REGIONAL INTEREST DEVELOPMENT APPLICATION ASSESSMENT REPORT LEGBAR PPL2064

Prepared for: Santos Ltd

T29

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BASIS OF REPORT

This report has been prepared by T29 Holdings Pty Ltd (T29) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Santos Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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DOCUMENT CONTROL

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Abbreviations

The following abbreviations are used throughout this Supporting Information Report.

Acronym	Description
ATP	Authority to Prospect
BIM	Block Identification Map
BPEM	Best Practice Environmental Management
DEHP	Department of Environment and Heritage Protection, Queensland
DES	Department of Environment and Science, Queensland
EA	Environmental Authority
EO Act	*Environmental Offsets Act 2014*
EP Act	*Environmental Protection Act 1994*
EP Reg	*Environmental Protection Regulation 2008*
EPP	*Environmental Protection Policy 2008*
ERA	Environmentally Relevant Activities
ESA	Environmentally Sensitive Area
GES	General Ecological Significance
ha	Hectares
IEMS	Integrated environmental management system
km	Kilometre
LC	Least Concern
m	Metres
MSES	Matters of State Environmental Significance
N/A	Not Applicable
NCA	*Nature Conservation Act 1992*
NCAP	No Concern at Present
PJ	Petajoule
PL	Petroleum Lease
PMST	Commonwealth Protected Matters Search Tool
PPL 2064	Petroleum Pipeline Licence 2064
RE	Regional Ecosystem
RoW	Right of Way
SEA	Strategic Environmental Area
SMP	Site Management Plan
SMS	Santos Management System

1 Introduction

1.1 Overview

Santos Limited (Santos) is the applicant for a new petroleum pipeline licence (PPL) 2064 known as the Legbar 1 Flowline. PPL 2064 is a point-to-point PPL from the Legbar 1 petroleum well in ATP 934, to an existing petroleum well (Bantam 1) in ATP 1189 in the Cooper Basin, south-west Queensland (Figure 1).

PPL 2064 is located within the Channel Country strategic environmental area (SEA) prescribed under the *Regional Interests Planning Regulation 2014* (RPI Reg). Prescribed SEAs are identified as 'areas of regional interest' under section 7 of the *Regional Interests Planning Act 2014* (RPI Act). A regional interest development approval (RIDA) issued under section 53 of the RPI Act is required in order to carry out a resource activity within an 'area of regional interest'.

Santos has prepared this assessment report to support an assessment application for a RIDA. This RIDA proposes to construct and operate 5.5 km of gas flowline on PPL 2064 within the Channel Country SEA.

The assessment report has been prepared in accordance with the RPI Act Statutory Guideline 01/14: *How to make an assessment application for a regional interests development approval under the RPI Act and the RPI Act Statutory Guideline 05/14: Carrying out resource activities and regulated activities within a Strategic Environmental Area*.

This assessment report provides the following:

- Description of the proposed activities
- Identification of the relevant environmental attributes of the land subject to the application
- Evaluation of the potential impacts on the identified relevant environmental attributes
- An assessment of how the proposed activities meet the required outcome for SEA as detailed in the RPI Reg.

1.2 Applicant and related approvals

Santos is the applicant for PPL 2064 and associated Environmental Authority, and is therefore an *eligible person* under s28 of the RPI Act.

1.3 Non-notifiable application

In accordance with Section 34(2) of the RPI Act, and Section 13 of the RPI Reg, notification of the assessment application is not mandatory, as the activities are not proposed to be carried out in an area of regional interest that is a priority living area.

The proposed activities within the SEA are located on entirely on the Durham Downs Pastoral Station (Lot 1 on Plan SP133822). Discretionary notification under s34(4) would not be necessary given that

separate regulatory systems are in place that require Santos to notify the landholder of petroleum activities occurring within their properties, the very large size of the cattle station relative to the activities, and that the landholder will receive a copy of the application as described below.

1.4 Landholder copy of the application

In accordance with Section 30 of the RPI Act and Schedule 5 of the RPI Reg, a copy of the application will be given to the landowner within 5 business days after the application is made.

1.5 Referable application

In accordance with Section 12(2) and Schedule 1 of the RPI Reg, the application is referrable to the Department of Environment and Science (DES) and the Department of Resources (DoR).

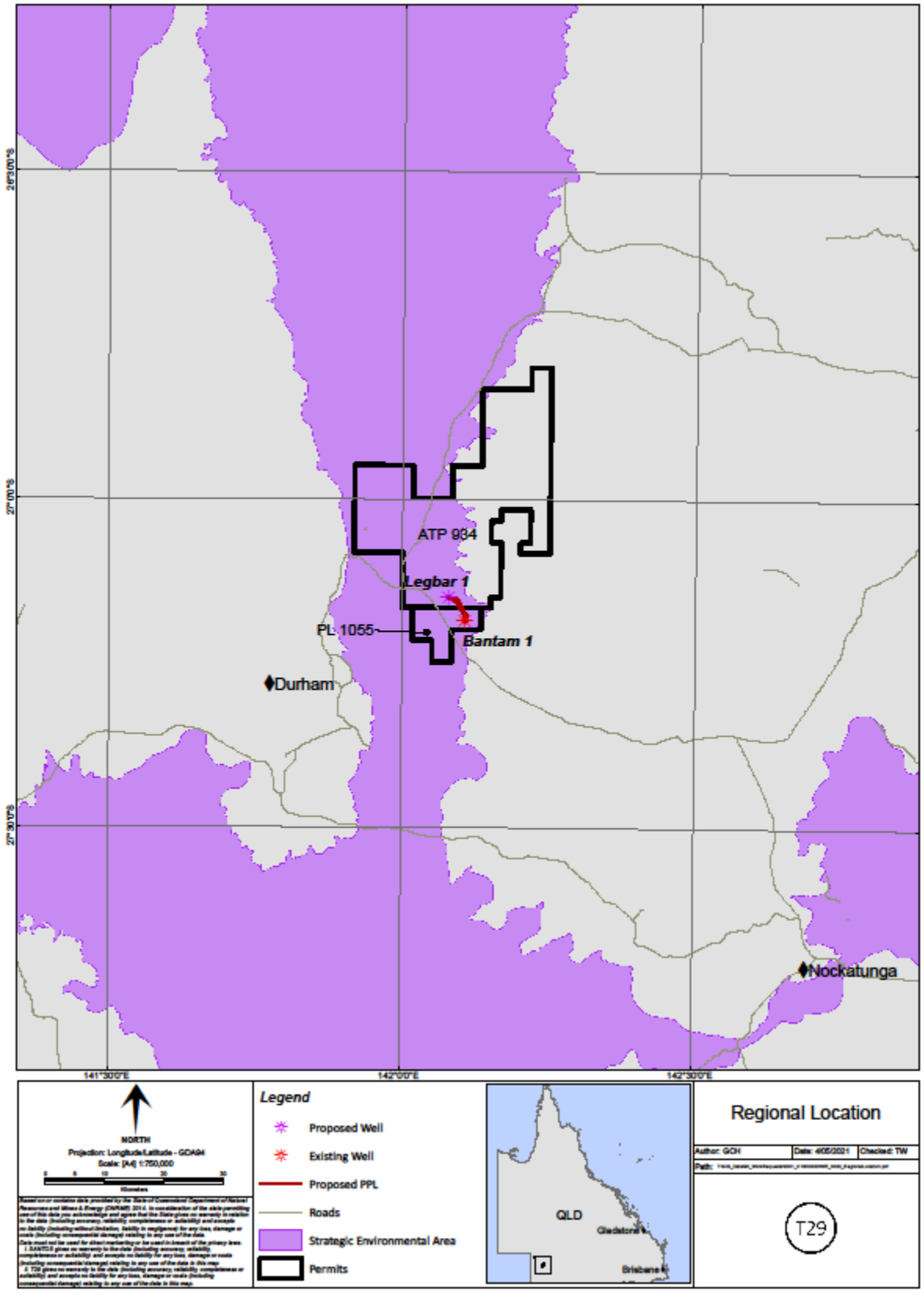

Figure 1 PPL 2064 location

2 Proposed activity – PPL 2064 Legbar

2.1 Description of activities

The proposed PPL 2064 flowline is a south-east to north-west running, buried pipeline approximately 5.5 km kilometres in length. The flowline has been sited to reduce overall length and therefore disturbance, avoid large areas of cultural heritage exclusion zones and co-locate with existing infrastructure (i.e. fence line). The flowline is entirely located within the Channel Country SEA.

The flowline will be constructed in compliance with the eligibility criteria and standard conditions for petroleum pipeline activities. Construction activities would occur within a right of way (RoW) width on average 15 m wide and include:

- clearing and grading the route
- transporting and laying out piping sections
- trenching and padding
- stringing, laying and welding pipe within trench
- backfilling the trench.

The flowline would include two mid-line risers and pigging facilities. The pigging facilities will be co-located on the well pads. The final location of the pipeline may shift slightly within a construction disturbance zone because of cultural heritage, engineering and environmental constraints; however, the overall disturbance area will not change.

Following completion of construction, the construction corridor would be rehabilitated to an operational right-of-way approximately three metres wide. This would involve reinstating topsoil and establishing self-sustaining groundcover consistent with surrounding undisturbed land and absent of declared pest species.

During operation, gas from the Legbar 1 well would flow to the Bantam 1 well (ATP 1189) and into an existing flowline which connects into the Santos operated Tartulla Petroleum lease (PL 1054).

Following cessation of petroleum activities, the flowline would be rehabilitated in accordance with the PPL EA conditions.

2.2 Construction methodology

2.2.1 Construction

The RoW width comprises the topsoil bank on either side of the ROW, access for the pipe truck and side boom tractor/excavator, the flowline trench, and a trench spoil bank.

The length of the flowline through the SEA is 5.5 km.

Once the flowline is laid within the trench, it would be bedded with padding placed around it, backfilled and compacted. The ROW would then be reinstated to the condition and profiles existing at the commencement of activities. All wheel and equipment ruts along the flowline route would be filled in and levelled by grading. Topsoil and seed stock removed during installation would be re-spread over the ROW and windrows removed. Where seed stock has not been displaced during installation, the area would be lightly scarified to promote regrowth.

Above ground infrastructure will include two mid-line risers and pigging facilities. The pigging facilities will be co-located on the well pads at either end of the flowline.

2.2.2 Operation

Pipeline maintenance activities, such as pigging, and inspections would also be carried from time to time. The flowline would be decommissioned at end-of-life in accordance with the *Petroleum and Gas (Production and Safety) Act 2004* (P&G Act 2004) and the relevant EA conditions.

3 Environmental Attributes and Potential Impacts

Section 7 of the RPI Reg prescribes the following environmental attributes relevant to the Channel Country SEA:

a) the natural hydrologic processes of the area characterised by-

   i. natural, unrestricted flows in and along stream channels and the channel network in the area; and

   ii. overflow from stream channels and the channel network onto the flood plains of the area, or the other way; and

   iii. natural flow paths of water across flood plains connecting waterholes, lakes and wetlands in the area; and

   iv. groundwater sources, including the Great Artesian Basin and springs, that support waterhole persistence and ecosystems in the area;

b) the natural water quality in the stream channels and aquifers and on flood plains in the area;

c) the beneficial flooding of land that supports flood plain grazing and ecological processes in the area.

DSDMIP's RPI Act Statutory Guideline 05/14: Carrying out resource activities and regulated activities within a Strategic Environmental Area summarises the above attributes to broadly relate to:

- Riparian process
- Wildlife corridors
- Water quality
- Hydrologic processes
- Geomorphic processes
- Beneficial flooding.

The relevance of the above environmental attributes to the proposed activities is described below.

3.1 Land Use

The Durham Downs Pastoral Station (Lot 1 on Plan SP133822) is a pastoral lease that operates as a cattle station with a capacity of up to 21,500 head of cattle[1]. The primary land uses are cattle grazing and petroleum activities. Sections of the pastoral leases have been subject to long-term grazing from pastoral operations.

[1] S. Kidman & Co Ltd (2018) Durham Downs, https://www.kidman.com.au/locations/durham-downs/ Accessed 05/02/21.

3.2 Climate

The Channel Country SEA is in an arid to semi-arid region of central Australia where the average rainfall is low. Seasons in the area are characterised by dry, hot summers and short, very dry winters as shown on Figure 2. Climate data from a nearby weather station (Ballera Gas Field (Station Number 045009) shows that the mean rainfall for the project area from 2000 - 2019 is 181.8 mm/year. The mean number of days of rain more than or equal to 1 mm is 20.1 days/year; that is on average, the project area can expect approximately 344 days each year of less than 1 mm of rainfall. The El-Nino Southern Oscillation (ENSO) exerts significant influence on inter-annual climate variability across the area, producing marked fluctuations in the amount, timing and distribution of rainfall. As such, there is considerable year-to-year variation, particularly during the summer months, ranging from 'failed' wet seasons, to 'normal' and above average rainfall and tropical cyclone activity.

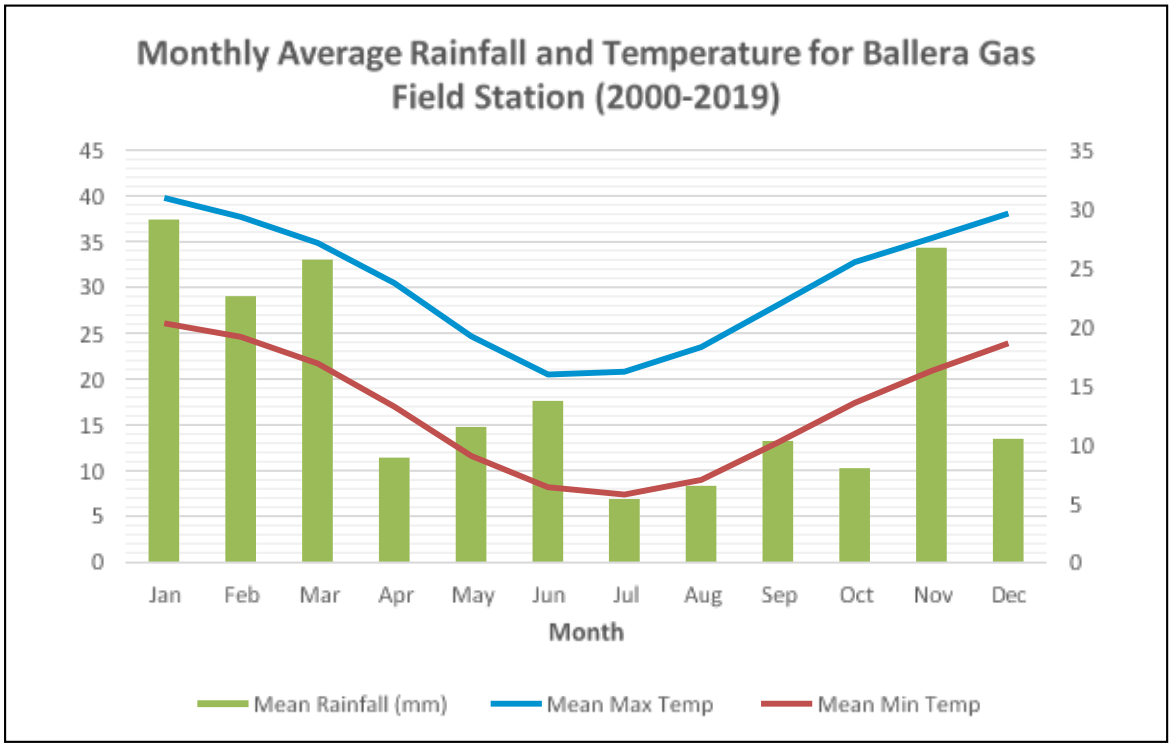

Figure 2 Monthly Average Rainfall and Temperature for Ballera Gas Field Station (2000-2019)

3.3 Relevant environmental values

The proposed activity would comply with the standard conditions for petroleum pipelines with the exception of conditions PPSCB 4 where it is located within the administrative boundary of the Channel Country SEA. Environmental attributes of the Channel Country SEA are identified in section 7 of the *Regional Planning Interests Regulation 2014* and include:

a) the natural hydrologic processes of the area characterised by—
   i. natural, unrestricted flows in and along stream channels and the channel network in the area; and

ii. overflow from stream channels and the channel network onto the flood plains of the area, or the other way; and
iii. natural flow paths of water across flood plains connecting waterholes, lakes and wetlands in the area; and
iv. groundwater sources, including the Great Artesian Basin and springs, that support waterhole persistence and ecosystems in the area;

b) the natural water quality in the stream channels and aquifers and on flood plains in the area;
c) the beneficial flooding of land that supports flood plain grazing and ecological processes in the area.

The Department of Infrastructure, Local Government and Planning's (DILGP) RPI Act Statutory Guideline 05/14 states that these attributes broadly relate to:

- riparian processes
- wildlife corridors
- water quality
- hydrologic processes
- geomorphic processes
- beneficial flooding.

These attributes (and related values including regional ecosystems, environmentally sensitive areas, protected plants and animals, surface waters and wetlands, land resources and Matters of State Environmental Significance) are considered the primary environmental values for this EA application.

While the EA application only seeks to remove condition PPSCB 4, for completeness, the following additional environmental values have been considered:

- air and noise
- waste
- rehabilitation.

Given the proposed activity is for a pipeline and would not impact on groundwater, and no particular cultural heritage values within PPL 2064 have been identified, these values have not been considered further.

3.3.1 Riparian processes and regional ecosystems

Regional Ecosystem (RE) mapping and aerial photography indicate that vegetation present within the project area is typical of the elsewhere in the bioregion (Channel Country) and subregions (Cooper - Diamantina Plains and Sturt Stony Desert) - dominated by tussock grasslands and forblands through the centre of ATP 1189, with large sections of wetlands to the west and other acacia dominated open forests, woodlands and shrublands to the east. REs present are widespread and commonly present across the Cooper Creek catchment area. Vegetation within area has been subject to long- term cattle grazing from the operation of pastoral stations.

REs mapped to be present within area is shown in Figure 3 and detailed in Table 1. All REs are listed as No Concern at Present (NCAP). The proposed activities are entirely located within NCAP REs.

There are no other mapped Environmentally Sensitive Areas (ESAs) present within or surrounding the tenure area. The proposed activities will not be undertaken within areas mapped as essential habitat.

Table 1 Regional Ecosystems Descriptions

RE Code	RE Short Description	VM Act Class	BD Status	Structural Category
5.3.13a	*Duma florulenta* open shrubland in depressions on flood plains, interdune flats, clay pans and clay plains.	LC	NCAP	Very Sparse
5.3.16b	*Eragrostis australasica* sparse tussock grassland on intermittently inundated depressions on flood plains, interdune flats, clay pans and clay plains.	LC	NCAP	Very Sparse
5.3.18b	Braided channel complex of major alluvial plains, includes *Chenopodium auricomum* open shrubland and variable sparse to open-herbland.	LC	NCAP	Sparse
5.3.21a	Variable sparse to open herbland, *Senna spp*. open shrubland and bare scalded areas on infrequently flooded alluvia of major rivers their distributaries, drainage channels and creeks.	LC	NCAP	Sparse
5.3.7	*Eucalyptus coolabah +/- Lysiphyllum gilvum +/- Acacia stenophylla +/- Acacia cambagei* low open woodland on major channels.	LC	NCAP	Very Sparse
5.3.8a	*Eucalyptus coolabah* low open woodland +/- *Duma florulenta* on braided channels, drainage lines, flood plain lakes and claypans.	LC	NCAP	Very Sparse

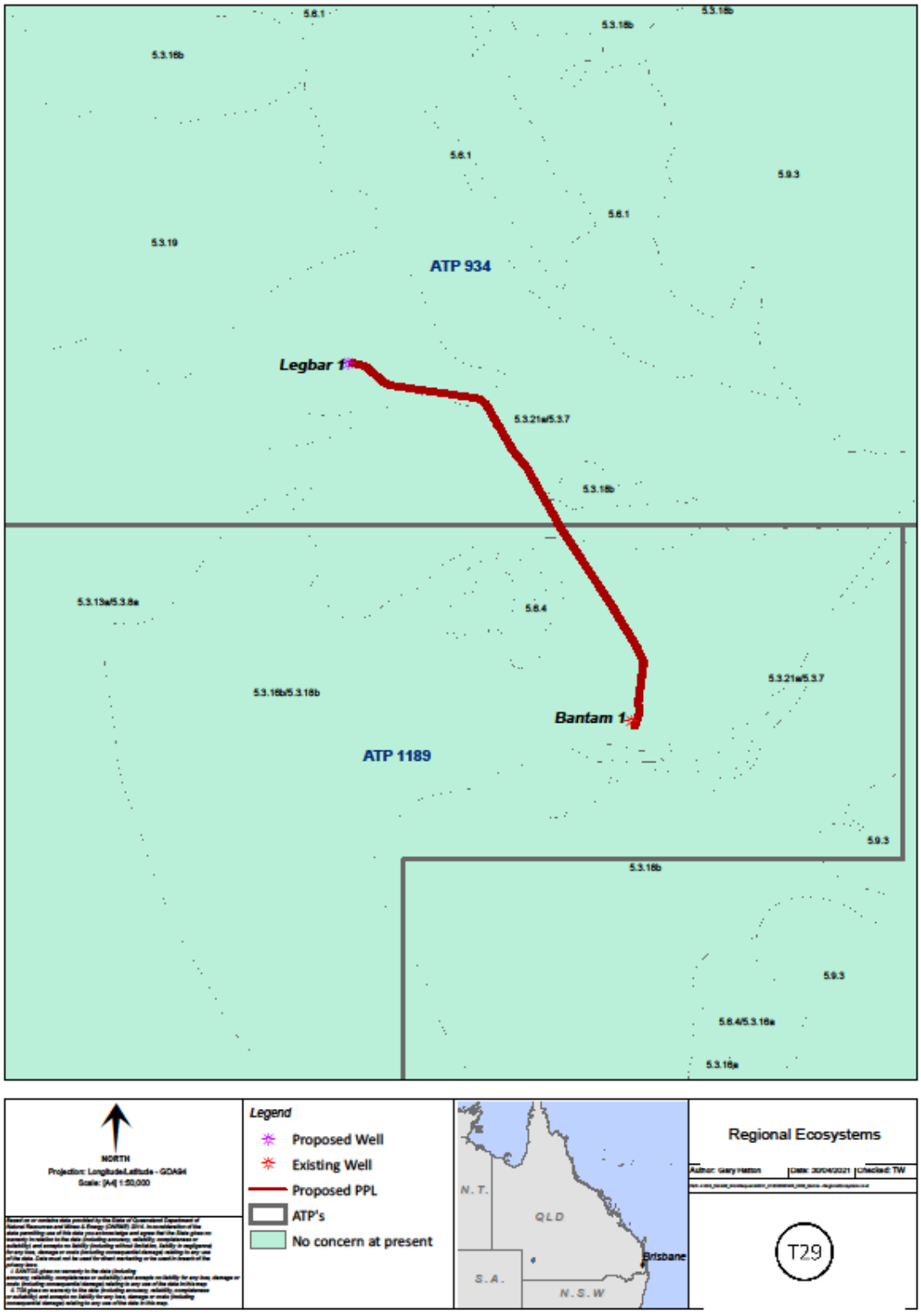

Figure 3 Regional Ecosystems

3.3.2 Wildlife Corridors and protected flora and fauna

Figure 4 shows state and regional riparian and terrestrial corridors as per DES Biodiversity Planning Assessments and Aquatic Conservation Assessments environmental reports.

Riparian corridors identified within these environmental reports are based upon major channels (250k geodata hierarchy 1) and minor channels (250k geodata hierarchy 2 and 3) necessary to capture permanent waterholes, buffered by 1 km either side and clipped to land zone 3[2]. Terrestrial corridors identified within these environmental reports are based upon major themes of habitat connectivity across the bioregion. It includes the north/south and east/west links that cover areas characterised by a relative continuity of similar or related habitat.

The proposed flowline will cross a mapped riparian corridor.

The proposed flowline is not within an area identified as essential habitat on the essential habitat map for an animal or plant that is endangered or vulnerable wildlife, or an area shown as a high-risk area on the flora survey trigger map.

There is potential for endangered, vulnerable or special least concern animal wildlife habitat to occur along the proposed flowline route. A species list was generated from the WildNet database for a 50 kilometre radius of the proposed flowline. The list included records of one vulnerable species and one near threatened species listed under the *Nature Conservation Act 1992:*

- grey falcon (*Falco hypoleucos*)
- grey grasswren (*Amytornis barbatus*)

Habitat for the above species, or other endangered or vulnerable species, or special least concern animals not previously recorded, may exist along the flowline route.

[2] DERM 2009 *Biodiversity Planning Assessment, Channel Country Bioregion, Landscape Expert Panel Report, Version 1.1*

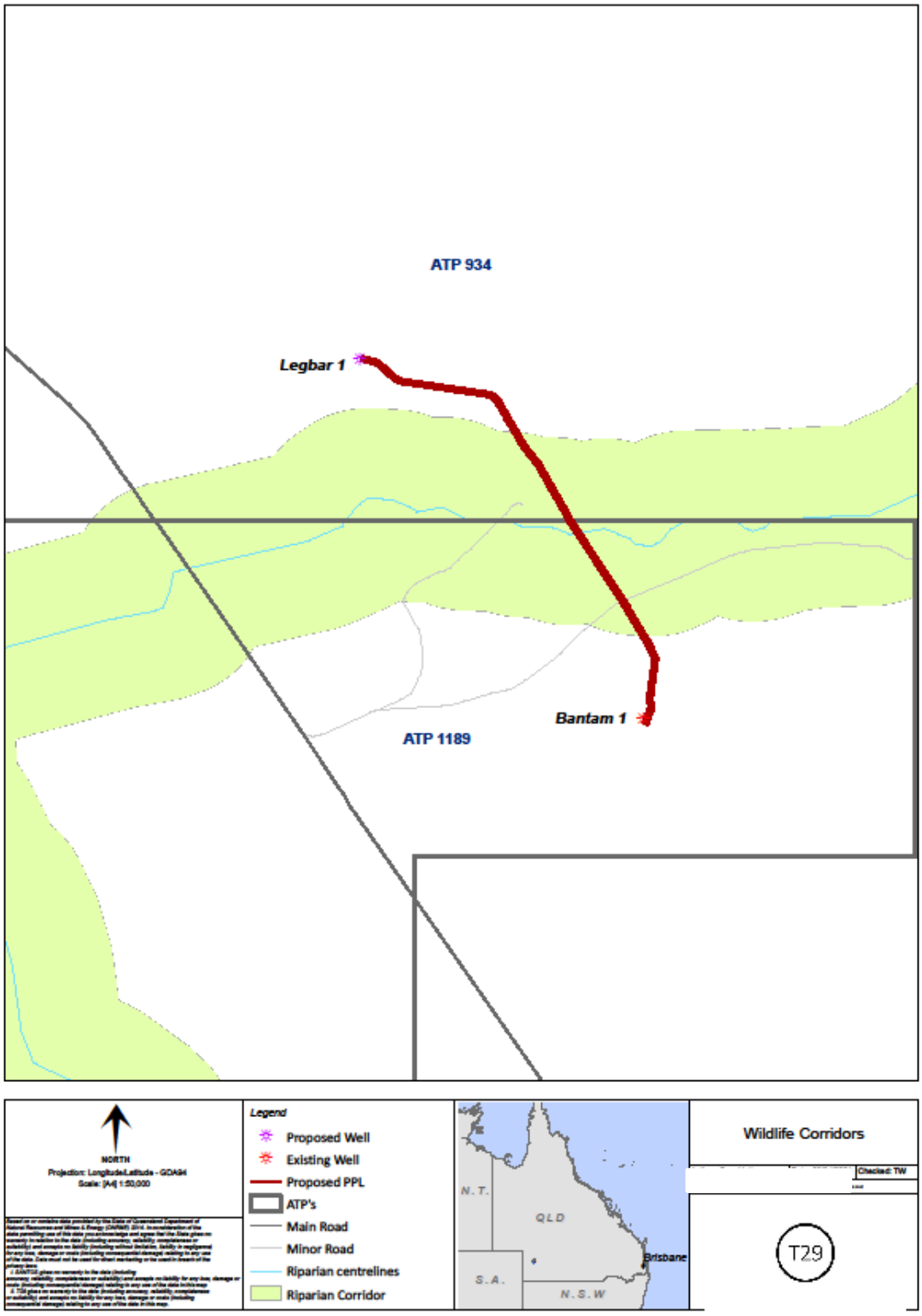

Figure 4 State and Regional Biodiversity Corridors

3.3.3 Surface water and wetlands

The proposed flowline is located in the Cooper Creek catchment area will traverse 5 DNRME mapped streams (Figure 5). The drainage system is dominated by the Cooper Creek Basin draining towards Lake Eyre. During periods of high rainfall, the flat topography and drainage channel system becomes a largely flooded plain with water flow concentrating where Cooper Creek crosses the QLD-SA border.

The Cooper Creek system catchment covers an area of approximately 300,000 km^2. Generally, Cooper Creek streamflow is confined to the main channels, but every 3-4 years, flows are sufficient to inundate parts of the Cooper floodplain via a network of tributary channels. During extended periods of no flow, the Cooper Creek contracts to a series of waterholes. Very large Cooper Creek flood events with the potential to inundate the broader Channel Country region, and flow water into the lower Cooper Creek in South Australia, occur on average once every 10 years, reaching Lake Eyre North in an estimated 1 in every 20 years. As discussed above, the pipeline alignment is located outside recent flood events.

While there is limited water quality data available for Cooper Creek, the data that is available indicates water quality is likely subject to local influence and conditions vary between flood times and periods of no-flow (Smith et al. 2016). Electrical conductivity (EC) levels, while normally low and stable, tend to increase during low or no-flow periods and sharply decrease following inundation (Smith et al. 2016). Turbidity is generally high but varies subject to local influences (Smith et al. 2016). Turbidity decreases from upstream to downstream and then increases again before the Cooper Creek crosses the Queensland–SA border (Smith et al. 2016; Karim et al. 2015).

Historical (1965-2016) water quality data from the QLD Government's Cooper Creek gauging station 003103A, located approximately 99 kilometres south west, is summarised in Table 2.

Table 2 Cooper Creek Surface Water Quality (1956-2016)

Parameter	Average Value
Conductivity @ 25ºC	345 µS/cm
Turbidity	512 NTU
pH	7.4
Total Nitrogen	1.4 mg/L
Total Phosphorus as P	0.4 mg/L
Sodium as Na	44.6 mg/L
Magnesium as Mg	7.4 mg/L
Chloride as Cl	62.6 mg/L
Fluoride as F	0.2 mg/L

3.3.4 Land resources and geomorphic processes

Regionally, surface geology is dominated by Quaternary alluvium deposits associated with floodplains, with consolidated Tertiary sediments or Winton Formation on the higher ground. Cooper Creek is a large sedimentary sump accreting over a vast floodplain.

According to Regional Ecosystem mapping, the dominant land zone traversed by and surrounding the proposed flowline is Land Zone 3 (alluvial river and creek flats including closed depressions, paleo-estuarine deposits currently under freshwater influence, inland lakes and associated wave-built lunettes).

The dominant soil around the proposed Legbar PPL is CC88 (Figure 6): Clay plains marginal to major rivers and not channelled to the same extent as unit CC87; subject to seasonal inundation for the greater part; some sand dune and sand-hill areas: chief soils are grey clays (Ug5.24) but brown clays (Ug5.3) may occur also. There are (Uc1.2) soils on dunes and sand-hills, while other soils (undescribed) may occur on the flanks of the sandy areas.

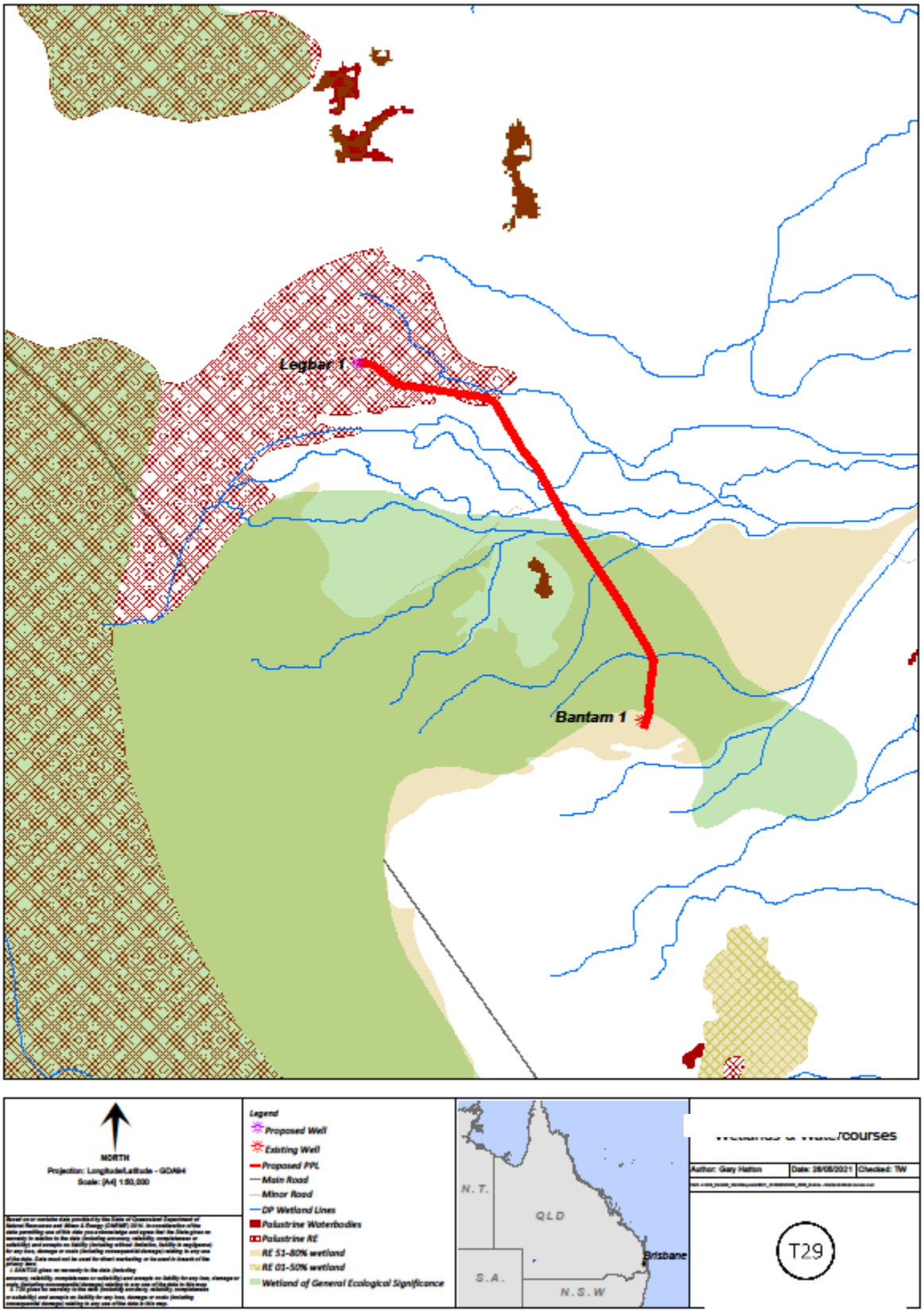

Figure 5 Watercourses and Wetlands

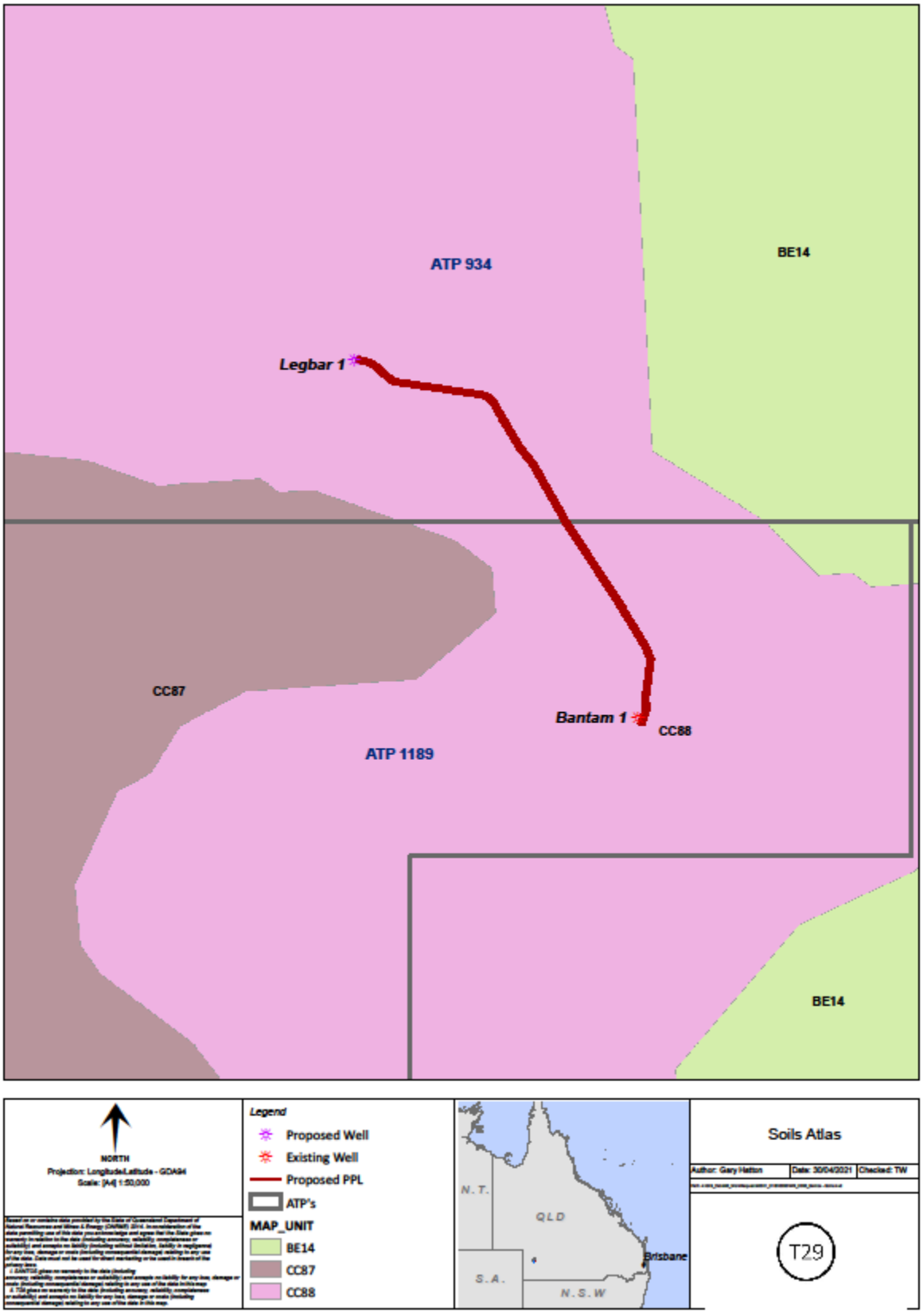

Figure 6 Soils

4 Impact assessment

The proposed flowline would have a total initial (construction) disturbance area of approximately 8.5 ha within the administrative boundary of the SEA. Following completion of construction, the right-of-way would be rehabilitated to reinstate groundcover consistent with surrounding undisturbed land and to reduce the operational width to three metres (1.65 ha).

4.1 Surface waters and wetlands

4.1.1 Water quality

Vegetation removal and earthworks during construction of the flowline may increase the erosion potential of the site, which in turn could increase sedimentation of surrounding waterways. The DNRME vegetation management watercourse and drainage feature map identified that four stream order 4 features and one stream order 5 feature will be crossed by PPL 2064. A survey conducted by E2M (March 2021) of the underlying ATP 1189 (Bantam) found that the watercourses are minor with a size that is reflective of a stream order 1.

The flowline has been sited to co-locate with existing infrastructure (i.e., fence line) and reduce overall length and therefore disturbance whilst avoiding large areas of cultural heritage exclusion zones. To further reduce disturbance levels and erosion potential of the site, Santos would commence rehabilitation as soon as reasonably practicable following the cessation of activities.

Work programs in floodplains/riparian/water crossing areas will be scheduled to take into account seasonal conditions and rainfall/flood likelihood. The pipeline construction will be conducted in the following preferential order:

(a) firstly, in times where there is no water present;

(b) secondly, in times of no flow; and

(c) thirdly in times of flow, but in a way that does not impede low flow

Any fuels / chemicals used on site will be stored and handled in accordance with Australian Standards and spill kits will be located onsite where required to contain any spills should they occur. All waste materials and non-essential infrastructure will be removed at the end of the petroleum activities as soon as reasonably practicable, minimising risks associated with contamination, or a reduction in water quality, in accordance with EA conditions. Rehabilitation to promote conditions suitable for the natural revegetation of disturbed areas will occur progressively.

Contingency measures for unplanned releases of contaminants will be implemented in accordance with EA conditions.

4.1.2 Hydrological processes and beneficial flooding

The proposed activity is unlikely to effect existing hydrological processes and beneficial flooding given its small footprint. The proposed flowline would be buried underground and the surface rehabilitated following construction to reinstate natural drainage patterns.

Following cessation of petroleum production, the flowline right-of-way would be rehabilitatedto promote the natural re-establishment of vegetation consistent to the surrounding undisturbed land.

4.1.3 Riparian processes, regional ecosystems

The proposed flowline is within riparian corridors, wetlands and watercourses, however the alignment would require minimal vegetation clearing given the sparse or very sparse structure of the vegetation communities present. The REs present within and near the disturbance footprint are naturally ephemeral and resilient to disturbance having adapted to the boom-and-bust periods associated with the Channel Country Bioregion. Given their sparse structure, they are likely to respond well to rehabilitation under appropriate conditions.

The PPL 2064 alignment proposes to approximately disturb the following mapped REs:

- 5.3.13a / 5.3.8a – 2.5 ha
- 5.3.21a / 5.3.7 – 2.5 ha
- 5.3.16a / 5.3.18a – 3.5 ha

The REs mapped as present have >99% of their pre-clear extent mapped for the underlying tenures in the 2017 remnant mapping. This indicates the level of historic vegetation clearing for replacement land in the locality is minimal and any additional clearing required for the proposed activity will not significantly reduce the area of occupancy of the existing RE vegetation. As such, the proposed flowline is unlikely to compromise riparian function or critically impede the use of the riparian vegetation for migration, shelter and habitat associated with watercourses.

In addition, Santos would implement the following measures to ensure that the proposed flowline does not compromise riparian processes:

  - Vegetation disturbance would be minimised as far as practicable including lopping/trimming branches rather than removing mature trees and shrubs where practicable
- The width of the corridor would be restricted to the smallest extent practicable in watercourse crossings.
- Chemicals and fuels would be stored and handled in accordance with Australian Standards and spill kits would be located onsite to contain any spills if required.
- Access to and from the flowline would occur along the three-metre operational right-of-way.
- The flowline right-of-way would be rehabilitated to the minimum width required for operations on completion of construction. This would aim to promote the natural re-establishment of vegetation of similar species composition and density to the surrounding undisturbed land in accordance with EA conditions.
- Following cessation of petroleum activities, the flowline right-of-way would be fully rehabilitated in accordance with EA conditions.

4.2 Wildlife corridors and protected flora and fauna

Potential impacts to protected flora and fauna species during construction of the flowline would include:

- removal of potential habitat for species
- fauna strike from machinery or vehicles
- fauna entrapment in trenches
- disturbance to fauna from noise.

These impacts, if eventuated, would be minor in nature and temporary in duration and are unlikely to result in significant impacts to protected flora and fauna species.

Measures would be adopted to prevent fauna entrapment in excavation work areas, including:

- Pipes capped to prevent fauna entrapment during construction or after abandonment
- Minimising the period trenches remain open to as short as reasonably practicable
- Regular inspections of open trenches and prior to backfilling
- Provision of escape ramps for fauna that do enter trenches.

4.3 Land resources and geomorphic processes

As discussed in section 4.1, the proposed activity may increase the erosion potential of the site during construction. This is considered unlikely to significantly affect geomorphic processes of the SEA given the minor area of proposed disturbance, and the temporary nature of construction.

Following completion of construction, the flowline right-of-way would be rehabilitated to three metres for ongoing operations. Rehabilitation would aim to reinstate the natural drainage features, and promote vegetation consistent with the surrounding undisturbed land such that natural erosion, sedimentation and depositional processes are maintained in the long- term.

4.4 Rehabilitation

Following cessation of petroleum activities, the flowline would be rehabilitated to meet the following final acceptance criteria:

- any contaminated land (e.g. contaminated soils) is remediated and rehabilitated
- rehabilitation is undertaken in a manner such that any actual or potential acid sulfate soils on the area of significant disturbance are treated to prevent or minimise environmental harm in accordance with the Instructions for the treatment and management of acid sulfate soils (2001)
- groundcover, that is not a declared pest species is established and self-sustaining
- vegetation of similar species richness and species diversity to pre-selected analogue sites is established and self-sustaining.

4.5 Risk Assessment of Environmental Values

Table 3 Risk assessment of environmental values

Environmental Value	Risk	Cause	Potential Impacts	Unmitigated Risk			Controls	Residual Risk		
				Likelihood	Consequence	Risk Rating		Likelihood	Consequence	Risk Rating
Geomorphic	Environmental harm causes impacts to landforms, productivity and soils	Ineffective land management during construction activities	· Erosion · Degradation of downstream water quality from sediment releases · Land degradation · Land contamination · Land compaction	Occasionally	Minor	Low - moderate	· Staff Induction Program · Site planning constraints methodology · Erosion and Sediment Control Implementation · Progressive rehabilitation · Santos Contracting Strategy and pre-qualification of contractors	Unlikely	Minor	Low
Wildlife corridors - Flora	Flora values are impacted causing environmental harm	Ineffective planning, awareness and flora management during construction activities	· Clearing/removal of high value plants (prescribed environmental matters, endangered plants, vulnerable plants) · Clearing/removal of vegetation communities, specifically ERE, OCRE and/or regulated vegetation · Translocation or exacerbation of invasive plants	Unlikely	Minor	Low - moderate	· Staff Induction Program · Site planning constraints methodology · Weed management · Santos Contracting Strategy and pre-qualification of contractors · Progressive rehabilitation	Unlikely	Minor	Low

Environmental Value	Risk	Cause	Potential Impacts	Unmitigated Risk			Controls	Residual Risk		
				Likelihood	Consequence	Risk Rating		Likelihood	Consequence	Risk Rating
Wildlife corridors - Fauna	Fauna values are impacted causing environmental harm	Ineffective planning, awareness and fauna management during construction activities	· Impacts on threatened species and associated habitat as a result of vegetation clearing · Reduced movement opportunities through the creation of barriers within local and regional fauna corridors · Changes in fauna behaviour and/or breeding patterns from noise, dust and/or vibration · Entrapment of wildlife in pipeline trench · Accidental injury or death during construction activities (e.g. entrapment in the open pipeline trench, vehicle strikes etc)	Unlikely	Minor	Low	· Staff Induction Program · Site planning constraints methodology · Controlled vehicle speed where potential fauna movements may occur · Santos Contracting Strategy and pre-qualification of contractors · Short duration of activity · Progressive rehabilitation	Unlikely	Minor	Low

Environmental Value	Risk	Cause	Potential Impacts	Unmitigated Risk			Controls	Residual Risk		
				Likelihood	Consequence	Risk Rating		Likelihood	Consequence	Risk Rating
Water quality	Quality and quantity is impacted beyond existing impacts in the region	Construction of flowlines	· Construction of linear infrastructure through watercourses and wetlands disrupting bed and banks, habitats, fauna and impacting upon water quality · Linear infrastructure altering or disrupting flows · Increased impervious areas and associated increased runoff from site potentially causing sedimentation of watercourses and degradation of aquatic habitats and water quality · Hydrocarbon or chemical spills and/or runoff potentially causing degradation of aquatic habitats and water quality · Sedimentation of waters as a result of land disturbance	Unlikely	Minor	Low	· Work programs in floodplains/riparian/water crossing areas will be scheduled to take into account seasonal conditions and rainfall/flood likelihood · The pipeline construction will be conducted in the following preferential order: (a) firstly, in times where there is no water present; (b) secondly, in times of no flow; and (c) thirdly in times of flow, but in a way that does not impede low flow · Staff Induction Program · Progressive rehabilitation · Santos Contracting Strategy and pre-qualification of contractors	Unlikely	Minor	Low

Environmental Value	Risk	Cause	Potential Impacts	Unmitigated Risk			Controls	Residual Risk		
				Likelihood	Consequence	Risk Rating		Likelihood	Consequence	Risk Rating
Rehabilitation	Rehabilitation is not successful on completion of development activities or as required by Environmental Authority.	Ineffective rehabilitation planning and execution.	· Erosion · Degradation of downstream water quality from sediment releases · Loss of topsoil · Land suitability changes · Land degradation · Reduction in agricultural productivity	Unlikely	Moderate	Moderate	· Implementation of erosion and sediment controls · Site planning constraints methodology · Staff Induction Program · Progressing rehabilitation · Santos Contracting Strategy and pre-qualification of contractors	Unlikely	Minor	Low
Waste management	General and Regulated waste causing harm to environment	Ineffective waste management practices	· Waste incorrectly managed causing unintended environmental harm	Unlikely	Moderate	Moderate	· Implementation of Waste and resource management hierarchy as prescribed in the *Waste Reduction and Recycling Act 2011*. · Register of all chemicals stored on site. · Wastes are not burned or allowed to be burned on site · Santos Contracting Strategy and pre-qualification of contractors.	Unlikely	Minor	Low

Table 4 Risk assessment matrix

Likelihood of the Consequence	Maximum Reasonable Consequence				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost certain	Moderate	Moderate-High	High	High	High
Likely	Low-Moderate	Moderate	Moderate-High	High	High
Occasionally	Low	Low-Moderate	Moderate-High	High	High
Unlikely	Low	Low	Moderate	Moderate-High	Moderate-High
Rare	Low	Low	Low-Moderate	Moderate	Moderate-High

Definitions

Likelihood of Consequence

- Rare: this will probably never happen / recur
- Unlikely: Do not expect it to happen / recur but it is possible it may do so
- Occasional: might happen or recur occasionally
- Likely: will probably happen/recur, but is not a persisting issue/ circumstance
- Almost certain: will undoubtedly happen/recur, possibly frequently

Maximum reasonable consequence

- Insignificant: A risk event that, if it occurs, will have little or no impact on the environmental value
- Minor: A risk event that, if it occurs, will have a minor impact on the environmental value
- Moderate: A risk event that, if it occurs, will have a minor impact on the environmental value
- Major: A risk event that, if it occurs, will have a major impact on the environmental value
- Catastrophic: A risk event that, if it occurs, will have a catastrophic impact on the environmental value

5 Required Outcome Assessment

Schedule 2, Part 5 of the RPI Reg provides criteria for assessment by agencies. In accordance with Section 14(3) of the RPI Reg, if the application demonstrates compliance with either of the prescribed solutions stated in Part 5, Schedule 2, the proposed activities will meet the required outcome for the regional interest. Critically, the application demonstrates that the prescribed solution provided in s15(1)(a) will be met as the proposed activity, a 5.5 km buried flowline will not impact on an environmental attribute of the Channel Country SEA. The application also demonstrates the prescribed solution provided in s15(1)(b) will also be met (Table 5).

Table 5 Schedule 2, Part 5 RPI Reg

Schedule 2, Part 5 RPI Reg		Relevance To Application
14 Required outcome *The activity will not result in a widespread or irreversible impact on an environmental attribute of a strategic environmental area.*	ü	The petroleum activities would not result in a widespread or irreversible impact on each of the environmental attributes as provided in section 3 and 4.
15 Prescribed solution *(1) The application demonstrates either—* *(a) the activity will not, and is not likely to, have a direct or indirect impact on an environmental attribute of the strategic environmental area; or*	ü	Refer to section 3 and 4.
(b) all of the following— *(i) if the activity is being carried out in a designated precinct in the strategic environmental area—the activity is not an unacceptable use for the precinct;*	ü	The proposed activities do not include any of the unacceptable uses prescribed by Section 15(2) of the RPI Act.
(ii) the construction and operation footprint of the activity on the environmental attribute is minimised to the greatest extent possible;	ü	Constraints planning will be implemented to minimise disturbance to an absolute must.
(iii) the activity does not compromise the preservation of the environmental attribute within the strategic environmental area;	ü	Refer to section 3 and 4.
(iv) if the activity is to be carried out in a strategic environmental area identified in a regional plan— the activity will contribute to the regional outcomes, and be consistent with the regional policies, stated in the regional plan.	ü	The South West Regional Plan does not identify the Channel Country SEA.

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