SURAT GAS PROJECT EPBC ACT REFERRAL

Arrow Energy

January 2010





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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: Surat Gas 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) 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							
Latitude	longitude Latitude and	location point	Latitude			Longitude		
	longitude details are used to accurately		degrees	minutes	second	degrees	minutes	seconds
	map the boundary	1	27	39	54.34	151	25	3.93
	of the proposed	2	27	39	54.34	151	20	3.93
	action. If these	3	27	44	54.34	151	20	3.93
	coordinates are	4	27	44	54.34	151	15	3.94
	inaccurate or	5	28	4	54.33	151	15	3.95
	insufficient it may	6	28	4	54.33	151	10	3.95
	delay the processing	7	28	9	54.33	151	10	3.95
	of your referral.	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

19

3.91

3.91

55

55

150

150

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
					2	
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

ī						
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		15	10.44
				150		
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		20	38.31			
	26			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		20	9.77
				150		
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
		22				
113	26		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
	26	23	23.65		21	
128				150		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	8.0	150	23	40.95
148	26	25	1.17	150	23	43.95
140	20	20	1.17	130	23	43.93

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 km². 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.

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	Х	No
_	action include alternative timeframes, locations or activities?		Yes, you must also complete section 2.2
1.10	State assessment Is the action subject		No
_	to a state or territory environmental impact assessment?	X	Yes, you must also complete Section 2.4
1.11	Component of	Χ	No
	larger action Is the proposed action a component of a larger action?		Yes, you must also complete Section 2.6
1.12	Related		No
	actions/proposals Is the proposed action related to	Χ	Yes, provide details:
other actions or proposals in the region (if known)?			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?

No

Χ

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). 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.

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 (<i>Acacia</i> 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.

	1	1	1	
	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 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* (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 \underline{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.

		No
Thuse making 9 output of likely impact on		Yes (provide details below)
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Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?		No
		Yes (provide details below)
If yes, nature & extent of likely impact on	the who	ole environment
	the who	
If yes, nature & extent of likely impact on Is the proposed action to be taken in a Commonwealth marine area?		No
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is the proposed action to be taken in a Commonwealth marine area?	X	No Yes (provide details below)
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is the proposed action to be taken in a Commonwealth marine area?	X	No Yes (provide details below)
is the proposed action to be taken in a Commonwealth marine area?	X	No Yes (provide details below)
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(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 (I) 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 km², 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.

Current and proposed exploration activities are not part of the 'proposed action' within this referral. Exploration activities are not likely to have a significant impact on matters of national environmental significance, as they have and can be sited to avoid listed threatened species and communities and listed migratory birds habitat.

6 Environmental history of the responsible partyNOTE: 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?	Х	
	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.		
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?		Х
	If yes, provide details		
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?	Х	
	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.		
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 action¹.

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 action².

Name Carolyn Collins

Title Environment Manager

Organisation Arrow Energy

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710011011171

Telephone 07 3012 4000

Email ccollins@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 July blc

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

Jayne Rutter

Title

Senior Consultant

Organisation

Coffey Natural Systems

Postal address

Level 21, 12 Creek Street Brisbane, QLD 4000

Telephone

(07) 3002 4000

Email

jayne_rutter@coffey.com

Declaration

I declare that the information contained in this form is, to my knowledge, true and not

misleading.

Signature

Mutter

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