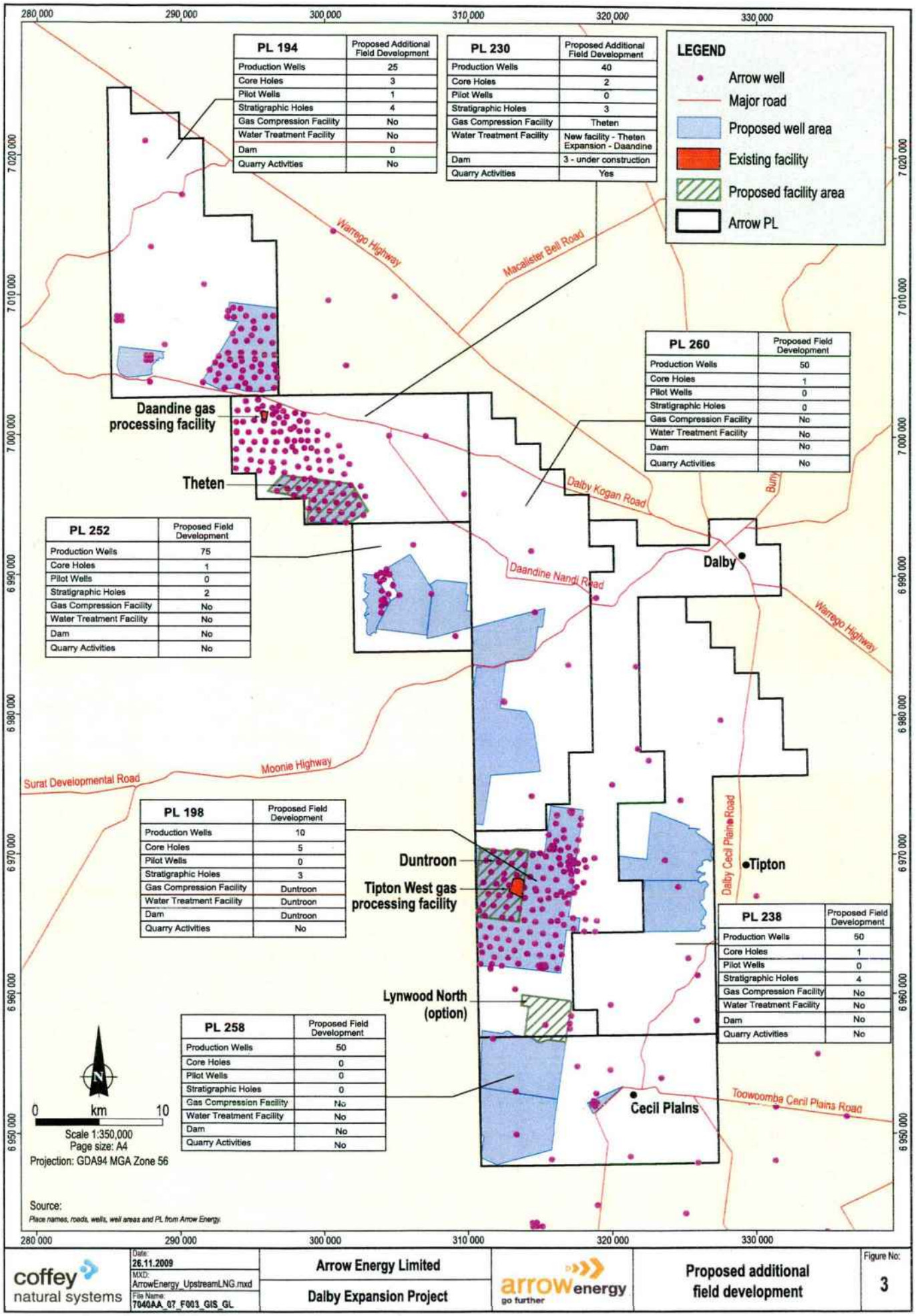
Arrow Energy Limited

Dalby Expansion Project

arrow energy go further

Current field development information

Figure No: 2



coffey natural systems	Date: 26.11.2009 MXD: ArrowEnergy_UpstreamLNG.mxd File Name: 7040AA_07_F003_GIS_GL	Arrow Energy Limited Dalby Expansion Project	arrow energy go further	Proposed additional field development	Figure No: 3

Australian Government

Department of the Environment, Water, Heritage and the Arts

FILE CREATION REQUEST FORM

Complete form electronically, then save as a new file to your H:\ drive and send as an email attachment to:
RecordsManagement.Helpdesk@environment.gov.au

1. Compete this section for **urgent** file requests

Date file required by (use for urgent requests dd/MM/yyyy):	Delivery options: Internal Mail

2a. Request options

New File ☒ or New File Part ☐ for file number	Select an appropriate File Type File Cover

2b. File amendments: choose one of the options below and **include** the file number of the file to be amended

Reclassify Security Level: file number → ☐	**Title Change**: file number → ☐

3. Related files (cross reference; **not including previous file parts**) Related:

4. Select an appropriate security classification from the list
5. Select an appropriate caveat from the list if required –
Unclassified files cannot have caveat

Unclassified
...

6. File Title: Supply a *suggested file title*, including descriptive information that will distinguish this file from other files that may document other aspects of the matter.
The *functional* and *activity keyword terms* are optional. The RMU will add these *terms* to the file title.

Function (Optional):	
Activity (Optional):	
Suggested File Title: (Maximum 220 characters)	*ARROW ENERGY/ENERGY GENERATION AND SUPPLY (NON-RENEWABLE)/SURAT BASIN/QLD/DALBY GAS EXPANSION PROJECT/EPBC 2010/5343*

7. Summary of file contents: a brief summary of the documents that are to be filed. ***Description (Maximum 200 characters):***
Assessment documentation
Note: For reports that are to be filed in a box, please click on the link and complete the form. Box File Attachment Form

8. Requesting Officer Details	**Division**	**Unit / Team / Section**	**Submission Date**
Name: James Barker Staff Registration No: Phone No:	APPROVALS AND WILDLIFE	Environment Assessment Mining Section	dd/MM/yyyy 02/02/2010

RECORDS MANAGEMENT UNIT USE ONLY

File Action: New or amended file number 2010/02842

File Title (if identical to the 'Suggested File Title' write 'As Above')
REGULATION - ASSESSMENT - ENVIRONMENTAL IMPACT (EI) - REFERRAL / ASSESSMENT / APPROVAL - ARROW ENERGY - ENERGY GENERATION AND SUPPLY (NON-RENEWABLE) - SURAT BASIN - QLD - DALBY GAS EXPANSION PROJECT - EPBC 2010/5343

Records Management Comments

TRIM Registration	**File Assembly**	**Quality Control Check**
s. 47F(1) 2/2/10	/ /	s. 47F(1) 3/2/10

Relevant Records Officer to initial and date each section above