

Surat –DXP Plan of Operations Plan

Environmental Authority: EPPG00972513

DXP (PL198, PL230, PL238, PL252, PL258, and PL260)
1 June 2025 to 31 May 2027

Version	3.0
Released	May 2025
Document Owner	Operations Director
Document Author	Environmental Advisor – Compliance and Assurance
Review Date	Not Applicable
Document Status	Issued for Use
Security Classification	Restricted

Please see document administration section for more information

Contents

1.	Introduction	3
1.1	Purpose and Scope	3
1.2	Timeframe	3
2.	Plan of Activities (Existing and Planned)	3
2.1	Water Storage and Management	3
3.	Rehabilitation Program	4
4.	Action Program	4
5.	Document Administration	15
	Appendix A – Figures	16

1. Introduction

Arrow Energy Pty Ltd, Arrow (Tipton Two) Pty Ltd, Arrow (Tipton) Pty Ltd, Arrow CSG (Australia) Pty Ltd and Arrow (Daandine) Pty Ltd are the holders of Environmental Authority (EA) EPPG00972513 for Arrow's Dalby Expansion Project (DXP). This EA authorises petroleum activities within petroleum lease (PL) PL198, PL230, PL238, PL252, PL258, and PL260 which are located northwest, west and southwest of Dalby, Central Queensland. Arrow is developing these leases for the production of coal seam gas (CSG).

1.1 Purpose and Scope

This Plan of Operations (PoO) has been prepared in accordance with Section 292 of the *Environmental Protection Act 1994* (EP Act), which requires the preparation of a plan of operations for petroleum activities undertaken by Arrow within petroleum leases authorised under EPPG00972513.

This Plan describes actual activities completed to date, activities currently planned and current data.

1.2 Timeframe

The Plan of Operations is effective for the period of 1 June 2025 to 31 May 2027.

2. Plan of Activities (Existing and Planned)

Existing and planned activities including water balance and material balance are described in section 2.1, Table 1 and the ERC calculator. Existing disturbance is also described in the shape files provided with this plan as well as in Appendix A (Figure 1 – Figure 8).

2.1 Water Storage and Management

Arrow manages brackish produced CSG water from its production fields (Tipton West, Daandine, Stratheden and Kogan North) through a combination of water storage dams and two water treatment facilities, which are located at Daandine and Tipton. The treatment facilities allow for the treatment and beneficial use of CSG water generated through production activities.

Arrow also operates water storage infrastructure relating to gas compression.

In addition to the above, through Arrow's Water Services Agreement with QGC, produced water will be transferred into the QGC regional water management network for subsequent treatment at QGC's Kenya Water Treatment Facility (WTF). Brine produced at the Kenya WTF will be stored in Arrow's Kenya Brine Dam 1 (EA0001540). Treated water will be supplied to beneficial end users through Sun Water's existing Chinchilla Weir Scheme (End of Waste Approval ENEW07542418), or alternatively for beneficial end use from a future Arrow treated water supply network.

Water Storage

There are currently 14 production dams (aggregation, brine and treated water dams) within the DXP. All dams are homogeneous earthen embankments.

Three historical dams have been fully decommissioned, and rehabilitation of the areas is complete (not certified).

For the purposes of applying rates to dams for financial assurance, the dam size is based on crest volume. Costs for rehabilitation of dams including spreading of stockpiled topsoil is covered in the ERC calculator.

Water Treatment

CSG water is treated at water treatment plants (WTPs) at Daandine (PL230) and Tipton (PL198). Both facilities have a treatment capacity of approximately 12 ML/day.

The WTP process includes microfiltration, reverse osmosis and blending and or ionic amendment. The operational area of the RO plants includes facilities for storage of chemicals and other materials as necessary for plant operation.

Temporary and permanent pump stations are installed across the various facility water storages to transfer water between dams, for treatment, for long term storage and to beneficial end users.

Arrow maintains an integrated water and salt balance model used to forecast water production and dam level scenarios to assist with the development of water management strategies. The water balance model was developed in the GoldSim software package. GoldSim provides a robust, industry standard water balance modelling software that allows the user to perform Monte Carlo simulations and gain an insight into uncertainty associated with model predictions.

The integrated water and salt balance model is utilised to:

- determine the water management philosophy for the flows generated by all existing and proposed fields to be developed as part of the project;
- identify the infrastructure needs to realise the water management philosophy; and
- identify agreements required to support the water management philosophy.

3. Rehabilitation Program

Rehabilitation activities undertaken to date and the rehabilitation plan and schedule are described in Table 2 below.

4. Action Program

Arrows action program for the DXP EA EPPG00972513 is provided in Table 3 below.

Table 1 Plan of Activities (Existing and Planned)

			Existing Activities	Existing	Dis (D1)	Reh (R1)	Reh (R2)	CR (R3)	Proposed Activities	2025	2025	2026	2026	2027	2027
Domain	Activity Type	Tenure (Location)	Description of Existing infrastructure	Parameters (km)	Disturbance Area (ha)	Disturbance Area (ha)	Disturbance Area (ha)	Disturbance Area (ha)	Description of proposed infrastructure	Parameters (km)	Disturbance Area (ha)	Parameters (km)	Disturbance Area (ha)	Parameters (km)	Disturbance Area (ha)
Exploration	Temporary Camps	PL198, PL230, PL238, PL252, PL258, and PL260	Hillview Camp (0.75 ha), STP camp 002 (1.3 ha) and NSP2_Camp (0.1 ha)	0.0	2.15	0.0	0.0	0.0	Three temporary camps are proposed occupying 2.45 ha	0.0	0.97	0.0	1.48	0.0	0.0
Roads, tracks, laydowns and borrow pits	Roads	PL198, PL230, PL238, PL252, PL258, and PL260	Road upgrade areas covering 25.72 ha	0.0	0.17	25.55	0.0	0.0	Several road upgrade projects are proposed covering 35.9 ha	0.0	25.0	0.0	10.9	0.0	0.0
Roads, tracks, laydowns and borrow pits	Access track	PL198, PL230, PL238, PL252, PL258, and PL260	146.78 km of access track is located within right of way. 203.46 km of access track is located outside of the RoW.	203.46	160.83	0.35	0.0	0.0	Most proposed access tracks will utilise the Right of Way (RoW). 41.15 km of access track will be constructed outside the RoW.	11.15	12.68	20.0	22.85	10.0	11.43
Roads, tracks, laydowns and borrow pits	Laydowns	PL198, PL230, PL238, PL252, PL258, and PL260	DXP laydown areas – 19 existing	0.0	20.36	9.14	0.0	0.0	9 laydowns (10.62 ha) are proposed	0.0	5.0	0.0	5.62	0.0	0.0
Roads, tracks, laydowns and borrow pits	Borrow Pit	PL198, PL230, PL238, PL252, PL258, and PL260	None	0.0	0.0	0.0	0.0	0.0	1 borrow pit is proposed, 7.84 ha. If suitable material will be used for projects within DXP tenures. Excavation to a depth of 2.0 m over 7.84 ha will result in the removal of approximately 156,800 m ³ during the plan of operations period.	0.0	4.0	0.0	3.84	0.0	0.0
Camps, Buildings and Sewage Treatment Plants	Stand-alone permanent building	PL198, PL230, PL238, PL252, PL258, and PL260	Dalby Dve epot and Dalby Office	0.0	4.33	0.0	0.0	0.0	None	0.0	0.0	0.0	0.0	0.0	0.0
Power generation and distribution	Communications Tower	PL198, PL230, PL238, PL252, PL258, and PL260	2 communications towers exist (Longswamp Tower and David IPF Comms Tower) with one under construction (Plainview Comms Tower)	0.0	0.54	0.0	0.0	0.0	One communications tower is proposed.	0.0	0.75	0.0	0.0	0.0	0.0
Gas Processing and Oil Storage Facilities	Gas Processing Facility	PL198, PL230, PL238, PL252, PL258, and PL260	Daandine CGPF, Daandine Compressors, Tipton CGPF, Tipton Compressors and David IPF	0.0	6.49	0.0	0.0	0.0	None proposed	0.0	0.0	0.0	0.0	0.0	0.0
Water Treatment Plants and Transfer Stations	Water Treatment Plant	PL198, PL230, PL238, PL252, PL258, and PL260	Daandine Water Treatment Facility and Tipton Water Treatment Facility	0.0	1.95	0.0	0.0	0.0	None proposed	0.0	0.0	0.0	0.0	0.0	0.0

			Existing Activities	Existing	Dis (D1)	Reh (R1)	Reh (R2)	CR (R3)	Proposed Activities	2025	2025	2026	2026	2027	2027
Domain	Activity Type	Tenure (Location)	Description of Existing infrastructure	Parameters (km)	Disturbance Area (ha)	Disturbance Area (ha)	Disturbance Area (ha)	Disturbance Area (ha)	Description of proposed infrastructure	Parameters (km)	Disturbance Area (ha)	Parameters (km)	Disturbance Area (ha)	Parameters (km)	Disturbance Area (ha)
Well pads and associated infrastructure	Well pads	PL198, PL230, PL238, PL252, PL258, and PL260	Of 548 well pads in place; Rehabilitation has commenced at 458 pads and rehabilitation is complete at 90 well pads with monitoring ongoing (10 of the 548 pads were cleared and rehabilitated without installation of a well).	0.0	0.0	288.86	34.49	0.0	77 single CSG wells on single well pads, 92 wells on 30 multi-well pads (<=4 CSG wells per pad) and 39 wells on 7 multi-well pads (>4 CSG wells per pad) are proposed.	0.0	39.7	0.0	50.0	0.0	20
Pipelines	Right of Way	PL198, PL230, PL238, PL252, PL258, and PL260	Typically, gas and water gathering lines share the same Right of Way. Multiple pipelines can be present in the same Right of Way.	481.31	2.72	1,114.31	0.0	0.0	165.33 km of Right of Way will accommodate co-located gas and water pipelines (381.43 ha).	41.33	95.36	82.67	190.72	41.33	95.36
Pipelines	Gas Pipeline	PL198, PL230, PL238, PL252, PL258, and PL260	Detail of existing gas pipelines including crossings and diameter is provided in the ERC calculator.	466.18	0.0	0.0	0.0	0.0	123.52 km <0.5 m diameter and 41.99 km >0.5 m diameter gas pipeline is proposed. Proposed gas pipeline crossings will consist of: 16 <500 mm diameter pipe road crossings (TOV#6.124) 1 >500 mm diameter pipe road crossings (TOV#6.125) 3 <500 mm diameter pipe rail crossings (TOV#6.126) 7 <500 mm diameter pipe watercourse crossings (TOV#6.128) 8 >500 mm diameter pipe watercourse crossings (TOV#6.129)	41.38	0.0	82.76	0.0	41.38	0.0
Pipelines	Water Pipeline	PL198, PL230, PL238, PL252, PL258, and PL260	Water pipelines are co-located in the same RoW as gas pipelines. Rehabilitation is covered in the RoW and crossings costs in the ERC Calculator.	527.72	0.0	0.0	0.0	0.0	150.35 km <0.5 m diameter and 26.93 km >0.5 m diameter water pipeline is proposed. Proposed water pipelines will be co-located in the same RoW as proposed gas pipelines. Proposed water pipeline crossings will consist of: 18 <500 mm diameter pipe road crossings (TOV#6.124) 1 >500 mm diameter pipe road crossings (TOV#6.125) 3 <500 mm diameter pipe rail crossings (TOV#6.126) 8 <500 mm diameter pipe watercourse crossings (TOV#6.128)	44.3	0.0	88.6	0.0	44.3	0.0

			Existing Activities	Existing	Dis (D1)	Reh (R1)	Reh (R2)	CR (R3)	Proposed Activities	2025	2025	2026	2026	2027	2027
Domain	Activity Type	Tenure (Location)	Description of Existing infrastructure	Parameters (km)	Disturbance Area (ha)	Disturbance Area (ha)	Disturbance Area (ha)	Disturbance Area (ha)	Description of proposed infrastructure	Parameters (km)	Disturbance Area (ha)	Parameters (km)	Disturbance Area (ha)	Parameters (km)	Disturbance Area (ha)
									6 >500 mm diameter pipe watercourse crossings (TOV#6.129)						
Water Storage Infrastructure	Regulated Dams	PL198, PL230, PL238, PL252, PL258, and PL260	10 regulated dams are active. A copy of the regulated dam register has been provided. Rehabilitation of Stratheden Transfer dam is complete and monitoring ongoing.	0.0	395.01	0.0	2.6	0.0	No new water storage infrastructure is proposed.	0.0	0.0	0.0	0.0	0.0	0.0
Water Storage Infrastructure	Non-regulated Dam - lined	PL198, PL230, PL238, PL252, PL258, and PL260	4 non-regulated dams are active. Rehabilitation of the Tipton West CGPF Dam 2 is complete and monitoring ongoing.	0.0	27.43	0.0	0.43	0.0	No new water storage infrastructure is proposed.	0.0	0.0	0.0	0.0	0.0	0.0
Water Storage Infrastructure	Non-regulated Dam - unlined	PL198, PL230, PL238, PL252, PL258, and PL260	Rehabilitation of the Tipton West Pilot Dam is complete and monitoring ongoing.	0.0	0.0	0.0	9.66	0.0	No new water storage infrastructure is proposed.	0.0	0.0	0.0	0.0	0.0	0.0
Additional Activities	Other	PL198, PL230, PL238, PL252, PL258, and PL260	Additional activities include: 6 flare areas, 22 extra work areas (EWA), two weather stations, stockpiles, a helipad at Daandine, a metering station, three HP/LV vents, a substation, a water take off point, four stockpile areas and four disturbed areas (27.14 ha total).	0.0	17.72	7.01	2.41	0.0	Additional activities include a stockpile and 148 EWAs (10.98 ha).	0.0	8.0	0.0	3.1	0.0	0.0
			Existing disturbance (ha)	2,134.49					Proposed disturbance (ha)	606.74					

Notes:

1. The lease land is described in the spatial information provided. This includes original land use, post-operational land use, sensitive receptors, and the project boundary. Further information about the land to which the plan applies is provided in Q.7 of the Plan of Operations submission form. 2. The Plan of Activities describes existing and proposed activities. Spatial information for existing activities and their rehabilitation status in accordance with the applicable schema is also provided. 3. Table 2 - The Rehabilitation Program (including plan and schedule) also satisfies the rehabilitation plan requirements of the ERC application form.

Table 2 Rehabilitation Program

Domain	Activity Type	Tenure (Location)	Rehabilitation Program (including Rehabilitation Plan & Schedule)			
			Rehabilitation Program (including Rehabilitation Plan & Schedule)	Timing	Rehabilitation Methodology	Rehabilitation Works already undertaken
Exploration	Temporary Camps	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	Within 3 months of cessation of use.	All new and existing temporary camps will remain in use throughout the period of this Plan of Operations. Where possible during the period, transitional rehabilitation will be undertaken. Temporary construction and drilling camps are used for the duration of activities and will be rehabilitated after construction has ceased. Soil is compacted and topsoil spread on the surface with amelioration and seeding (occurring within 1-2 months). If required erosion and sediment controls are in place until site is stabilised with regrowth. Monitoring continues for the life of the project.	None to date
Roads, tracks, laydowns and borrow pits	Roads	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	Defects period (2yrs)	Road upgrades in road corridors will be maintained during a 2 year defects period. Post defects period maintenance responsibilities will be returned to the road authority.	Several road upgrade works have been completed
Roads, tracks, laydowns and borrow pits	Access track	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	End of working life or end of project.	All new and existing access tracks will remain in use throughout the period of this Plan of Operations and will be rehabilitated at the end of the project.	A small portion of access track has been rehabilitated
Roads, tracks, laydowns and borrow pits	Laydowns	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	End of working life or end of project.	All new and existing laydown yards will remain in use throughout the period of this Plan of Operations and will be rehabilitated at the end of their working life or at the end of the project. Extra Work Areas are used for the duration of (pad/well/pipeline) construction activities and will be rehabilitated at the same time as the pipeline easement once the pipe is laid and the trench backfilled (within 1-2 months). Soil is compacted, and topsoil spread on the surface with amelioration and seeding (occurring within 1-2 months). If required erosion and sediment controls are in place until site is stabilised with regrowth. Monitoring continues for the life of the project.	Rehabilitation has commenced at 2 laydown yards
Roads, tracks, laydowns and borrow pits	Borrow Pit	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	End of working life or end of project.	All new and existing borrow pits will remain in use throughout the period of this Plan of Operations and will be rehabilitated at the end of their working life or at the end of the project. Rehabilitation of borrow pits includes erosion and drainage control. Re-profiling of significantly disturbed land to a stable landform. Re-spreading of stockpiled topsoil. Species selection and re-establishment of vegetation. Maintenance and monitoring.	Proposed borrow pit has not been excavated yet
Camps, Buildings and Sewage Treatment Plants	Stand-alone permanent building	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	End of working life or end of project.	All permanent buildings will remain in use throughout the period of this Plan of Operations and will be repurposed or decommissioned at the end of the project.	None to date
Power generation and distribution	Communications Tower	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	End of working life or end of project.	All communications towers will remain in use throughout the period of this Plan of Operations. Rehabilitation will occur at the end of the project.	None to date

Domain	Activity Type	Tenure (Location)	Rehabilitation Program (including Rehabilitation Plan & Schedule)			
			Rehabilitation Program (including Rehabilitation Plan & Schedule)	Timing	Rehabilitation Methodology	Rehabilitation Works already undertaken
Gas Processing and Oil Storage Facilities	Gas Processing Facility	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	End of working life or end of project.	All gas processing facilities will remain in use throughout the period of this Plan of Operations. Rehabilitation will occur at the end of the project.	None to date
Water Treatment Plants and Transfer Stations	Water Treatment Plant	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	End of working life or end of project.	All existing water treatment plants and water transfer stations will remain in use throughout the period of this Plan of Operations. Rehabilitation will occur at the end of the project.	None to date
Well pads and associated infrastructure	Well pads	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	2025/2026/2027. Each new well footprint will be reduced to an operational area within 3-6 months of construction. Final P&A will occur at the end of the working life of the well. A well pad is only considered fully rehabilitated (not certified) when all wells have been P&A'd.	Arrow undertakes transitional rehabilitation as soon as practicable (usually within 3-6 months) after the completion of an activity causing disturbance to land. This includes regrading and stabilisation: Re-profiling significantly disturbed land to a stable landform similar to original land contours. Re-establishing surface drainage lines on significantly disturbed land. Re-establishment of vegetation around completed wells. Once the well is constructed the area surrounding the wellhead is stabilised and vegetation commences re-establishment, the disturbed footprint is reduced to an operational area within 6 months. Rehabilitation monitoring is undertaken at appropriate time intervals thereafter. In accordance with the DETSI spatial data master schema, in spatial files well pads that have commenced rehabilitation are assigned a status of R1 (rehabilitation commenced) and well pads where all wells have been P&A have a status of R2 (rehabilitation completed not certified). Most Arrow infrastructure has an estimated life span of approximately 20 years. Therefore, transitional rehabilitation comprises the majority of rehabilitation activities.	Rehabilitation has commenced on 458 well pads. Rehabilitation is complete on 90 well pads with monitoring ongoing.
Pipelines	Right of Way	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	Within 3 months of pipe laying	All new and existing pipelines will remain in use throughout the period of this Plan of Operations and will be rehabilitated at the end of their working life or the end of the project. Once pipe is laid the trench is backfilled, compacted and topsoil spread on surface with amelioration and seeding (occurring within 1-2 months) reducing the ROW to only the access track width (6 m). If required erosion and sediment controls are in place until site is stabilised with regrowth. Monitoring continues for the life of the project.	None to date

Domain	Activity Type	Tenure (Location)	Rehabilitation Program (including Rehabilitation Plan & Schedule)			
			Rehabilitation Program (including Rehabilitation Plan & Schedule)	Timing	Rehabilitation Methodology	Rehabilitation Works already undertaken
Pipelines	Gas Pipeline	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	Within 3 months of pipe laying	All new and existing pipelines will remain in use throughout the period of this Plan of Operations and will be rehabilitated at the end of their working life or the end of the project. Once pipe is laid the trench is backfilled, compacted and topsoil spread on surface with amelioration and seeding (occurring within 1-2 months) reducing the ROW to only the access track width (6 m). If required erosion and sediment controls are in place until site is stabilised with regrowth. Monitoring continues for the life of the project.	None to date
Pipelines	Water Pipeline	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	Within 3 months of pipe laying	All new and existing pipelines will remain in use throughout the period of this Plan of Operations and will be rehabilitated at the end of their working life or the end of the project. Once pipe is laid the trench is backfilled, compacted and topsoil spread on surface with amelioration and seeding (occurring within 1-2 months) reducing the ROW to only the access track width (6 m). If required erosion and sediment controls are in place until site is stabilised with regrowth. Monitoring continues for the life of the project.	None to date
Water Storage Infrastructure	Regulated Dam	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	End of working life or end of project.	All existing water storage infrastructure required for ongoing operations is in care and maintenance and will remain in use throughout the period of this Plan of Operations. Infrastructure will be rehabilitated at the end of its working life or the end of the project.	Stratheden Transfer Dam has been rehabilitated with monitoring ongoing.
Water Storage Infrastructure	Non-regulated Dam - lined	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	End of working life or end of project.	All existing water storage infrastructure required for ongoing operations is in care and maintenance and will remain in use throughout the period of this Plan of Operations. Infrastructure will be rehabilitated at the end of its working life or the end of the project.	Tipton West CGPF Dam 2 has had rehabilitation completed with monitoring ongoing.

			Rehabilitation Program (including Rehabilitation Plan & Schedule)			
Domain	Activity Type	Tenure (Location)	Rehabilitation Program (including Rehabilitation Plan & Schedule)	Timing	Rehabilitation Methodology	Rehabilitation Works already undertaken
Water Storage Infrastructure	Non-regulated Dam - unlined	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	End of working life or end of project.	All existing water storage infrastructure required for ongoing operations is in care and maintenance and will remain in use throughout the period of this Plan of Operations. Infrastructure will be rehabilitated at the end of its working life or the end of the project.	Tipton West Pilot Dam rehabilitated with monitoring ongoing.
Additional Activities	Other	PL198, PL230, PL238, PL252, PL258, and PL260	forestry/mining/grazing/cropping	End of working life or end of project.	Storage and spoil areas associated with the project will remain in use for the duration of this plan. Soil is compacted, and topsoil spread on the surface with amelioration and seeding (occurring within 1-2 months). If required erosion and sediment controls are in place until site is stabilised with regrowth. Monitoring continues for the life of the project.	Rehabilitation has commenced at DA Stockpile 01, TP Disturbance 1 and 2 and two high point vents at Tipton. Rehabilitation is complete with monitoring ongoing at Daandine RDM Storage. Areas will remain in care and maintenance for the duration of this Plan of Operations.

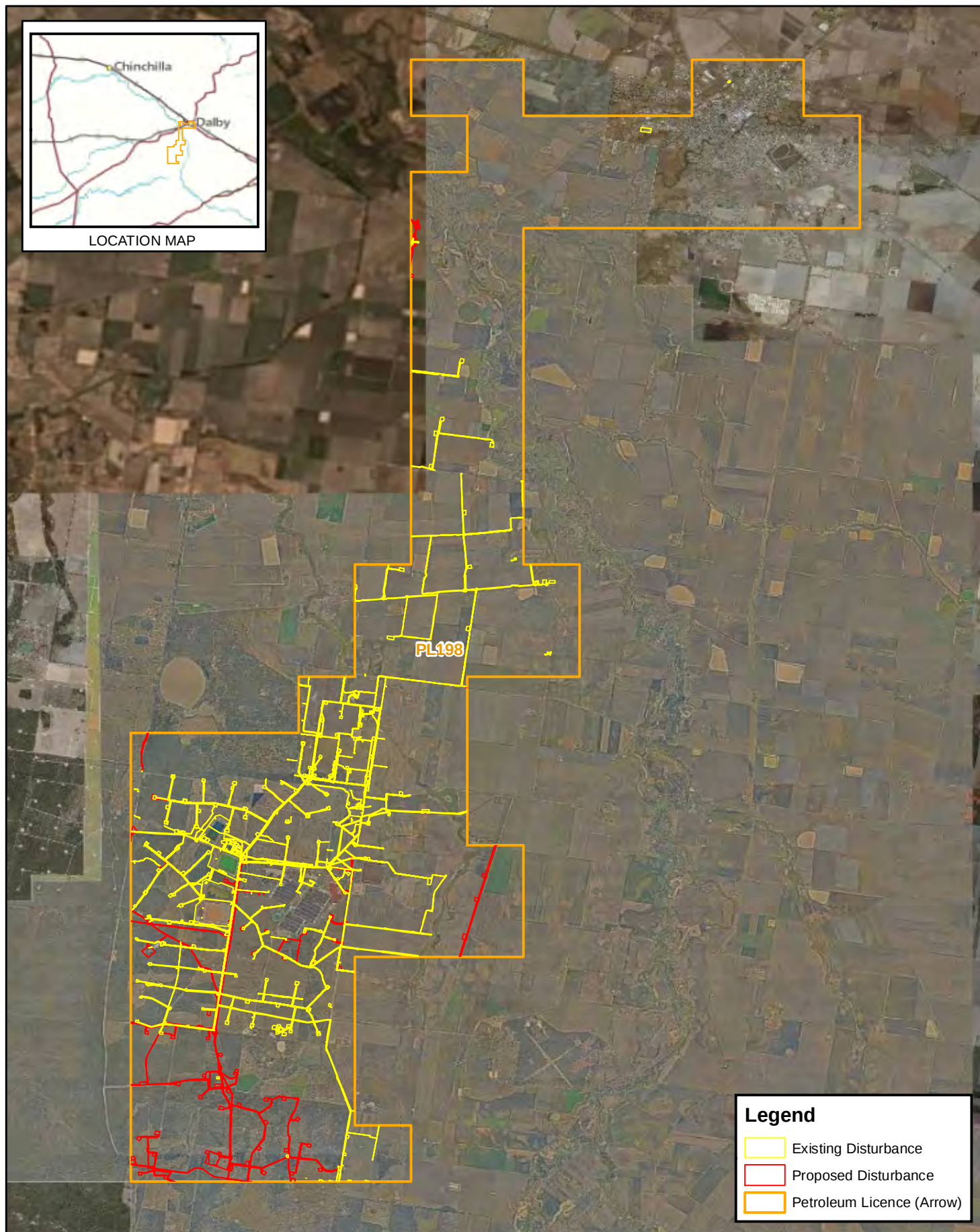
Table 3 Rehabilitation Program

EA Condition	Internal Process/Management System	Environmental Management Strategies
Schedule A - General	HSE Management System HSE Standards Compendium - management system standards, personal safety, security and incident response, health and hygiene, environment and process safety. Compliance, Assurance, Incident and Risk Management System (CAIRM). Complaints management system.	Arrow's environmental policy governs the development and implementation of Arrow's HSEMS. The HSEMS is a hierarchical document structure that describes what Arrow can do and how it can do it, to keep its staff and contractors safe and minimise the environmental impact of its activities. It is generally aligned with Australian Standard 4801 and International Standards Organisation 14001. Plans and procedures under the HSEMS manage Arrow's environmental risk in relation to: Air quality, Geology, landform and soils, Landscape and visual amenity, Terrestrial ecology, Groundwater, Surface water, Aquatic ecology, Coal seam gas water, Dams, Noise and vibration, Waste, Cultural heritage, Roads and transport, Agriculture. As necessary standards, procedures, plans, etc. are developed in consideration of industry and Government guidelines. By implementing the HSEMS Arrow ensures that its operations are compliant with all relevant environmental legislation, regulations, licences, permits, standards, approvals and authorities. Deliverables, actions and outcomes, including incidence reporting and tracking, are recorded in CAIRM. The Arrow HSE Standards Compendium - Standards for the management of Health, Safety and Environment (ORG-ARW-HSM-STA-00001) provide a set of consistent and objective requirements that have mandatory application across Arrow's business and contractors. Specifically, the HSE Standards: - Set and formalise expectations to staff and contractors - Define what must be achieved in relation to HSE - Provides auditable criteria - Establishes a basis to continual improvement Arrow maintains a complaint management system to ensure that all complaints are managed in an accountable, transparent, timely and meaningful way. The system includes recording and tracking grievances through an established network of land liaison officers and through Arrow's website, 1800 Community line or email (info@arrow.com.au).
Schedule B - Water	HSE MS Standards Compendium – Biodiversity, Coal seam gas water, land management, waste, groundwater.	Arrow undertakes ecological impact assessments as a prerequisite for site access and prior to commencing significant land disturbance for all of Arrow's development activities. These assessments, including both desktop and/or field assessment as applicable, establish the ecological and biodiversity characteristics of areas, including watercourses, wetlands, lakes and springs that may be disturbed. The assessments are also used to identify site-specific ecological constraints and opportunities (e.g. sensitive ecological features, areas of high biodiversity value, ESAs, high value waters, weeds and pests, etc.), and management requirements to avoid, minimise or mitigate environmental harm associated with land disturbance activities. Assessments are used to inform site selection, site-specific management plans and procedures (fauna, flora, pest, etc.), future rehabilitation requirements and offsets where residual impacts remain. Arrow constructs infrastructure in accordance with specifications developed in consideration of relevant Australian Standards, Codes of Practice (e.g. APGA Code of Environmental Practice) and Guidelines (e.g. Queensland Urban Drainage Manual) document how overland flow / flood flow and site drainage is addressed. Further, Arrow undertakes flood studies and prior to development undertakes site-specific overland flow assessments to mitigate and manage impacts on surface water. As far as possible Arrow seeks to maximise beneficial reuse of CSG water and minimise environmental impacts associated with water use and disposal. It also seeks (where possible) to manage coal seam gas water in such a way as to mitigate the impacts on aquifers. Arrow manages produced CSG water through a combination of water storage dams and water treatment facilities. The treatment facilities allow for the treatment and beneficial use of CSG water generated through production activities. Further, Arrow's Water Services Agreement with QGC allows for produced water to be transferred into the QGC regional water management network for subsequent treatment at QGC's Kenya Water Treatment Facility. Site-specific erosion and sediment control plans developed for individual projects address potential impacts of construction activities on surface water and/or groundwater. Site-specific seepage monitoring programs, including the installation of seepage monitoring bores and plans for early detection of seepage of contaminants, are used to mitigate and manage risks associated with containment facilities.
Schedule BE – Coal Seam Gas Water Injection Trial	HSE MS Standards Compendium – Coal Seam Gas Water	The proposed coal seam gas water injection trial has not been undertaken to date.

EA Condition	Internal Process/Management System	Environmental Management Strategies
Schedule C – Regulated Dams	HSE MS Standards Compendium - Coal Seam Gas Water.	Arrow manages dams as part of its water management system, providing operational storage or water balance capacity to ensure containment of coal seam gas water. Arrow maintains a regulated dam register that documents the names, types, consequence category, dimensions, storage capacity, certification by suitably qualified and experienced persons and inspections. Annual inspections are undertaken to ensure structural soundness and compliance with performance standards. Procedures and criteria used for operating dams, including management, maintenance and monitoring are defined in individually developed asset operating plans. These operating plans include: operating guidelines, emergency management, inspections checklists, regulatory reporting and notification requirements, the surface and groundwater monitoring programs developed.
Schedule D - Land	HSEMS Standards Compendium – chemical management, land management; biodiversity. Pipeline management system. CAIRM. GIS database. Access and Approvals Process. Offset tracking database.	Erosion, sediment control, clean water diversion and soil management are key aspects associated with land disturbance and managed through the development of site-specific erosion and sediment control plans. ESCPs are developed by a suitably qualified person and in accordance with IECA BESC 2008. Pipeline operations and maintenance is undertaken in accordance with the APGA Code of Environmental Practice: Onshore Pipelines (as relevant). Arrow undertakes ecological impact assessments as a prerequisite for site access and prior to commencing significant land disturbance for all of Arrow's development activities. These assessments, including both desktop and/or field assessment as applicable, establish the ecological and biodiversity characteristics of areas that may be disturbed. The assessments are also used to identify site-specific ecological constraints and opportunities (e.g. sensitive ecological features, areas of high biodiversity value, ESAs, high value waters, weeds and pests, etc.), and management requirements to avoid, minimise or mitigate environmental harm associated with land disturbance activities. Assessments are used to inform site selection, site-specific management plans and procedures (fauna, flora, pest, etc.), future rehabilitation requirements and offsets where residual impacts remain.
Schedule E - Acoustic	HSE MS Standards Compendium - Amenity. Complaints Management System.	During site selection and prior to disturbance, construction or operational activities being undertaken, Arrow review and identify the locations of activities relative to locations of sensitive receptors, check required separation distances and EA specific noise limits permitted. Where necessary and appropriate noise modelling and/or monitoring is undertaken to ensure compliance with noise conditions.
Schedule F - Air	HSE MS Standards Compendium – air quality, greenhouse gas, amenity, venting and flaring. Complaints Management System.	Arrow undertakes air quality assessments to inform the development of air emissions criteria and undertakes monitoring as required. A register of fuel burning and combustion equipment is maintained. Dust suppression is a standard requirement of construction projects.
Schedule G - Waste	HSE MS Standards Compendium – waste, coal seam gas water	Wastes generated through Arrow's activities include: - General waste - commercial, domestic and recyclable wastes including glass, metal, cardboard plastic, and food scraps - Regulated waste - waste oil, oily water or soil, and oily rags, sewage effluent and the offsite disposal of CSG water, brine and residual drill material Arrow's waste management practices are guided by the waste and resource management hierarchy of avoid, reduce, re-use, recycle, recover, treat or dispose. Site waste management guides identify the types of waste, risks and management measures to be implemented, waste management practices and systems required and record keeping.
Schedule H - Rehabilitation	HSE Standards Compendium - Land Management	Arrow aims to minimise disturbance to vegetation, land, native flora and fauna and farmland and infrastructure (including crops, pastures and stock). Rehabilitation objectives are to facilitate the return of land to a stable state where either the former land use or another specified use as agreed with the State and landowner and in accordance with the EA conditions, can be resumed. Rehabilitation applies to stabilisation of operating areas, decommissioning and final closure rehabilitation to stabilise the land following decommissioning of infrastructure ego plugged and abandon wells, as follows: Stabilisation: where land disturbance is undertaken, Arrow ensures that sites are maintained in an appropriate stable condition following completion of construction activities. Stabilisation of disturbed areas is undertaken as practicable following land disturbance. Ongoing monitoring and maintenance is undertaken to ensure the site remains in a stable condition and site records document the areas, volumes, methods and locations.

EA Condition	Internal Process/Management System	Environmental Management Strategies
		Decommissioning: Following completion of activities infrastructure is decommissioned, and above ground infrastructure removed (subject to alternate arrangements being made with landowners and authorised under the EA). Site-specific decommissioning plans are developed as necessary for large infrastructure such as dams, and for pipeline and gathering networks. Final rehabilitation: sites are rehabilitated (including monitoring) to achieve final rehabilitation acceptance criteria, are non-polluting, provide a stable landform and can sustain the current use of the land with no further mitigation or management measures required beyond the normal management of the land.

Appendix A – Figures



Based on or contains data provided by the Qld Government. In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.

© Commonwealth of Australia (Geoscience Australia) year of publication. This material is released under the Creative Commons Attribution 2.5 Australia Licence. <http://creativecommons.org/licenses/by/2.5/au/>. The dimensions, areas, number of lots, size & location of corridor information are approximate only and may vary.

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no warranty is given that the information contained on this map is free from error or omission. Any reliance placed on such information shall be at the sole risk of the user. Please verify the accuracy of all information prior to using it.

Note: The information shown on this map is a copyright of Arrow Energy Limited and, where applicable, its affiliates and co-venturers.

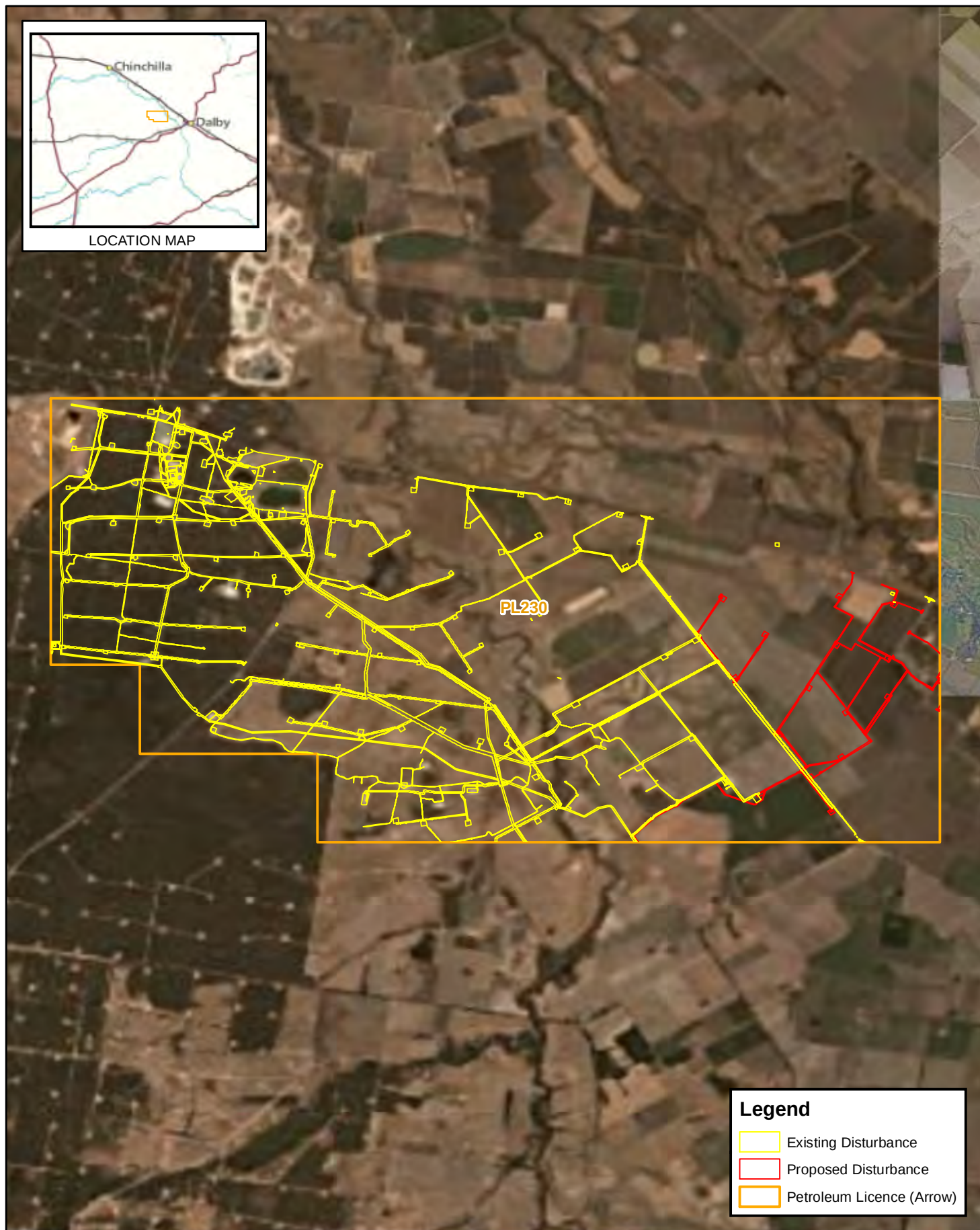
N

0 1.25 2.5 5 km

Coordinate System: GDA2020

Figure 1
Disturbance
PL198





Based on or contains data provided by the Qld Government. In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.

© Commonwealth of Australia (Geoscience Australia) year of publication. This material is released under the Creative Commons Attribution 2.5 Australia Licence. <http://creativecommons.org/licenses/by/2.5/au/>. The dimensions, areas, number of lots, size & location of corridor information are approximate only and may vary.

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no warranty is given that the information contained on this map is free from error or omission. Any reliance placed on such information shall be at the sole risk of the user. Please verify the accuracy of all information prior to using it.

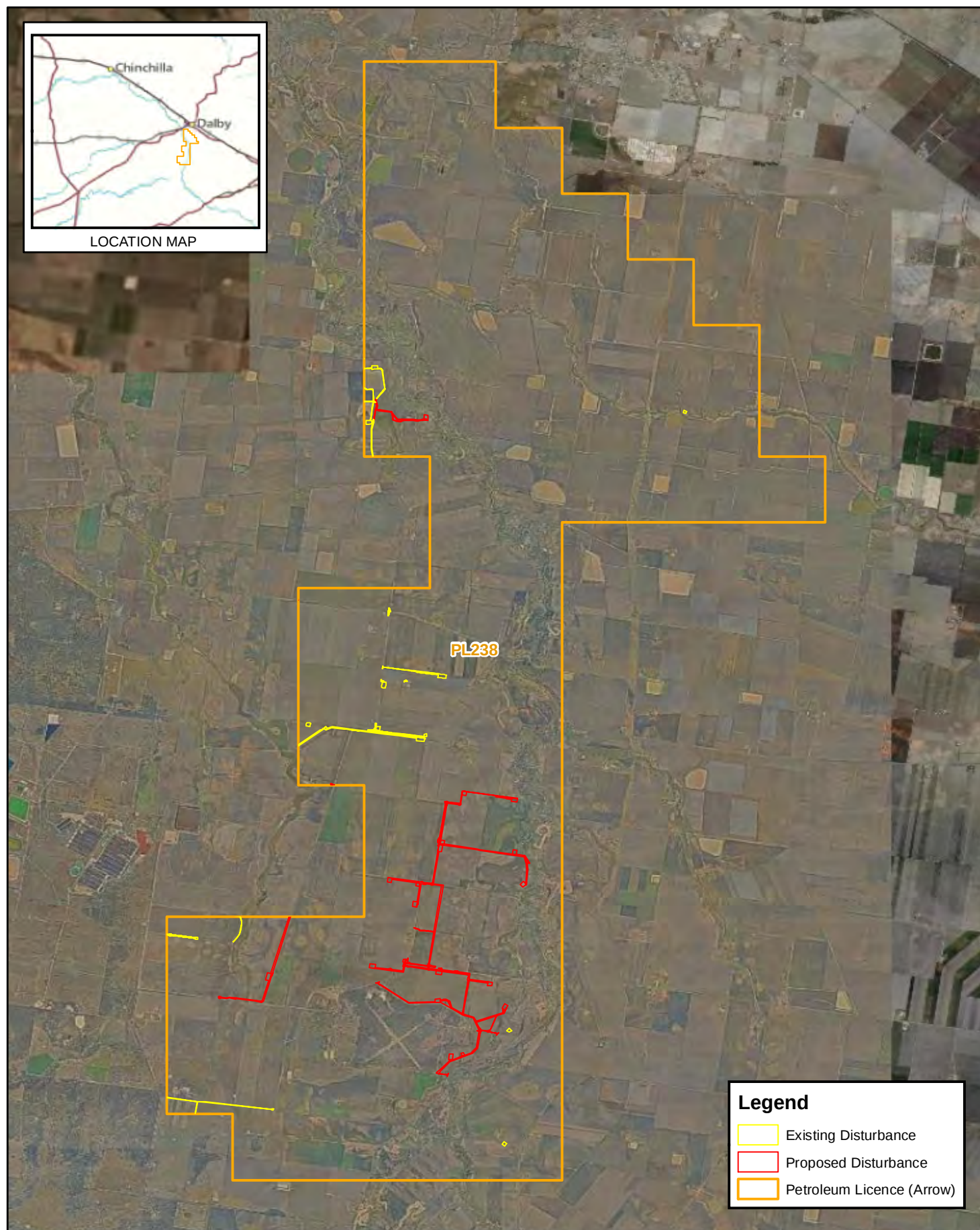
Note: The information shown on this map is a copyright of Arrow Energy Limited and, where applicable, its affiliates and co-venturers.

0 0.75 1.5 3 km

Coordinate System: GDA2020

Figure 2
Disturbance
PL230





Based on or contains data provided by the Qld Government. In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.

© Commonwealth of Australia (Geoscience Australia) year of publication. This material is released under the Creative Commons Attribution 2.5 Australia Licence. <http://creativecommons.org/licenses/by/2.5/au/>. The dimensions, areas, number of lots, size & location of corridor information are approximate only and may vary.

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no warranty is given that the information contained on this map is free from error or omission. Any reliance placed on such information shall be at the sole risk of the user. Please verify the accuracy of all information prior to using it.

Note: The information shown on this map is a copyright of Arrow Energy Limited and, where applicable, its affiliates and co-venturers.

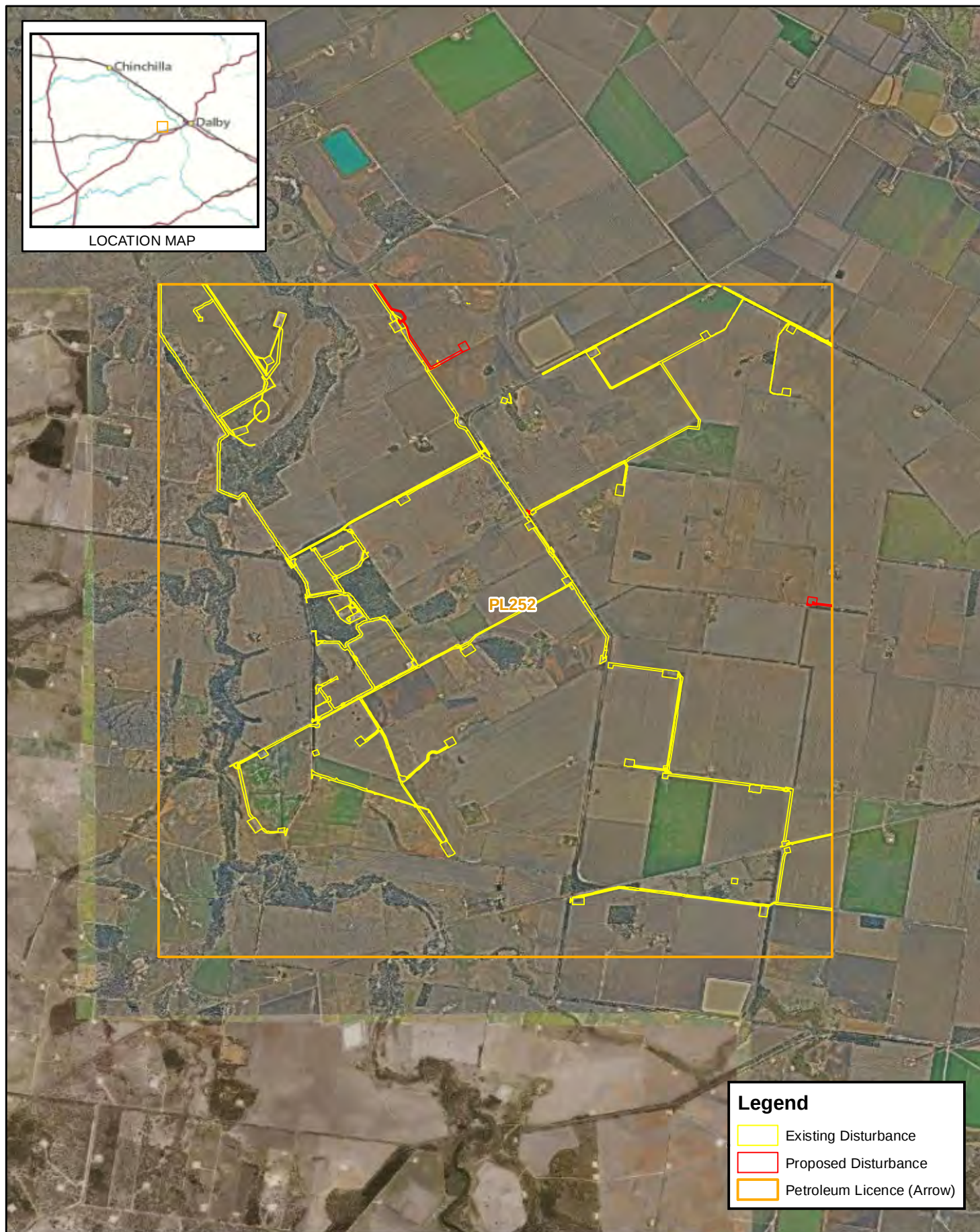
N

0 1 2 4 km

Coordinate System: GDA2020

Figure 3
Disturbance
PL238





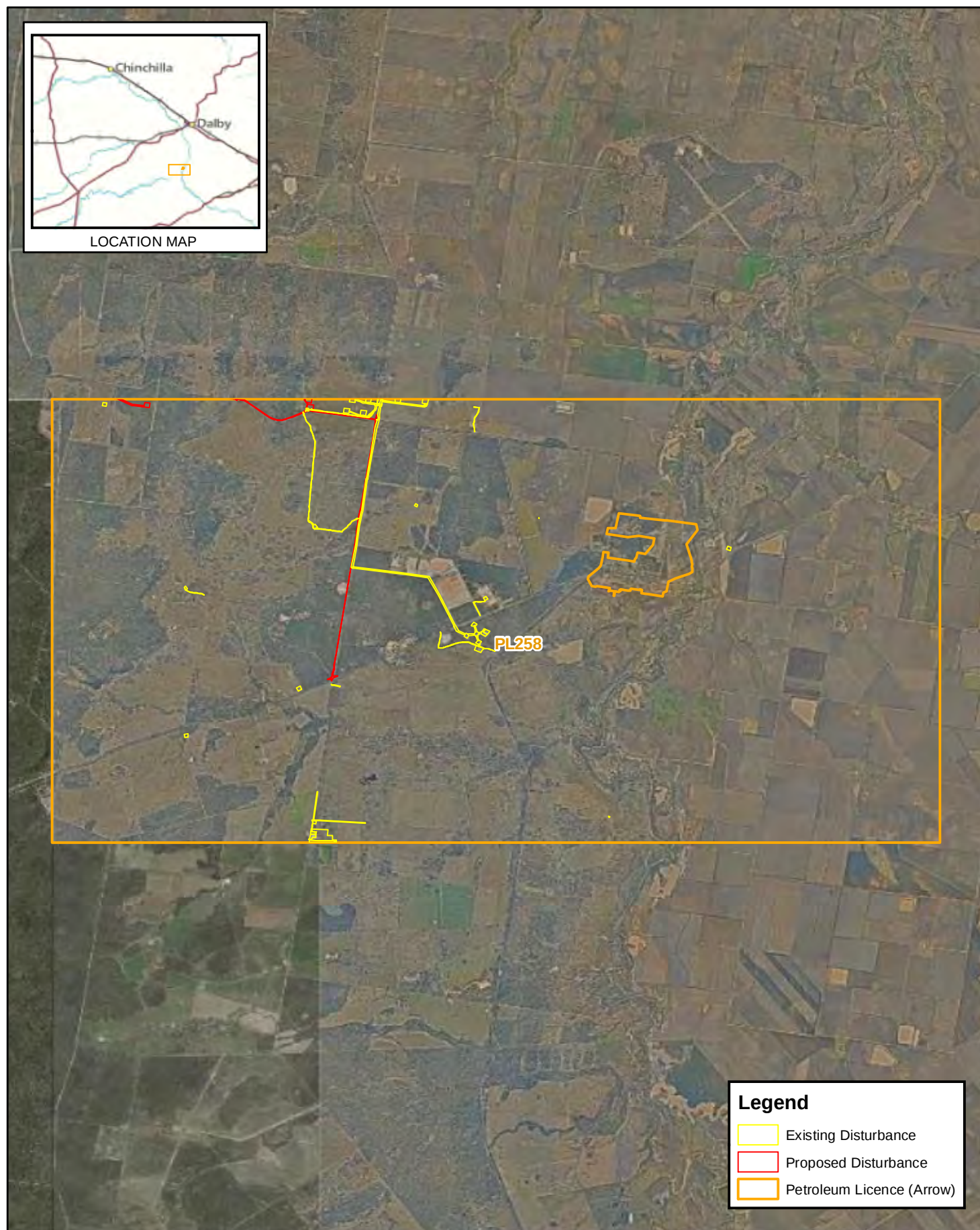
Based on or contains data provided by the Qld Government. In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.

© Commonwealth of Australia (Geoscience Australia) year of publication. This material is released under the Creative Commons Attribution 2.5 Australia Licence. <http://creativecommons.org/licenses/by/2.5/au/>. The dimensions, areas, number of lots, size & location of corridor information are approximate only and may vary.

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no warranty is given that the information contained on this map is free from error or omission. Any reliance placed on such information shall be at the sole risk of the user. Please verify the accuracy of all information prior to using it.

Note: The information shown on this map is a copyright of Arrow Energy Limited and, where applicable, its affiliates and co-venturers.

Figure 4
Disturbance
PL252



Based on or contains data provided by the Qld Government. In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.

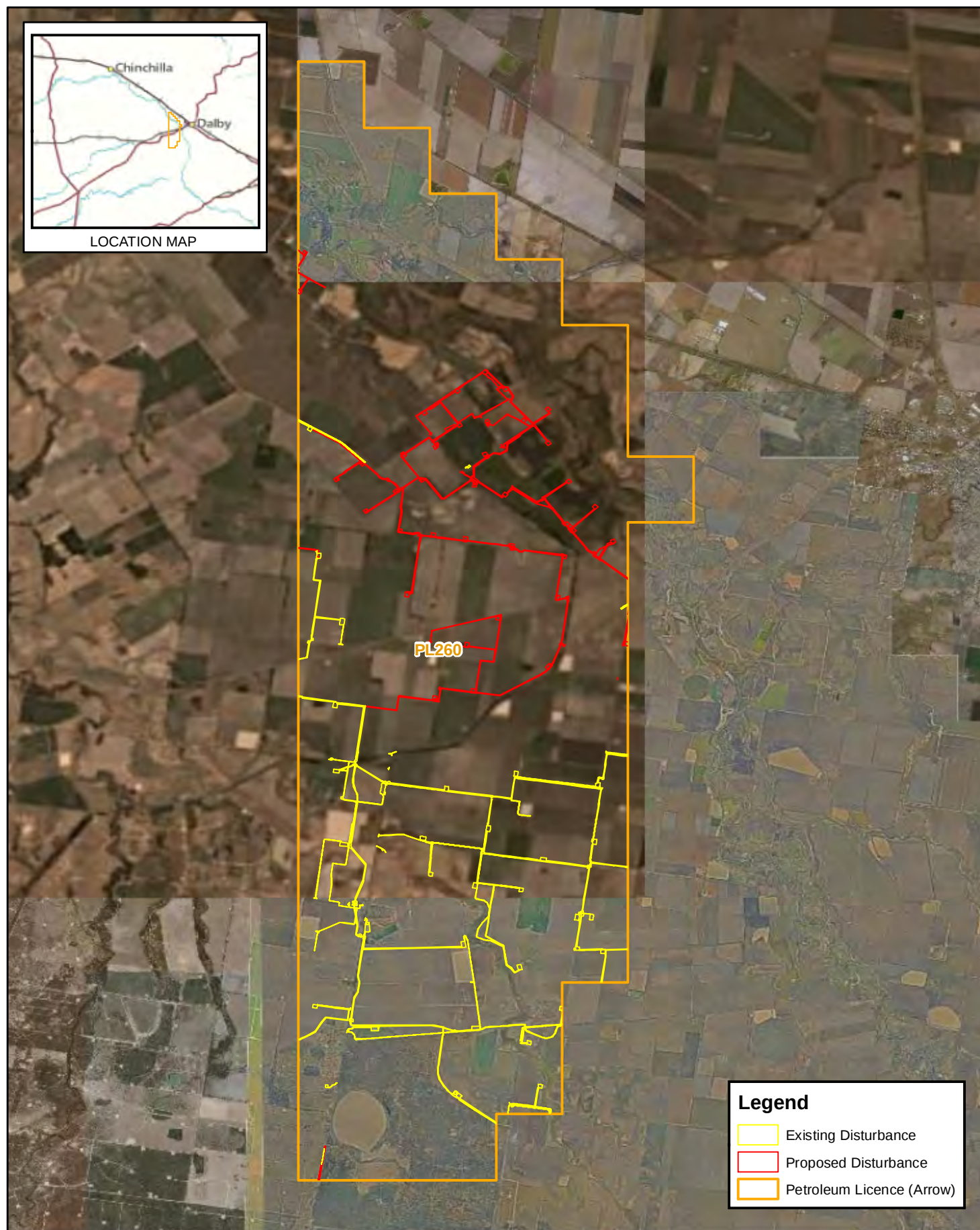
© Commonwealth of Australia (Geoscience Australia) year of publication. This material is released under the Creative Commons Attribution 2.5 Australia Licence. <http://creativecommons.org/licenses/by/2.5/au/>. The dimensions, areas, number of lots, size & location of corridor information are approximate only and may vary.

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no warranty is given that the information contained on this map is free from error or omission. Any reliance placed on such information shall be at the sole risk of the user. Please verify the accuracy of all information prior to using it.

Note: The information shown on this map is a copyright of Arrow Energy Limited and, where applicable, its affiliates and co-venturers.

Figure 5
Disturbance
PL258





Based on or contains data provided by the Qld Government. In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for direct marketing or be used in breach of the privacy laws.

© Commonwealth of Australia (Geoscience Australia) year of publication. This material is released under the Creative Commons Attribution 2.5 Australia Licence. <http://creativecommons.org/licenses/by/2.5/au/>. The dimensions, areas, number of lots, size & location of corridor information are approximate only and may vary.

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no warranty is given that the information contained on this map is free from error or omission. Any reliance placed on such information shall be at the sole risk of the user. Please verify the accuracy of all information prior to using it.

Note: The information shown on this map is a copyright of Arrow Energy Limited and, where applicable, its affiliates and co-venturers.

N

 0 1 2 4 km
 Coordinate System: GDA2020

Figure 6
Disturbance
PL260

