



**Australian Government**

**Department of Sustainability, Environment, Water, Population and Communities**

## 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)
- Great Barrier Reef Marine Park (sections 24B and 24C)
- 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 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 or another law of the Commonwealth. Information is available on the Department's web site.

### **Is your action in the Great Barrier Reef Marine Park?**

If your action is in the Great Barrier Reef Marine Park it may require permission under the *Great Barrier Reef Marine Park Act 1975* (GBRMP Act). If permission is required, referral of the action under the EPBC Act is deemed to be an application under the GBRMP Act (see section 37AB, GBRMP Act). This referral will be forwarded to the Great Barrier Reef Marine Park Authority (the Authority) for the Authority to commence its permit processes as required under the Great Barrier Reef Marine Park Regulations 1983. If permission is not required under the GBRMP Act, no approval under the EPBC Act is required (see section 43, EPBC Act). The Authority can provide advice on relevant permission requirements applying to activities in the Marine Park.

The Authority is responsible for assessing applications for permissions under the GBRMP Act, GBRMP Regulations and Zoning Plan. Where assessment and approval is also required under the EPBC Act, a single integrated assessment for the purposes of both Acts will apply in most cases. Further information on environmental approval requirements applying to actions in the Great Barrier Reef Marine Park is available from <http://www.gbrmpa.gov.au/> or by contacting GBRMPA's Environmental Assessment and Management Section on (07) 4750 0700.

The Authority may require a permit application assessment fee to be paid in relation to the assessment of applications for permissions required under the GBRMP Act, even if the permission is made as a referral under the EPBC Act. Further information on this is available from the Authority:

Great Barrier Reef Marine Park Authority

2-68 Flinders Street PO Box 1379

Townsville QLD 4810

AUSTRALIA

Phone: + 61 7 4750 0700

Fax: + 61 7 4772 6093

[www.gbrmpa.gov.au](http://www.gbrmpa.gov.au)

### **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 Sustainability, Environment, Water, Population and Communities  
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](mailto: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 action can proceed if undertaken in a particular manner (subject to any other Commonwealth, state or local government requirements). 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. If your project is in the Great Barrier Reef Marine Park and a decision is made to approve it, the Authority may also audit it. (See "*Is your action in the Great Barrier Reef Marine Park*," p.2, for more details).

**For more information**

- call the Department of Sustainability, Environment, Water, Populations and Communities Community Information Unit on 1800 803 772 or
- visit the web site [www.environment.gov.au/epbc](http://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

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**Project title:** Arrow Bowen Pipeline

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## 1 Summary of proposed action

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1.1 **Short description**

The proposed action involves the construction of a 580 km long buried high pressure coal seam gas (CSG) pipeline of up to 42 inches (1,050 mm) in nominal diameter and consists of the Arrow Bowen (AB) mainline and three laterals, the Elphinstone Lateral (EL), Saraji Lateral (SL) and Dysart Lateral (DL). The project also includes above ground facilities, temporary workers' accommodation camps and temporary support facilities. The proposed pipeline route will require a 40 m Right of Way (ROW) to support construction activities, including clearing and grading, trenching and spoil placement, stringing, pipeline welding and laying.

The project will deliver CSG from Arrow Energy's gas fields in the Bowen Basin to a proposed Arrow Energy Gladstone Gas Hub (GGH) in the Aldoga precinct of the Gladstone State Development Area (GSDA) for further transmission to Arrow Energy's proposed Arrow LNG Plant on Curtis Island.

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1.2 Latitude and longitude

Location point (Kilometre Points)	Latitude			Longitude		
	degrees	minutes	seconds	degrees	Minutes	seconds
AB0	21	14	1.06	147	59	18.90
AB6	21	16	46.07	148	1	11.82
AB30	21	29	3.71	148	3	35.74
AB57	21	43	6.37	148	4	52.31
AB73	21	50	46.63	148	8	39.78
AB93	21	55	23.04	148	17	52.85
AB119	22	6	59.01	148	24	18.89
AB153	22	20	17.13	148	37	38.46
AB168	22	28	25.09	148	39	26.77
AB229	22	44	27.56	149	10	0.58
AB248	22	48	17.81	149	19	43.33
AB274	22	58	29.33	149	29	52.41
AB278	22	56	52.51	149	31	11.02
AB347	23	9	43.86	150	7	19.55
AB399	23	30	19.89	150	26	22.81
AB434	23	39	13.49	150	43	10.80
AB437	23	40	46.60	150	44	10.61
AB454	23	43	17.79	150	53	0.10
AB470	23	48	56.44	151	0	25.26
AB478	23	51	56.08	151	2	30.03
DL0	22	31	44.15	148	28	43.37
DL10	22	32	22.08	148	34	32.21
DL12	22	32	50.34	148	35	20.96
DL16	22	31	26.80	148	37	7.62
DL20	22	32	12.83	148	39	30.75
DL25.7	22	29	59.20	148	41	41.08
EL0	21	31	48.17	148	16	6.83
EL8	21	35	54.88	148	17	16.62
EL9	21	35	58.40	148	17	31.40
EL14	21	38	56.61	148	17	18.61
EL16	21	39	46.14	148	17	58.96
EL25	21	44	31.29	148	19	45.81
EL34	21	48	14.58	148	22	9.33
EL39	21	51	5.31	148	22	13.07
EL45	21	54	0.29	148	21	6.66
EL47	21	54	42.80	148	20	16.85
EL48	21	55	20.51	148	20	25.38
EL50	21	56	23.02	148	19	42.24
EL52	21	56	39.11	148	18	42.30
SL0	22	16	57.72	148	17	13.14
SL18	22	16	54.08	148	27	42.88
SL25.8	22	14	19.65	148	31	21.62

The project is described in accordance with kilometre points (KP) travelling north to south along the mainline and along the three laterals, as follows:

- For the Arrow Bowen (AB) mainline – AB is the prefix for kilometre point; AB0 indicating the most northern point and AB477 indicating the most southern point;
- For the Elphinstone Lateral (EL) – EL is the prefix for kilometre point; EL0 indicating the most northern point and EL52 indicating the most southern point where this lateral feeds into the AB mainline;
- For the Saraji Lateral (SL) – SL is the prefix for kilometre point; SL0 indicating the most western point and SL25.8 indicating the most eastern point where this lateral feeds into the AB mainline; and
- For the Dysart Lateral (DL) – DL is the prefix for kilometre point; DL0 indicating the most western point and DL25.7 indicating the most eastern point where this lateral feeds into the AB mainline.

1.3

**Locality and property description**

The AB mainline is approximately 477 km in length and will commence approximately 90 km north of Moranbah in Central Queensland and terminate at the proposed Arrow Energy GGH approximately 22 km west of Gladstone where it will join the Arrow Surat Pipeline (ASP), formerly known as the Surat Gladstone Project (SGP), for further transmission to the proposed Arrow LNG Plant on Curtis Island. The EL is approximately 52 km in length from 25 km southeast of Glenden to the AB mainline, 29 km east of Moranbah. The SL is approximately 26 km in length from 11 km east of the Peak Downs Mine to the AB mainline. The DL is approximately 26 km in length from 14 km northeast of Dysart to the AB mainline.

Main centres and smaller townships located within the vicinity of the proposed pipeline route include Glenden, Nebo, Moranbah, Dysart, Middlemount, Rockhampton, Marlborough, Bouldercombe, Duaringa, Bajool, Raglan, Gracemere, Mount Larcom and Calliope.

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

The proposed action requires a Right of Way (ROW) for pipeline construction activities with a width of 30 m for a distance of approximately 580 km and therefore affects an area of approximately 1,740 ha. A narrower construction width will be targeted for sensitive watercourse crossings and ecosystems such as areas of remnant vegetation. An additional 10 m wide temporary work space is required for pipe lay down, truck passing and turning circles, thus making a total ROW width of 40 m. These temporary work spaces are located outside sensitive remnant vegetation areas.

Five temporary workers' accommodation camps (with only two expected to be operational at any time) will be located in the vicinity of the proposed pipeline route at approximately 100 km intervals. The camps are expected to be located at Red Hill, Daunia, Hillcrest, Foresthorne and Bajool. The total expected footprint of each temporary workers' accommodation camp is approximately 25 ha, which equates to a total of 125 hectares (ha).

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1.5 **Street address of the site**

N/A

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1.6 **Lot description**

A ROW up to 40m width will be required to allow the construction of the gas pipeline. The operational easement for the proposed pipeline will be 30m wide and will extend the length of the pipeline. The proposed pipeline route traverses 232 lots and 90 easements as summarised below.

Freehold	205 lots
Land Lease	23 lots
Reserves	4 lots
<b>Total</b>	<b>232 lots</b>

The pipeline also crosses three Petroleum Leases (PL), nine Petroleum Pipeline Leases (PPL) and five Mining Leases (ML).

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

The proposed pipeline route traverses four local government areas (LGAs). It will commence in the southern part of the Whitsunday Regional Council LGA, traverse the Isaac and Rockhampton Regional Council's LGAs in a southerly direction and terminate in the Gladstone Regional Council LGA. The proposed pipeline route also traverses land included within two State Development Areas (SDAs), being the Stanwell-Gladstone Infrastructure Corridor (SGIC) SDA and the Gladstone SDA (GSDA).

Construction and operation of the pipeline pursuant to the *Petroleum and Gas (Production and Safety Act)* is exempt from approvals under Local Government Planning Schemes. Approval for temporary workers' accommodation camps will be sought separately to the EIS process under the Integrated Development Assessment System (IDAS) pursuant to the *Sustainable Planning Act 2009* (SP Act).

1.8 **Time frame**

It is envisaged that the project will be constructed over 15 months, beginning in April 2016 and spread over the 2016 and 2017 dry seasons. Circumstances such as adverse weather and potential collaboration with other pipeline construction projects in the region could extend the proposed construction period. Commercial operation of the project will commence in 2017/2018. The project will have a minimum technical design life of 40 years and with ongoing integrity management the potential operational life is expected to be in excess of this figure.

1.9	<b>Alternatives to proposed action</b> Were any feasible alternatives to taking the proposed action (including not taking the action) considered but are not proposed?		No
		X	Yes, you must also complete section 2.2
1.10	<b>Alternative time frames etc</b> Does the proposed action include alternative time frames, locations or activities?	X	No
			Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3.3 (where relevant).
1.11	<b>State assessment</b> Is the action subject to a state or territory environmental impact assessment?		No
		X	Yes, you must also complete Section 2.5 The Project will be assessed by Queensland Department of Environment and Heritage Protection (DEHP) pursuant to the Qld EP Act based on a voluntary EIS lodged by the proponent in December 2011.
1.12	<b>Component of larger action</b> Is the proposed action a component of a larger action?	X	No
			Yes, you must also complete Section 2.7
1.13	<b>Related actions/proposals</b> Is the proposed action related to other actions or proposals in the region (if known)?		No
		X	Yes, provide details: The Arrow Bowen Pipeline will link Arrow Energy's gas fields in the Bowen Basin to a proposed Arrow Energy gas gathering hub in the Aldoga precinct of the Gladstone State Development Area (GSDA) to Arrow Energy's proposed Arrow LNG Plant on Curtis Island. A separate EIS has been prepared for the proposed LNG Plant. A separate EIS for

		the upstream gas field development in the Bowen Basin is under development.
1.14	<b>Australian Government funding</b>	X
	Has the person proposing to take the action received any Australian Government grant funding to undertake this project?	No Yes, provide details:
1.15	<b>Great Barrier Reef Marine Park</b>	X
	Is the proposed action inside the Great Barrier Reef Marine Park?	No Yes, you must also complete Section 3.1 (h), 3.2 (e)

## **2 Detailed description of proposed action**

### **2.1 Description of proposed action**

Refer to Section 2.1 of the Arrow Bowen Pipeline Project, EPBC Referral – Supporting Documentation (Arrow Energy, 2012) report for a description of the proposed action.

### **2.2 Alternatives to taking the proposed action**

Refer to Section 2.2 of the Arrow Bowen Pipeline Project, EPBC Referral – Supporting Documentation (Arrow Energy, 2012) report for a description of the alternatives considered to taking the proposed action.

### **2.3 Alternative locations, time frames or activities that form part of the referred action**

The proposed action does not include alternative timeframes, locations or activities.

### **2.4 Context, planning framework and state/local government requirements**

Refer to Section 2.4 of the Arrow Bowen Pipeline Project, EPBC Referral – Supporting Documentation (Arrow Energy, 2012) report for the context, planning framework and state/local government requirements.

### **2.5 Environmental impact assessments under Commonwealth, state or territory legislation**

Refer to Section 2.5 of the Arrow Bowen Pipeline Project, EPBC Referral – Supporting Documentation (Arrow Energy, 2012) report for a description of the environmental impact assessment for the ABP in accordance with state legislation, the Environmental Protection Act 1994 (EP Act).

### **2.6 Public consultation (including with Indigenous stakeholders)**

Refer to Section 2.6 of the Arrow Bowen Pipeline Project, EPBC Referral – Supporting Documentation (Arrow Energy, 2012) report for details of public and Indigenous stakeholder consultation undertaken for the project. This section includes a description of the projects Stakeholder Consultation Plan (SCP) and a list of stakeholders identified for the project.

### **2.7 A staged development or component of a larger project**

Refer to Section 2.7 of the Arrow Bowen Pipeline Project, EPBC Referral – Supporting Documentation (Arrow Energy, 2012) report for details of how the ABP forms part of a larger project and links Arrow Energy's gas fields in the Bowen Basin to a GGH and onto Arrow Energy's LNG Plant on Curtis Island.

## 3 Description of environment & likely impacts

### 3.1 Matters of national environmental significance

#### 3.1 (a) World Heritage Properties

##### Description

There are no World Heritage places within or in the vicinity of the proposed pipeline route.

A search of the EPBC Act Protected Matters Search Tool found the Great Barrier Reef World Heritage Area to be within a 10km search area buffer of the proposed ROW.

##### Nature and extent of likely impact

The construction and operation of the project is unlikely to directly or indirectly affect any World Heritage properties, including the Great Barrier Reef World Heritage Area. This is due to the nature of the proposed action and distance the pipeline is located from the Great Barrier Reef World Heritage Area.

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#### 3.1 (b) National Heritage Places

##### Description

There are no National Heritage places within or in the vicinity of the proposed pipeline route.

A search of the EPBC Act Protected Matters Search Tool found the Great Barrier Reef to be within a 10km search area buffer of the proposed ROW.

##### Nature and extent of likely impact

The construction and operation of the project is unlikely to directly or indirectly affect any National Heritage places, including the Great Barrier Reef. This is due to the nature of the proposed action and distance the pipeline is located from the Great Barrier Reef.

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

#### Description

There are no Wetlands of International Importance (declared Ramsar wetlands) within, or in the vicinity of the proposed pipeline route. The nearest Ramsar wetland is the Shoalwater and Corio Basin area located 60 km northeast of the proposed pipeline route.

#### Nature and extent of likely impact

The nearest Ramsar Wetland is the Shoalwater and Corio Basin area located 60 km northeast of the proposed pipeline route. The wetland would not be directly or indirectly affected by the construction and operation of the project due to the distance from the proposed action.

### 3.1 (d) Listed threatened species and ecological communities

#### Description

A summary of the listed and ecological communities and threatened species potentially affected by the project is presented below. Detailed information is provided in Section 3.1(d) of the *Arrow Bowen Pipeline Project, EPBC Referral – Supporting Documentation* (Arrow Energy, 2012).

#### Nature and extent of likely impact

The impacts of the project on the listed threatened species and ecological communities potentially affected are detailed in Section 3.1(d) of the *Arrow Bowen Pipeline Project, EPBC Referral – Supporting Documentation* (Arrow Energy, 2012).

#### Endangered Ecological Communities

An EPBC protected matters search identified five Endangered Ecological Communities (EECs) that may occur within or adjacent to the ABP (**Table 1**). For each EEC, the EPBC nomination recommendation lists REs that are considered to form components of the EEC (DSEWPC, 2010b). **Table 3** describes EECs, REs included in the EEC and areas of those REs within the ROW and 5 km buffer. The ROW contains 45.58 ha of remnant REs that form components of EECs (approximately 0.15% of the area within the 5 km buffer).

**Table 1: Endangered Ecological Communities within the ROW and a 5km buffer**

EPBC Community Description	EPBC Act Status*	Equivalent RE	Area in ROW (ha)	Area in 5 km Buffer (ha)	% in Buffer <sup>^</sup>
Brigalow ( <i>Acacia harpophylla</i> dominant and co-dominant)	E	11.3.1	0	4044.62	0
		11.4.8	0.97	851.58	0.11
		11.4.9	0	2,069.69	0
		11.5.16	0	11.38	0
		11.9.1	0.11	537.77	0.02
		11.9.5	0	1,555.66	0
		11.11.14	0	602.06	0
		11.12.21	0	28.82	0

EPBC Community Description	EPBC Act Status*	Equivalent RE	Area in ROW (ha)	Area in 5 km Buffer (ha)	% in Buffer ^
Natural grasslands of the Qld Central Highlands and the northern Fitzroy Basin	E	11.3.21	0	770.52	0
		11.4.4	0	84.21	0
		11.8.11	7.36	5,397.11	0.14
		11.9.3	0	298.11	0
Semi-evergreen vine thickets of the Brigalow Belt	E	11.3.11	0	181.82	0
		11.4.1	0	6.67	0
		11.5.15	0	106.48	0
		11.8.13	0	571.93	0
		11.11.18	0.63	349.55	0.18
Weeping Myall Woodlands (only small component of RE)	E (where <i>A. pendula</i> dominates)	11.3.2	36.51	12,617.49	0.29
<b>Total</b>			<b>45.58</b>	<b>30,085.47</b>	<b>0.15</b>

Of the above, only Natural Grasslands (Blue Grass) have been recorded on the ROW. They were identified in two areas – AB35.01 to AB36.45 and AB36.79 to AB37.0. The pipeline route has been realigned to avoid Brigalow, Vine Thicket and the Weeping Myall Woodlands.

**Flora**

A search of the EPBC Act Protected Matters Search Tool database, Queensland Herbarium (QH) and Wildnet (W) identified 18 EPBC flora species likely to occur within the project area (**Table 2**).

**Table 2: Threatened flora species potentially occurring in the vicinity of the proposed pipeline route**

Scientific name	Common Name	Status*	Recorded within the route during field surveys	Source~
		EPBC		
<i>Bosistoa transversa</i> (syn. <i>B. selwynii</i> )	Three-leaved Bosistoa	V	-	EPBC
<i>Corymbia xanthope</i>	-	V	-	W
<i>Cossinia australiana</i>	-	E	-	EPBC
<i>Cupaniopsis shirleyana</i>	Wedge-leaf Tuckeroo	V	-	EPBC
<i>Cycas megacarpa</i>	-	E	-	QH, W
<i>Cycas ophiolitica</i>	Malborough Blue	E	-	EPBC
<i>Dichanthium queenslandicum</i>	King Blue Grass	V	-	QH, W
<i>Dichanthium setosum</i>	-	V	-	QH, W
<i>Digitaria porrecta</i>	Finger Panic Grass	E	-	EPBC
<i>Eucalyptus raveretiana</i>	Black Ironbox	V	Yes	QH, W

Scientific name	Common Name	Status*	Recorded within the route during field surveys	Source~
		EPBC		
<i>Graptophyllum ilicifolium</i>	Holly-leaved Graptophyllum, Mt Blackwood Holly	V	-	W
<i>Lepidium hyssopifolium</i>	Basalt Pepper Cress	E	-	W
<i>Leucopogon cuspidatus</i>	-	V	-	EPBC
<i>Ozothamnus eriocephalus</i>	-	V	-	QH, W
<i>Pimelea leptospermoides</i>	-	V	-	QH, W
<i>Pultenaea setulosa</i>	-	V	-	QH, W
<i>Quassia bidwillii</i>	-	V	-	EPBC
<i>Taeniophyllum muelleri</i>	Minute Orchid, Ribbon-root Orchid	V	-	EPBC

Note: E - Endangered, V - Vulnerable, NT - Not Threatened.

Of these 18 species, one species was recorded within the ROW during the field surveys. Essential habitat for *Eucalyptus raveretiana* (black ironbox), listed as Vulnerable under the EPBC Act, was recorded between KP 345 to 382.4 and at four watercourse crossings containing RE 11.3.25 (AB349.2 at Two Mile Creek, AB371.2 at Limestone Creek, AB373.4 at Deep Creek and AB382.8 at Lion Creek). Potential impacts have been mitigated through minor realignment to the creek crossings to avoid removal of these mature trees.

### Fauna

A desktop search of the Queensland Museum, Wildnet and EPBC databases identified 12 threatened fauna species potentially occurring within 20 km of the proposed pipeline route (**Table 3**).

Additionally, in April 2012, populations of Koala (*Phascolarctos cinereus*) within QLD and NSW were added to the vulnerable listing under the Act.

**Table 3: Threatened fauna species potentially occurring in the vicinity of the proposed pipeline route**

Class	Scientific name	Common name	Status*	Likelihood of occurrence within project area
			EPBC Act	
Birds	<i>Erythroriorchis radiatus</i>	Red Goshawk	V	Moderate. This species may overfly the project site on occasion.
Birds	<i>Geophaps scripta scripta</i>	Squatter Pigeon	V	Present. Recorded from multiple locations on the mainline and all laterals.
Birds	<i>Epthianura crocea macgregori</i>	Yellow Chat (Dawson)	CE	Present. This species has been recorded from approximately 1.5 km north of KP449, at Twelve Mile Creek.
Birds	<i>Turnix melanogaster</i>	Black-breasted Button-quail	V	Low. Preferred vine thicket habitat is absent from project site.
Mammals	<i>Dasyurus hallucatus</i>	Northern Quoll	E	Moderate. May occur in more extensive forested areas.
Mammals	<i>Pteropus poliocephalus</i>	Grey-Headed Flying-Fox	V	Present. Extensive areas of preferred habitat present.
Mammals	<i>Xeromys myoides</i>	Water mouse	V	Present. Recorded at a site several hundred metres east of the project site

Class	Scientific name	Common name	Status*	Likelihood of occurrence within project area
			EPBC Act	
Mammals	<i>Phascolarctos cinereus</i>	Koala	V	Moderate. May occur in more extensive Woodland and open forest areas.
Reptiles	<i>Rheodytes leukops</i>	Fitzroy River Turtle	V	Present. Some areas of preferred habitat present on major watercourses.
Reptiles	<i>Denisonia maculata</i>	Ornamental Snake	V	Present. Small areas of suitable habitat present, but species recorded regularly in project area.
Reptiles	<i>Furina dunmali</i>	Dunmall's Snake	V	Low. Very small number of records of this species in project area. Very scarce in northern limits of distribution, which occur in project area.
Reptiles	<i>Paradelma orientalis</i>	Brigalow Scaly-foot	V	High. Extensive areas of preferred habitat present.
Reptiles	<i>Egernia rugosa</i>	Yakka Skink	V	Moderate. May occur in more extensive forested areas.

Note: E - Endangered, V - Vulnerable, NT - Not Threatened. LC – Least Concern.

Of these 13 species, seven were identified within the vicinity of the proposed pipeline route during the field surveys, namely, the Squatter Pigeon (*Geophaps scripta scripta*), the Yellow Chat (*Epthianura crocea macgregori*), Grey-headed Flying Fox (*Pteropus poliocephalus*), Water Mouse (*Xeromys myoides*), Fitzroy River Turtle (*Rheodytes leukops*) and the Ornamental snake (*Denisonia maculate*) and Koala *Phascolarctos cinereus*.

### 3.1 (e) Listed migratory species

#### Description

A summary of the listed migratory species potentially affected by the project is provided below. A detailed description is provided in Section 3.1(E) of the the *Arrow Bowen Pipeline Project, EPBC Referral – Supporting Documentation* (Arrow Energy, 2012).

A search of the EPBC Act Protected Matters Search Tool identified the potential presence of 13 listed migratory bird species and one migratory reptile within a 10 km buffer of the proposed pipeline route. These species are listed in **Table 4** below.

**Table 4: Migratory species within 10km of the proposed pipeline**

Scientific Name	Common Name	Likelihood of occurrence
<i>Anseranas semipalmata</i>	Magpie Goose	High. Species utilises farm dams, rivers and ponds. Likely to be recorded.
<i>Apus pacificus</i>	Fork-tailed Swift	Moderate. Occurs at low density in the project area.
<i>Ardea alba</i>	Great Egret	Present.
<i>Ardea ibis</i>	Cattle Egret	Present.
<i>Gallinago hardwickii</i>	Latham's Snipe	Low. The preferred wetland habitats of this species are restricted in the project area.

Scientific Name	Common Name	Likelihood of occurrence
<i>Haliaeetus leucogaster</i>	White-bellied Sea Eagle	Present.
<i>Hirundapus caudacutus</i>	White-throated Needle-tail	High. Species utilises a variety of habitat types seasonally in the project area.
<i>Merops ornatus</i>	Rainbow Bee Eater	Present.
<i>Monarcha melanopsis</i>	Black-faced Monarch	Present. The species utilises a range of moist forest types and is likely to be recorded.
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	High. The species utilises a range of moist forest types and is likely to be recorded.
<i>Nettapus coromandelianus albipennis</i>	Cotton Pygmy Goose	Present.
<i>Rhipidura rufifrons</i>	Rufous Fantail	High. The species utilises a range of moist forest types and is likely to be recorded.
<i>Rostratula benghalensis</i>	Painted Snipe	Moderate. The preferred wetland habitats of this species are restricted in the project area
<i>Crocodylus porosus</i>	Estuarine Crocodile	Moderate. This species occurs at a low density in the Fitzroy Basin.

Six migratory species protected under the EPBC Act were recorded within the project area during the field surveys. These species include:

- Australian Cotton Pygmy Goose;
- Rainbow Bee-eater;
- Great Egret;
- Cattle Egret;
- White-bellied Sea Eagle; and
- Black-faced Monarch.

#### **Nature and extent of likely impact**

No migratory fauna species have been identified as being adversely affected by the project. This is further detailed in Section 3.1(e) of the *Arrow Bowen Pipeline Project, EPBC Referral – Supporting Documentation* (Arrow Energy, 2012).

#### **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**

There are no Commonwealth marine areas located within, or in the vicinity of the project.

#### **Nature and extent of likely impact**

The construction and operation of the project would not affect any Commonwealth marine areas.

#### **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.)

The action would not affect Commonwealth land.

**Description**

N/A

**Nature and extent of likely impact**

N/A

**3.1 (h) The Great Barrier Reef Marine Park**

**Description**

The Great Barrier Reef Marine Park is located within 10 km of the proposed pipeline route.

**Nature and extent of likely impact**

The Great Barrier Reef occurs within 10 km of the proposed pipeline route. Although proposed pipeline route runs through the Burdekin, Fitzroy and Calliope catchments which flow into the Great Barrier Reef lagoon, the construction and operation of the project is considered unlikely to affect the Great Barrier Reef.

Note: If your action occurs in the Great Barrier Reef Marine Park you may also require permission under the *Great Barrier Reef Marine Park Act 1975* (GBRMP Act). If so, section 37AB of the GBRMP Act provides that your referral under the EPBC Act is deemed to be an application under the GBRMP Act and Regulations for necessary permissions and a single integrated process will generally apply. Further information is available at [www.gbrmpa.gov.au](http://www.gbrmpa.gov.au)

**3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park**

3.2 (a)	Is the proposed action a nuclear action?	X	No
			Yes (provide details below)
<b>If yes, nature &amp; extent of likely impact on the whole environment</b>			
N/A			
3.2 ( )	Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?	X	No
			Yes (provide details below)
<b>If yes, nature &amp; extent of likely impact on the whole environment</b>			
N/A			
3.2 (c)	Is the proposed action to be taken in a Commonwealth marine area?	X	No
			Yes (provide details below)
<b>If yes, nature &amp; extent of likely impact on the whole environment (in addition to 3.1(f))</b>			
N/A			
3.2 (d)	Is the proposed action to be taken on Commonwealth land?	X	No
			Yes (provide details below)
<b>If yes, nature &amp; extent of likely impact on the whole environment (in addition to 3.1(g))</b>			
N/A			

3.2 (e)	Is the proposed action to be taken in the Great Barrier Reef Marine Park?	X	No
			Yes (provide details below)
If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))			
N/A			

### 3.3 Other important features of the environment

#### 3.3 (a) Flora and fauna

The proposed pipeline route is characterised by:

- Non-remnant vegetation (437.34 km or 74.7% of the proposed pipeline route), most of which is cropping and grazing land;
- High value regrowth (30.25 km or 5.2%); and
- Remnant vegetation (approximately 124 km or 21.4%) comprising the following Regional Ecosystems (REs):
  - Endangered<sup>1</sup> REs (0.44 km or 0.07% of the route);
  - Of Concern<sup>2</sup> REs (27.1 km or 4.6% of the route); and
  - No Concern at Present<sup>3</sup> REs (90.71 km or 15.5% of the route).

Assuming a 40 m wide ROW, the total disturbance area would be up to a maximum of 472.8 ha of remnant vegetation. This represents 0.33% of the remnant vegetation (of equivalent RE types) within the study area.

The most prominent vegetation types within the project area include poplar box woodland on residual Cainozoic sand plains (31.56 km) (RE 11.5.3) and ironbark woodland on fine-grained sedimentary rocks (19.26 km) (RE 11.9.9), both of which are classified as No Concern at Present.

Queensland Herbarium RE mapping recognises 78 REs within the study area. Field surveys and examination of satellite imagery identified 30 REs within the ROW. Based on Queensland Herbarium RE mapping, 3 REs with an Endangered Biodiversity Status, 10 REs with an Of Concern Biodiversity Status and 17 REs with a No Concern at Present Biodiversity Status are mapped as occurring within the ROW. Three REs with an Endangered Biodiversity Status, 10 REs with an Of Concern Biodiversity Status and 154 REs with a No Concern at Present Biodiversity Status were identified along the proposed pipeline route during the field surveys.

The ROW contains 120.99 ha of high value regrowth (HVR) vegetation, which represents approximately 0.32% of the area of HVR within a 5 km buffer. This includes 24.07 of HVR of Endangered RE, 38.90 ha of HVR of Of Concern RE and 58.03 ha of HVR of Least Concern RE.

<sup>1</sup> A regional ecosystem is listed as 'Endangered' under the *Vegetation Management Act 1999* if:

- remnant vegetation is less than 10 % of its pre-clearing extent across the bioregion; or 10-30% of its pre-clearing extent remains and the remnant vegetation is less than 10,000 hectares.

<sup>2</sup> A regional ecosystem is listed as 'Of concern' under *Vegetation Management Act 1999* if:

- remnant vegetation is 10-30 % of its pre-clearing extent across the bioregion; or more than 30 per cent of its pre-clearing extent remains and the remnant extent is less than 10,000 hectares.

<sup>3</sup> A regional ecosystem is listed as 'No concern at present / Least concern' under the *Vegetation Management Act 1999* if:

- remnant vegetation is over 30 % of its pre-clearing extent across the bioregion, and the remnant area is greater than 10,000 hectares.

A search of the Queensland Museum, Wildnet and EPBC databases identified 36 threatened fauna species which have been recorded within 20 km of the proposed pipeline route.

Essential habitat for one fauna species, Little Pied Bat (*Chalinolobus picatus*), is found within the ROW from AB74.7 to AB76.5. The ROW contains 6.25 ha of Essential Habitat for Little Pied Bat, which is listed as Near Threatened under the NC Act.

Field surveys have been conducted along the proposed alignment and were undertaken in winter and spring 2011 and in summer 2011. These surveys recorded:

- 17 amphibian species, none of which were threatened or near-threatened species.
- 31 reptile species, including the Endangered Grey Snake.
- 119 bird species including species of significance such as the Squatter Pigeon (Vulnerable under EPBC Act), Vulnerable Powerful Owl and Australian Cotton Pygmy Goose (Near-threatened under NC Act and migratory under EPBC Act).
- 43 mammal species including species of significance such as the Little Pied Bat (Near-Threatened under the NC Act) and Grey-headed Flying-Fox (Vulnerable under the EPBC Act).

The Estuarine Crocodile (*Crocodylus porosus*) (also known as saltwater crocodiles), listed as Vulnerable under the NC Act, may exist or have suitable habitat within the project area. The platypus (*Ornithorhynchus anatinus*) is listed as Least Concern under the NC Act and was observed during the field surveys.

### **3.3 (b) Hydrology, including water flows**

The proposed pipeline route traverses three river basins including the Burdekin, Fitzroy and Calliope River basins with the majority of the proposed pipeline route being contained within the Fitzroy Basin.

A total of 54 watercourse crossings were assessed along the proposed pipeline route of which 14 had a stream order of five or greater as assessed using the Strahler (1952) method for stream classification as listed below:

- Suttor Creek;
- Isaac River (four crossings);
- Blackburn Creek (two crossings);
- Clarke Creek;
- Apis Creek;
- Fitzroy River;
- Limestone Creek;
- Scrubby Creek;
- Inkerman Creek; and
- Raglan Creek.

The majority of watercourses within the project area are highly modified as a result of extensive clearing and existing land use practices, with water generally high in turbidity, metals, nutrients and pesticides.

### **3.3 (c) Soil characteristics**

Soil types were mapped and ground-truthed along the proposed pipeline route, according to the Australian Soil Classification and include:

- Vertosols - Shallow to deep dark clays and slightly gilgaied clays dark grey or dark brown cracking clays red friable earths;

- Sodosols - Sandy to loamy mottled duplex soils of shallow to moderate depth hard alkaline, neutral and acidic yellow soils (some with yellow mottling) hard acidic red soils and red friable earths deep sandy or loamy red earths;
- Chromosols - Loamy red duplex soils of shallow to moderate depth shallow mostly gravelly loamy duplex soils
- Rudosols - Shallow stony loams fairly shallow often stony loamy duplex soils. shallow stony clay loams;
- Kandosols - Deep dark clays sandy or loamy duplex soils with moderately deep A horizons;
- Hydrosols - Hard neutral yellow and yellow mottled soils.

The proposed pipeline route crosses land with high annual hillslope erosion yields (>10 t/ha/yr) which generally correspond to steeper hilly sections of the project area (e.g. Kerlong, Broadsound and Boomer Ranges) or Sodosol areas.

No acid sulphate soils (ASS) are mapped for the length of the proposed pipeline route (as per current maps published by the Queensland Government National Resources and Water, 2007). However, there may be some soils classed as having a high probability for presence of ASS or potential acid sulphate soils (PASS) in the low lying areas of Bajool - Port Alma area.

Good Quality Agricultural Land (GQAL) is land that is capable of sustainable use of agriculture, with a reasonable level of inputs, and without causing degradation of land or other natural resources. The majority of land traversed by the proposed pipeline route is Class C Good Quality Agricultural Land (GQAL) (86%). The remainder of land traversed by the proposed pipeline route comprises 10.4% Class A GQAL, 3.2% Class B GQAL and 0.2% of Class D GQAL.

The majority of the mainline pipeline route (61%) traverses land that has a medium potential for hillslope erosion. An estimate 16% of the land is highly erodible and 23% has a low erosion potential.

### **3.3 (d) Outstanding natural features**

The area is generally representative of the broader region which has been highly modified, primarily for grazing. No outstanding natural features have been identified along, or in the vicinity of, the proposed pipeline route to date.

### **3.3 (e) Remnant native vegetation**

The majority of the proposed pipeline passes through cleared land, primarily used for cropping and grazing. The alignment transects approximately 124 km of remnant vegetation and 28 km of HVR, which is less than 22% and 5% respectively, of the proposed pipeline alignment. Assuming a 30 m wide ROW, the total disturbance area would be approximately 372.1 ha of remnant vegetation. This represents 0.19% of the remnant vegetation (of equivalent RE types) within the study area.

### **3.3 (f) Gradient (or depth range if action is to be taken in a marine area)**

Elevation across the pipeline route generally decreases from the west to east, from a maximum elevation of appropriately 434 m Australian Height Datum (AHD) (AB26) at Mount Ewan to less than 5 m AHD at the Port Alma coastal plain, in the southeast section of the proposed pipeline route.

In general, the changes in height (slope) along the AB mainline are gentle (3% slope or less), with occasional steep slopes (7-15% slope) noted.

### **3.3 (g) Current state of the environment**

Land uses within the project area are predominantly for agricultural purposes (in particular cropping and grazing); residential dwellings; community buildings, infrastructure (including roads and railways); coal mines and conservation areas.

### **Weeds**

Field surveys recorded a number of declared weeds including Class 2 and Class 3 weeds, several of which are Weeds of National Significance (WONS), as identified in **Table 5**.

**Table 5: Weeds recorded during field surveys**

Scientific name	Common name	LP Act status*	National status~
<i>Asparagus aethiopicus</i>	Asparagus Fern	3	-
<i>Bryophyllum delagoense</i>	Mother of Millions	2	-
<i>Cryptostegia grandiflora</i>	Rubber Vine	2	WONS
<i>Harrisia martini</i>	Harrisia Cactus	2	-
<i>Lantana camara</i>	Lantana	3	WONS
<i>Lantana montevidensis</i>	Creeping Lantana	3	-
<i>Opuntia stricta</i>	Common Pest Pear	2	-
<i>Opuntia tomentosa</i>	Velvety Tree Pear	2	-
<i>Parkinsonia aculeata</i>	Parkinsonia	2	WONS
<i>Parthenium hysterophorus</i>	Parthenium Weed	2	WONS
<i>Sporobolus natalensis</i>	Giant Rat's Tail Grass	2	-
<i>Ziziphus mauritiana</i>	Indian jujube; Chinee Apple	2	-

### Introduced Species

Desktop searches identified 24 introduced fauna species within the project area, seven of which were recorded during the field surveys. These are listed in **Table 6**.

**Table 6: Introduced fauna recorded within the field surveys**

Class	Scientific name	Common name	LP Act status
Amphibians	<i>Rhinella marina</i>	Cane Toad	n/a
Birds	<i>Passer domesticus</i>	House Sparrow	n/a
Mammals	<i>Bos taurus</i>	European Cattle	n/a
Mammals	<i>Canis familiaris</i>	Dog	Class 2
Mammals	<i>Canis lupus dingo</i>	Dingo	Class 2
Mammals	<i>Felis catus</i>	Cat	Class 2
Mammals	<i>Sus scrofa</i>	Pig	Class 2

### 3.3 (h) Commonwealth Heritage Places or other places recognised as having heritage values

No places within 1km of the proposed pipeline route were identified from a review of Commonwealth heritage lists and registers.

### 3.3 (i) Indigenous heritage values

A search of the Indigenous Cultural Heritage Register and Database (ICHRD) returned 345 entries for Indigenous cultural heritage places and objects that have previously been recorded within a 5 km buffer either side of the proposed pipeline route. The distribution of places is predominantly north of the Moranbah area, which accounts for the majority of the current entries on the ICHRD. This area has seen the greatest number and scale of other development projects, including open cut coal mining. Intensive cultural heritage assessments have been undertaken in association with these projects from which a range of places and objects have been identified.

**3.3 (j) Other important or unique values of the environment**

The proposed pipeline route traverses eight conservation areas including four named state reserves, three unnamed reserves and Boveys Lookout. A formal search of the Queensland Heritage Register (QHR) identified three places within a 5 km buffer either side of the proposed pipeline route, with one place within 1 km. A search of the DERM Cultural Heritage Information Management System identified six additional places within a 5 km buffer either side of the proposed pipeline route. None of these are located within 1 km of the proposed pipeline route.

**3.3 (k) Tenure of the action area (e.g. freehold, leasehold)**

Land tenure along the preferred ROW comprises a total of 232 discrete land parcels, shown in **Table 7**.

**Table 7: Land tenure along the ROW**

Type of tenure	Lots / Land Parcels
Freehold	205
Land Lease	23
Reserves	4
<b>Total</b>	<b>232</b>

The ROW lies within 5 km of six State Forests and four Nature Refuges. No National Parks or World Heritage Areas occur within 5 km of the proposed pipeline route.

The propose pipeline alignment traverses conservation areas including four state reserves, three unnamed state reserves and Boveys Lookout.

**3.3 (l) Existing land/marine uses of area**

Land use associated with the broader regional area is predominantly for agricultural purposes (in particular cropping and grazing); residential dwellings; community buildings, infrastructure (including roads and railways); coal mines and conservation areas.

Existing land uses may be temporarily impacted by the construction of the project in terms of impacts from transport, air, noise and visual amenity. Impacts on existing land uses once the pipeline is operational will be minimal.

**3.3 (m) Any proposed land/marine uses of area**

The proposed pipeline is unlikely to impact on future land uses. The majority of the pipeline alignment is included within the rural land use class and the pipeline, once in operation, is not expected to have major impacts on agricultural activities.

The proposed pipeline route crosses a number of granted mining and petroleum tenements including Petroleum Leases, Petroleum Pipeline Licences and Mining Leases as well as a number of mining and petroleum tenements still within the application phase. Discussions with these tenement holders will ensure that the pipeline alignment does not sterilise valuable coal deposits. The alignment does not transect DERM's hard rock quarry operations and discussions are underway to ensure that expansion and future operations are not compromised.

## 4 Measures to avoid or reduce impacts

The proposed pipeline alignment has been developed with the aim of minimising the potential impacts on threatened EPBC listed flora and fauna species.

### Mitigation Measures for Fauna

The following management measures have been recommended to minimise the potential impact on fauna species as a result of the proposal:

- Topsoil (containing the natural seed bank) will be removed, stockpiled and then re-spread across rehabilitation areas as soon as possible following disturbance.
- Vegetation re-establishment should be monitored during and after construction.
- Clearing in watercourses, areas of Endangered and Of Concern vegetation and other sensitive areas should be carefully managed to minimise clearing of mature trees wherever possible.
- A pre-construction survey will be undertaken by an appropriately qualified ecologist to clearly identify and mark hollow-bearing trees or other ecologically sensitive areas.
- All fauna captured during the pre-clearing survey and spotter/catcher activities should be re-located.
- A suitably qualified and experienced fauna spotter/ handler will be present during vegetation clearing to minimise the potential harm to fauna species and recover any injured fauna.
- Ramps (with slopes of no greater than 50%) will be installed in the trench to allow the easy egress of fauna from the trench at a minimum of 1,000 m intervals. In areas of high fauna density, additional ramps and branches shall be installed to enable small fauna to exit the trench, while hessian sacks should be placed at approximately 250 m intervals for animal shelter.
- A qualified and experienced fauna spotted / handler should check the trench for captured fauna at least daily, preferably in the morning to remove animals prior to the heat of the day.

### Mitigation Measures for Flora

The proposed mitigation measures for flora include:

- Pre-construction surveys will be conducted in the ROW and immediate adjacent areas to mark EVNT and regionally significant flora species.
- Topsoil (containing the natural seed bank) will be removed, stockpiled and then re-spread across rehabilitation areas as soon as possible following disturbance.
- Vegetation re-establishment should be monitored during and after construction.
- Clearing in watercourses, areas of Endangered and Of Concern vegetation and other sensitive areas should be carefully managed to minimise clearing of mature trees wherever possible.
- If EVNT plants cannot be avoided, an appropriate management plan to offset biodiversity losses will be developed and implemented in liaison with relevant State and Commonwealth regulatory agencies.

### Mitigation Measures for Waterways

The following measures will be undertaken to minimise impacts to freshwater habitats and the biota (such as migratory birds) they support:

- Construction to occur primarily in the dry season.
- Flow diversion techniques will be used where flowing water is present during open cut crossings to minimise increase in turbidity.
- Water required during construction will be sourced from existing allocations.

- The crossings, including vehicular and maintenance tracks, will typically be at right angles to the direction of water flow to minimise scour potential.
  - If the watercourse contains a sandy substrate, consideration will be given to the use of rock stabilisation for addition to the channel and embankments to prevent scour.
  - Creek banks will be profiled and reinstated as near as practicable to their former profile following construction.
  - Where practicable, large riparian trees and rootstock will be retained for bank stabilisation.
  - Clearing widths should be minimised in the beds of watercourses.
  - Crossing sites selected to avoid where practical:
    - Unstable banks;
    - Deep pools;
    - Rock basements or rock outcrops in the channel;
    - Confluences with other channels.
  - Consideration will be given to seeding watercourse embankments with a fast-growing native grass (e.g. *Themeda australis*) or other suitable fast-growing species, or the use of hydro mulching (in the event of dry conditions) to aid in rehabilitation, where required.
  - Monitoring of the watercourses before, during and after construction shall be undertaken to ensure that rehabilitation works and stability of the watercourses is comparable to pre-construction conditions.
  - Pre-stripping and stockpiling of topsoil and bed material will be in accordance with the EMP.
  - The disturbance corridor for the bed, bank and approaches to watercourses will be the narrowest practicable for safe construction.
  - Training / induction of construction and maintenance crews will include environmental values associated with stream channels.
  - Where it is necessary to pump water around the watercourse crossing, the outlet water should not be directed onto the bank of the watercourse.
  - Minimum depth of cover of 1200 mm for watercourses.
  - Where an access track is required through a watercourse, this will generally be placed on the downstream side of the pipeline to minimise the potential for future erosion over the pipeline where practicable.
  - Watercourse crossings will be completed promptly and with due regard to the weather.
  - No refuelling of plant and equipment will be undertaken within 50 m of watercourses.
- Ongoing inspection of watercourses during operation, and remedial action is to be initiated where required.

Section 4 of the *Arrow Bowen Pipeline Project, EPBC Referral – Supporting Documentation* (Arrow Energy, 2012) identifies specific mitigation measures for minimising potential impacts on recorded species.

## 5 Conclusion on the likelihood of significant impacts

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

<input checked="" type="checkbox"/>	No, complete section 5.2
<input type="checkbox"/>	Yes, complete section 5.3

### 5.2 Proposed action IS NOT a controlled action.

The matters protected under the EPBC Act likely to be impacted by the construction and operation of the Arrow Bowen Pipeline have been identified as Listed threatened species and communities (sections 18 and 18A) and Listed migratory species (sections 20 and 20A).

With the implementation of mitigation methods to avoid or reduce impacts, as discussed in detail in Section 4 and Section 5 of the *Arrow Bowen Pipeline Project, EPBC Referral – Supporting Documentation* (Arrow Energy, 2012), the construction and operation of the ABP is not considered to have a significant impact on MNES and the proposed action is therefore not considered to be a controlled action.

### 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 significantly impacted. (The 'sections' identified below are the relevant sections of the EPBC Act.)

#### Matters likely to be impacted

<input type="checkbox"/>	World Heritage values (sections 12 and 15A)
<input type="checkbox"/>	National Heritage places (sections 15B and 15C)
<input type="checkbox"/>	Wetlands of international importance (sections 16 and 17B)
<input type="checkbox"/>	Listed threatened species and communities (sections 18 and 18A)
<input type="checkbox"/>	Listed migratory species (sections 20 and 20A)
<input type="checkbox"/>	Protection of the environment from nuclear actions (sections 21 and 22A)
<input type="checkbox"/>	Commonwealth marine environment (sections 23 and 24A)
<input type="checkbox"/>	Great Barrier Reef Marine Park (sections 24B and 24C)
<input type="checkbox"/>	Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)
<input type="checkbox"/>	Protection of the environment from Commonwealth actions (section 28)
<input type="checkbox"/>	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 record 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
<b>6.1</b>	<p><b>Does the party taking the action have a satisfactory record of responsible environmental management?</b></p> <p><b>Provide details</b></p> <p>Arrow Energy operates in a manner that protects and promotes the health and well-being of the environment.</p> <p>The company has maintained a clean environmental record since its foundation in 2000.</p>	X	
<b>6.2</b>	<p><b>Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - 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?</b></p> <p><b>If yes, provide details</b></p>		X
<b>6.3</b>	<p><b>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?</b></p> <p><b>If yes, provide details of environmental policy and planning framework</b></p> <p>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.</p>	X	
<b>6.4</b>	<p><b>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?</b></p>		

**Provide name of proposal and EPBC reference number (if known)**

X

2012. Bowen Gas Project – An EPBC referral was submitted on 9 May 2012 (2012/6377) with a determination of ‘controlled action’. The proposed project involves the development of coal seam gas production infrastructure in an area that extends from 30 km north of Glenden to 10 km south of Blackwater.

2010. Dalby Expansion Project – An EPBC referral was submitted on 2 February 2010 (2010/5343) with a determination of ‘not controlled action if undertaken in a particular manner’. The Dalby Expansion Project involves an expansion of existing gas field operations within the Tipton West, Daandine, Stratheden and Kogan North.

2010. Surat Gas Project – An EPBC referral was submitted on 2 February 2010 (2010/5344) with a determination of ‘controlled action’. The proposed 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.

2009. Surat to Gladstone Pipeline – An EPBC referral (2009/5029) was submitted on 7 August 2009 and the project was declared a controlled action on 15 October 2009. The project involves the construction of a high-pressure gas pipeline to 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).

2009. LNG Plant Project (formerly the Shell Australia LNG Project) - An EPBC Referral (2009/5007) was submitted in July 2009. This proposed LNG export facility on Curtis Island will have a base-case capacity of 16 million tonnes per annum (Mtpa), with a total plant capacity of up to 18 Mtpa. This project is a controlled action under the EPBC Act.

2005. Central Queensland Pipeline – An EPBC referral (2005/2059) was submitted on 30 March 2005 and the proposal was deemed a ‘controlled action’ on the 12 April 2005. The project involves the construction and operation of a high-pressure gas transmission pipeline of approximately 450 km in length from Moranbah to Gladstone.

2004. Tipton Gas Field Gas Pipeline – An EPBC referral (2004/1797) was submitted on 22 September 2004 and was deemed to be ‘not a controlled action’. The project related to a 145 km buried gas pipeline from the Tipton Gas Field to supply the town of Dalby, Oakley and Wambo in QLD.

## 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.

AECOM (2012). Environmental Assessment Report (Flora) for the Proposed Arrow Bowen Pipeline.

AECOM (2011). Flora and watercourse assessment for the proposed Arrow Bowen Pipeline (ABP).

APIA (2009) Australian Pipeline Industry Association Code of Environmental Practice – Onshore Pipelines, Canberra

DERM (2009). Queensland Wetland Mapping and Classification for the whole state, 2005 extent Version 2.0, Department of Environment and Resource Management, Queensland Government, Brisbane.

DERM. (2010). Wildnet Database. Department of Environment and Resource Management, Queensland Government, Brisbane.

DERM (2011) Biodiversity Status and Vegetation Management Class  
[www.derm.qld.gov.au/wildlife-ecosystems/biodiversity/regional\\_ecosystems/status.html](http://www.derm.qld.gov.au/wildlife-ecosystems/biodiversity/regional_ecosystems/status.html)

DSEWPC. (2010a). EPBC Act Protected Matters Search Tool. Department of Sustainability, Environment, Water, Population and Communities, Canberra. [www.environment.gov.au/erin/ert/epbc/index.html](http://www.environment.gov.au/erin/ert/epbc/index.html) accessed 11 October 2010

DSEWPC. (2010b). Species profile and threats database. Department of Sustainability, Environment, Water, Population and Communities, Canberra. <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>.

DSEWPC (2011). Farming and Nationally Protected Coolibah – Black Box Woodlands. Department of Sustainability, Environment, water, population and Communities, Australian Government.

Arrow Bowen Pipeline EIS, 2011, including the following supporting technical reports:

- Economic Assessment by Sinclair Knight Merz Pty Ltd;
- Social Impact Assessment by Sinclair Knight Merz Pty Ltd;
- Terrestrial Flora Assessment by AECOM Australia Pty Ltd;
- Terrestrial Fauna Assessment by Ecological Survey and Management Pty Ltd;
- Initial Site Safety Management Study by GHD Pty Ltd;
- Pipeline Route Selection Report by Coffey Environments Australia Pty Ltd;
- Traffic Impact Assessment by GHD Pty Ltd;
- Soils Assessment Report by Sinclair Knight Merz Pty Ltd;
- Water Crossing Information by AECOM Australia Pty Ltd;
- Aquatic Fauna Assessment by Sinclair Knight Merz Pty Ltd and Austral Consulting Pty Ltd;
- Flood Assessment by GHD Pty Ltd;
- Water Availability Study by GHD Pty Ltd;
- Cultural Heritage Impact Assessment by Central Queensland Cultural Heritage Management Pty Ltd;
- Historical Heritage Management Plan by Central Queensland Cultural Heritage Management Pty Ltd; and
- Independent technical reviews by OSD Pipelines Pty Ltd.

## 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.

The key source of information used in this referral was the Arrow Bowen Pipeline Environmental Impact Statement and supporting technical reports lodged with DERM in December 2011 in support of a decision on the Arrow Bowen Pipeline Project. The information presented in this referral is based on recent specialist field studies undertaken 14 June to 4 August 2011 (winter survey) and 29 August to 11 September 2011 (spring survey) and December 2012 (summer survey) and desktop research using a number of government databases (both in the public domain and under licence) and is considered current and reliable (subject to the caveats pertaining to them).

## 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)
<b>You must attach</b>		
figures, maps or aerial photographs showing the project locality (section 1)	✓	Figure 1-1 Project Overview (in supporting documentation)
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)		
<b>If relevant, attach</b>		
copies of any state or local government approvals and consent conditions (section 2.5)		
copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.6)	✓	ABP EIS <a href="http://www.arrowenergy.com.au">www.arrowenergy.com.au</a>
copies of any flora and fauna investigations and surveys (section 3)  <a href="http://www.arrowenergy.com.au/page/Community/Project_Assessment_EIS/Bowen_Pipeline">http://www.arrowenergy.com.au/page/Community/Project_Assessment_EIS/Bowen_Pipeline</a>	✓	AECOM (2012). <i>Environmental Assessment Report (Flora) for the Proposed Arrow-Bowen Gas Pipeline</i> . May, 2012. ECOSM (2011). <i>Arrow Bowen Pipeline Terrestrial Fauna Assessment</i> . October 2011.
technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral (section 3 and 4)	✓	EBPC Referral Supporting Information Report
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<sup>4</sup>.

**Project title:** Arrow Bowen Pipeline

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### 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.

If the proposed action requires a permit under the Great Barrier Reef Marine Park Act<sup>5</sup>, this is the person requiring the grant of a GBRMP permission.

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<sup>6</sup>.

Name	Paul Neilson
Title	EIS Manager
Organisation	Arrow Energy Pty Ltd
ACN / ABN (if applicable)	73 078 521 936
Postal address	GPO Box 5262 Brisbane QLD 4001
Telephone	07 3012 4000
Email	pneilson@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	5/7/12

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<sup>4</sup> 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.

<sup>5</sup> If your referred action, or a component of it, is to be taken in the Great Barrier Reef Marine Park the Minister is required to provide a copy of your referral to the Great Barrier Reef Marine Park Authority (GBRMPA) (see section 73A, EPBC Act). For information about how the GBRMPA may use your information, see [http://www.gbrmpa.gov.au/privacy/privacy\\_notice\\_for\\_permits](http://www.gbrmpa.gov.au/privacy/privacy_notice_for_permits).

<sup>6</sup> 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	Greg Lee-Manwar
Title	Approvals Manager – Major Pipelines
Organisation	Arrow Energy Pty Ltd
ACN / ABN (if applicable)	73 078 521 936
Postal address	GPO Box 5262 Brisbane QLD 4001
Telephone	07 3012 4000
Email	gleemanwar@arrowenergy.com.au
Declaration	I declare that the information contained in this form is, to my knowledge, true and not misleading.
Signature	 Date 5/7/12

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