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LAND USE AND TENURE

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SUPPLEMENTARY REPORT TO THE EIS

Section 13 Land Use and Tenure

13 Land Use and Tenure

This chapter has been developed to supplement the Land Use and Tenure chapter (Section 19) of the EIS, which identified the land tenure and land use values within and surrounding the Project area. Furthermore, it provided an assessment of the potential for these values to be affected by direct and indirect impacts associated with the construction, operations and decommissioning phases of the Project.

This chapter identifies land use impacts that may result from the revised project description and provides additional mitigation or management measures that may be required to ameliorate the revised potential impacts.

13.1 Legislative Context

A full description of the legislative framework and statutory controls applicable to the Project was provided in the EIS (Land Use and Tenure chapter (Section 19) and Land Use and Tenure Technical Report (Appendix Q)). However, since the release of the EIS there have been numerous legislative changes at the Commonwealth and State levels which have implications for the Project. The release of the Central Queensland Regional Plan in October 2013 is one such example. The Project Approvals chapter (Section 2) of the SREIS provides an updated and current description of the statutory framework applicable to the Project as it currently stands.

While there are some areas of overlap between the identification and protection of 'land uses' from a statutory and administrative perspective, the impact assessment contained in this chapter is solely related to the land use values of the Project area, the relevant impacts and the implications of changes to the Project since the release of the EIS.

13.2 Summary Existing Land Use and Tenure Environmental Values

From a baseline identification perspective, there have been minimal changes to the land use and tenure environmental values of the Project area since the release of the EIS. The continuation of the current existing land uses such as agricultural and resource enterprises and urban and residential development, have not resulted in any significant material changes in the Project area.

13.2.1 Land Use

The Project area covers an area of approximately 8,000 km² in the Bowen Basin, extending from Glenden in the north to just south of Blackwater. The topography of the Project area is best described as gently undulating with elevated areas and escarpments bordering the wider region. The regional geology can be generally described as comprising fine grained sedimentary rocks, intersected by

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quaternary alluvium systems associated with creek and river flats, floodplains and alluvial plains of the Isaac and Mackenzie River sub-catchments of the Fitzroy River Catchment and the Suttor and Bowen River sub-catchments of the Burdekin River Catchment.

Much of the Project area supports low density, low intensity grazing and agricultural activity. However, areas of rain-fed and dryland cropping exist within specific locations in the Project area. Extensive clearing for grazing and agricultural purposes has resulted in remnant vegetation largely being confined to the riparian zone, predominantly along drainage lines and unallocated state land where outside of protected areas.

Homesteads are located over large pastoral allotments within the Project area and typified by lease hold tenure. The subdivision pattern of these allotments is influenced by the topographical features and is often a remaining feature of historical surveying. Allotments that support horticultural type land uses are often smaller in nature and found along the fertile alluvial floodplains of the Isaac and Mackenzie Rivers. These allotments are characterised by more regular configurations and are not fixed to topographical features, such as ridgelines and rivers.

The predominant land uses within the Project area are agricultural, with pastoral areas (cattle grazing) comprising approximately 722,306 ha of the Project area (90.2%) and horticulture (irrigated and dry land cropping) comprising approximately 22,347 ha of the Project area (2.7%).

For the purposes of identifying the baseline characteristics of the Project area, the areas were reported under the land use and infrastructure themes of:

- Land uses:
 - Agriculture;
 - Urban development;
 - Mining and resources; and
 - Conservation, tourism and recreation.
- Infrastructure including:
 - Roads;
 - Rail;
 - Stock routes; and
 - Utilities and other services.

Additional details regarding the baseline land use values of the Project area can be found in the Land Use and Tenure chapter (Section 19) and Land Use and Tenure Technical Report (Appendix Q) of the EIS.

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13.2.2 Land Tenure

Table 13-1 identifies the land tenure characteristics of the Project area.

Table 13-1 Land Use Characteristics of the Project Area

Land Tenure Type	Freehold	Leasehold	State Held Tenure	Protected Estate
Allotments and % of Project area	2,146 allotments (approximately 62.33% of the Project area)	798 allotments (approximately 35.31% of the Project area)	84 Reserves (State Forests, Timber Reserves, and Forest Reserves) and 53 allotments of Unallocated State Land (approximately 1.13% of the Project area)	Eight areas of protected estate are located either in whole or in part in the Project area (approximately 1.23% of the Project area)

13.3 Summary of Existing Land Use Impacts from the EIS

Generalised impacts to the land use characteristics and values of the Project area will remain largely unchanged, as summarised below and detailed in full in the Land Use and Tenure Technical Report (Appendix Q) of the EIS. However, there are a number of changes to the project description, as detailed in Section 13.4, which will reduce the magnitude of impacts on certain agricultural enterprises, urban and residential areas, mining and resource operations, areas of conservation tourism and recreation, and certain local infrastructure.

13.3.1 Agriculture

Impacts to agricultural enterprises in the Project area will remain largely unchanged, and as discussed in Section 13.4, the material impacts across the Project area will decrease in magnitude on certain agricultural land holdings and the associated impacts on the agricultural enterprise. Existing impacts to agriculture which are still applicable to the Project are summarised below:

- Potential changes to soil profiles;
- Potential changes to mechanised farming practices;
- Potential disruptions to farm workability;
- Potential changes to on farm management practices resulting in higher overheads;
- Potential reduction in on-farm amenity;
- Potentially contaminating activities sterilising certain lands; and
- Potential disturbance to protected agricultural land uses (Good Quality Agricultural Land, Strategic Cropping Land and Priority Agricultural Land Uses).

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13.3.2 Urban and Residential Development

Existing impacts to urban and residential land uses are mostly to do with reductions in amenity, which includes noise, vibration, air quality and visual effects both during construction and operation. Similar to the impacts on agricultural enterprises, the magnitude of impact has changed on certain urban and residential land uses in line with the changes to the project description as detailed further in Section 13.4.

13.3.3 Mining and Resources

While there is potential for conflicts between mineral resource tenement holders and associated operations, Arrow is committed to working with mining companies, to ensure that the value of the underlying gas and coal resources are maximised. Identified conflicts since the release of the EIS have been addressed in the Submission Responses chapter (Section 21) of the SREIS.

13.3.4 Conservation, Tourism and Recreation

As stated in the EIS, no Project infrastructure is proposed within any areas of Category A or Category B environmentally sensitive areas. However, Project infrastructure may be located within Category C environmentally sensitive areas. Where Project activities are proposed to occur in areas of open space that exhibit conservation, tourism or recreational values, impacts may include:

- Soil compaction, erosion and sediment release to land and water;
- Disturbance of problematic soils such as dispersive or contaminated soils;
- Potential modification to surface water flows (drainage lines and streams);
- Disturbance of significant flora and wildlife habitat;
- Incursion of disease, weeds, vermin or destructive influences to the site; and
- Unauthorised third party access to previously inaccessible areas.

To minimise the potential impacts the Project may have on identified conservation, tourism and recreational land uses, the construction of Project infrastructure will be avoided within these identified sensitive areas wherever possible. Where it cannot be avoided, the required Project infrastructure will be sited in locations sympathetic to the exhibited natural values and designed to minimise the extent of environmental impact. Potential impacts and mitigation measures intended to address existing environmental values are identified in the Air Quality chapter (Section 5) and Noise and Vibration chapter (Section 14) of the SREIS, and the Geology chapter (Section 13) and Landscape and Visual Amenity chapter (Section 20) of the EIS.

13.3.5 Infrastructure

Generalised impacts to infrastructure also remain largely unchanged and may include:

- Minor disruptions to the road network;
- Minor service disruptions to the rail network. However, these are expected to be very minimal;
- Temporary impacts to the Stock Route Network during construction; and
- Potential interference with other utilities and services including high voltage power and bulk water supplies.

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As stated in the EIS, these impacts have all been assigned mitigation or management measures to ameliorate the potential impact as best as possible. Where a conflict between the activities proposed as part of the Project and an underlying land use has been identified, these conflicts are being sought to be managed through Arrow's Environmental Management Standards (Commitments Update (Appendix O) of the SREIS).

It is acknowledged that a significant number of submissions were made on the aforementioned impacts and these have been addressed in the Submission Responses chapter (Section 21) of the SREIS.

13.4 Revised Impacts Resulting from Changes to Project Description

It is acknowledged that a number of changes to the project description have occurred since the release of the EIS relating to the technology and engineering for the Project. These changes to the project description are detailed in full in the Project Description chapter (Section 3) of the SREIS. The changes of relevance to the land use and tenure components are identified below:

- Revised field development plan and sequencing;
- Change to number, type and layout of both wells and facilities;
- Changes to construction techniques; and
- Changes to workforce and accommodation strategy.

In summary, the changes to the project description that will have a material effect on land use impacts are exhibited in Table 13-1.

Table 13-1 Project Components with an Effect on the Potential for Land Use Impact

Project Description Version 3 EIS case	Project Description Version 4 SREIS case
<ul style="list-style-type: none"> • 8,000 km² Project development area; • 14 development regions; and • 17 catchment areas (12 km radius). 	<ul style="list-style-type: none"> • 8,000 km² Project development area; • 9 development regions; and • 33 drainage areas (6 km radius).
Well count up to 6,625.	Well count approximately 4,000.
<ul style="list-style-type: none"> • Well types: Surface-In-Seam (SIS) Chevrons and multi-seam hydraulically fractured; and • No multi-well pads. 	<ul style="list-style-type: none"> • Well types: horizontal SIS Multi Branch Lateral (MBL) and multi-seam hydraulically fractured; and • Max of 6 MBLs on a multi-well pad.
<ul style="list-style-type: none"> • 4 integrated processing facilities (IPFs); • 3 central gas processing facilities (CGPFs); and • 10 field compression facilities (FCFs). 	<ul style="list-style-type: none"> • 2 CGPFs – with co-located water treatment facilities (WTFs); and • 33 FCFs. <p>Note – there is potential for a third WTF to be constructed in the Blackwater region in Phase 2+ of the Project.</p>
Primary power self-generation.	<ul style="list-style-type: none"> • Primary power grid; and • Temporary 2 year self-generation scenario.

The revisions made to the project description will have a number of implications on the underlying land uses of the Project area. While the overall Project area has not been changed at 8,000 km², field

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development planning is now based on 33 drainage areas of approximately 6 km radius (3,732 km²), compared to the 17 development areas of approximately 12 km radius (7,690 km²) as proposed in the EIS.

The decrease in disturbance area, combined with the use of multi-well pad sites and a reduction in other Project infrastructure, including the overall amount of gathering lines required, is expected to lessen the magnitude of impacts generally across all land uses. Project infrastructure within these areas includes wells, field compression facilities, pipelines and water and power infrastructure.

Changes to the Project footprint result from two changes to the material rollout and development of the Project. The first is the reduction in number of temporary accommodation camps from four smaller camps (sized to accommodate between 300 and 400 persons each) to two larger camps (sized to accommodate approximately 1,200 persons each).

The second is the reduction in well numbers (from approximately 6,225 to approximately 4,000) combined with the development of multi-well pad sites. Where possible, multiple wells may be grouped on a singular pad location to form a multi-well pad. As the multi-well pads consolidate a group of wells at one surface location, targeting multiple coal seams, they will typically thus allow:

- A reduction in the total number of well pad sites;
- A reduction in the individual pad area required per well;
- A significant reduction in the linear infrastructure (pipelines) and roads required to hook up wells; and
- An increase in the distance between any two well sites.

The reduction in the overall disturbance, number of wells and development areas will decrease the number of different land uses subject to direct impacts within the Project development area.

13.4.1 Agriculture

Agricultural enterprises (pastoral and cropping) within the Project area will be affected by impacts similar to those identified in the EIS and summarised in Section 13.3.1. However, there will be significantly less areas of direct disturbance during construction due to the reductions in Project infrastructure and activities, as summarised in Section 13.4. In addition, the resulting material changes to the Project will dissipate the impacts across the size and scale of Project area.

It is acknowledged that not all agricultural enterprises will experience a reduction in impacts from that exhibited in the EIS. However, it is likely that where impact levels are similar to those exhibited in the EIS, the disturbance to on-farm activities will be lessened as impacts will be more localised and concentrated around the construction and operation of above and below ground infrastructure in consolidated areas.

It is anticipated that the potential agricultural impacts can be mitigated appropriately through the mitigation measures presented in the EIS and any new management measures identified in Section 13.5.

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13.4.2 Urban and Residential Development

In accordance with the recently released Central Queensland Regional Plan (refer to Project Approvals chapter (Section 2) of the SREIS) Arrow has adopted 2 km setbacks for urban areas with a population of 200 people or more and 200 m setbacks for urban or residential land uses outside of these population centres. As a result of the setback and separation distances between urban and residential land uses and the combined reduction in construction and operational activities (Table 13-1), impacts to these land uses are expected to decrease in magnitude.

Some urban and residential land uses within the Project area will still be subject to the impacts identified in the EIS and summarised in Section 13.3.2. However, due to the reductions in the footprint and disturbance of the Project, many of the impacts which were originally stated in the EIS will be observed to be at a lesser magnitude. This is particularly evident for impacts which relate to reductions in amenity afforded to the subject land use.

13.4.3 Mining and Resources

It is acknowledged that there are significant areas of overlap between Arrow's petroleum tenements and other resource tenements in the Bowen Basin, including those tenements of operating coal mines. Like agricultural and urban land uses, some areas of mining and resource activity will experience a reduction in the level of impacts the Project is likely to generate, as detailed in the Project Description chapter (Section 3) of the SREIS and summarised in Table 13-1.

As stated in the EIS, Arrow is committed to establishing agreements with overlapping tenure holders to minimise impacts of the Project on the mining of coal resources within the Project area, as per the provisions of the *Petroleum and Gas (Production and Safety) Act 2004* and the *Mineral Resources Act 1989*. Arrow is aware that at the time of preparing the SREIS, a number of changes were being initiated by the State government with regards to the way overlapping tenures are managed and administrated in Queensland. As such, any negotiations and subsequent agreements with overlapping tenure holders will be developed in accordance with the regulatory framework at the time.

13.4.4 Conservation, Tourism and Recreation

Direct and indirect impacts on land uses which hold conservation, tourism and recreational values will decrease in magnitude as per the summary contained in Section 13.4 and Table 13-1. The reduction in footprint and associated disturbance area will result in an overall reduction in the magnitude of impacts presented in the EIS.

Changes to the project description on ecological values within conservation areas are discussed further in the Surface Water chapter (Section 8), Aquatic Ecology chapter (Section 10) and Terrestrial Ecology chapter (Section 11) of the SREIS.

13.4.5 Community Infrastructure

Potential impacts to community infrastructure are also likely to decrease in response to the proposed reduction in construction and operational activities.

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Whilst there were no permanent impacts to community infrastructure and services identified in the EIS, there may still be some incidences of potential conflict between the construction of Project infrastructure and elements of the road, rail, stock route, aeronautical, water, gas and power networks as detailed in the EIS. These incidences of potential conflict can be adequately managed through the existing mitigation and management provisions detailed in the EIS.

Further details surrounding the potential impacts of the revised project description on roads, associated mitigation measures and statutory compliance of the Project is detailed within the Roads and Transport chapter (Section 12) of the SREIS.

13.4.5.1 Stock Routes

As exhibited throughout this chapter, there is anticipated to be an overall reduction in the level of impact on the underlying land uses of the Project area from those impacts described in the EIS. This general reduction is also applicable for elements of the Stock Route Network. Where the Stock Route Network is identified as potentially being temporarily impacted during construction, Arrow is committed to ensuring adequate alternatives are proposed during construction activities and ensuring the safety of stock and people utilising the temporary realignment.

The Project will comply with legislative requirements under the *Land Protection (Pest and Stock Route Management) Act 2002*, where relevant. This includes NRM requirements that proposed activities do not negatively impede upon the integrity of the Stock Route Network and that all elements of the Stock Route Network remain intact, even if they have been unused for a number of years.

Arrow will consult with all entities involved in stock route administration, such as the Stock Route Management Unit of NRM, where the Project is likely to impact on the Stock Route Network.

13.4.6 Impact Summary

For those land holders likely to be impacted, there may still be some disruption to agricultural enterprises and practices on farms, reductions in amenity afforded to residential lands, potential conflict with other resource operations, reductions in the 'open space' values and similar levels of interference with infrastructure. Arrow will negotiate and provide appropriate compensation for landholders where impacts cannot be avoided. This will also provide funds to allow farmers to re-adjust their farm models to increase productivity, to some extent offsetting the decline associated with the Project [B630]. There are likely to be fewer areas of disturbance and potential for a higher level of concentration of activities in the areas where infrastructure is still proposed.

The principal change resulting from the revisions made to the project description will be noticed by those land uses subject to the direct impacts of construction activity. While some areas will see a lessening of impacts to that outlined in the EIS, others will likely experience a negligible increase. The lessening of impacts will be noticed most where there is a reduction in the total number of wells and other associated above and below ground infrastructure.

This will have a twofold effect including:

- The reduction in overall disturbance and displacement area; and
- The associated reduction in activity during construction and, to a lesser extent, operation.

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13.5 Additional and/or Revised Management Measures

Table 13-2 identifies new and/or revised environmental management measures released by Arrow since the EIS which will assist in the amelioration of impacts to the land uses of the Project area.

Additional details regarding these management measures can be found in the Commitments Update (Appendix O) of the SREIS.

Table 13-2 Additional and/or Revised Arrow Management Measures since EIS

Underlying Land Use	Management Measures
Agriculture	<ul style="list-style-type: none"> • Land Management (Soil) Standard 99-H-MSS-0036; • Air Quality Standard 99-H-MSS-0037; • Amenity Standard 99-H-MSS-0040; • Coal Seam Gas Water Standard 99-H-MSS-0035; and • Groundwater Standard 99-H-MSS-0041.
Urban and Residential	<ul style="list-style-type: none"> • Air Quality Standard 99-H-MSS-0037; and • Amenity Standard 99-H-MSS-0040.
Mining and Resources	As per the management measures provided in the EIS.
Conservation, Tourism and Recreation	<ul style="list-style-type: none"> • Biodiversity Standard 99-H-MSS-0034; • Land Management (Soil) Standard 99-H-MSS-0036; • Air Quality Standard 99-H-MSS-0037; • Waste Management Standard 99-H-MSS-0039; • Amenity Standard 99-H-MSS-0040; • Groundwater Standard 99-H-MSS-0041; and • Coal Seam Gas Water Standard 99-H-MSS-0035.
Infrastructure	As per the management measures provided in the EIS.

13.6 Revised Impact Magnitude and Associated Mitigation

Table 13-3 provides a summary of the impacts assessed as having a revised significance ranking based on updates to the project description and updated land use data.

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Table 13-3 Summary of Changes to Impacts

Potential Impact	Status	Phase	Likelihood	Consequence	Significance
Impacts to agricultural land uses	Decreased consequence depending on the proposed location of project infrastructure and associated construction activity.	Construction and operation	Moderate. However in some instances this will have lessened.	Moderate. However in some instances this will have lessened.	Moderate. However in some instances this will have lessened.
Impacts to urban and residential development	Decreased consequence depending on the proposed location of project infrastructure and associated construction activity.	Construction and operation	Moderate. However in some instances this will have lessened.	Moderate. However in some instances this will have lessened.	Moderate. However in some instances this will have lessened.
Impacts to mining and resource enterprises			The project description changes are not likely to alter the level of significance for this category of impact.		
Impacts to conservation, tourism and recreational values	Decreased consequence depending on the proposed location of project infrastructure and associated construction activity.	Construction and operation	Moderate. However in some instances this will have lessened.	Moderate. However in some instances this will have lessened.	Moderate. However in some instances this will have lessened.
Impacts to infrastructure and services	Decreased consequence depending on the proposed location of Project infrastructure and associated construction activity.	Construction	Low	High	Moderate