

ATTACHMENT 4 – ASSESSMENT REPORT



# **Regional Interests Development Application Assessment Report**

**Aztec 1 Gas Flowline** 

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### **Abbreviations and Units**

Acronym	Description		
ATP	Authority to Prospect		
DES	Department of Environment and Science, Queensland		
DNRME	Department of Natural Resources, Mines and Energy		
DSDMIP	Department of State Development, Mining, Infrastructure and Planning		
EA	Environmental Authority		
ha	Hectares		
km	Kilometre		
m	Metres		
N/A	Not Applicable		
P&G Act 2004	Petroleum and Gas (Production and Safety) Act 2004		
PL	Petroleum Lease		
QLD	Queensland		
RE	Regional Ecosystem		
RIDA	Regional Interests Development Approval		
RPI Act	Regional Planning Interests Act 2014		
RPI Reg	Regional Planning Interests Regulation 2014		
SEA	Strategic Environmental Areas		
SWQ	South-West Queensland		

### 1.0 Introduction

Santos Limited (Santos) has prepared this assessment report to support an assessment application for a Regional Interests Development Approval (RIDA) as required under section 29 of the *Regional Planning Interests Act 2014*) (RPI Act) to be submitted to the Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP).

The application is of an administrative nature. It seeks only to authorise operation of the Aztec 1 gas flowline (Petroleum Pipeline Licence 2046 (PPL2046)) on Lot 1 on Plan SP133822 within the Channel Country SEA. The Aztec pipeline commences in Authority to Prospect (ATP) 1189, running south into Okotoko 1 well in Petroleum Lease (PL) 82, via PL 83. The Aztec 1 gas flowline is essential to initially production test, then should the PL application be granted over the Aztec 1 well, commercialise the hydrocarbon resource from the Aztec 1 well.

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 Regional Planning Interests Act 2014 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; and
- An assessment of how the proposed activities meet the required outcome for Strategic Environmental Areas (SEA) as detailed in the *Regional Planning Interests Regulation 2014* (RPI Reg).

### 1.1 Landholder Copy of the Application

Separate regulatory systems are in place that require Santos to notify the landholder of petroleum activities occurring within their properties. Given the pre-existing nature of the activities (refer to Section 2.0) notification to the landholder has already ensued. Notwithstanding, a copy of the application will be given to the landowner within 5 business days after the application is made in accordance with Section 30 of the RPI Act and Schedule 5 of the RPI Reg.

### **1.2 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 activities are located solely on Lot 1 on Plan SP 133822 forming part of Durham Downs Pastoral Station, a 8,910 km<sup>2</sup> cattle station operated by S. Kidman & Co.

Discretionary notification under s34(4) would not be necessary given the pre-existing nature of the activities (refer section 2.0), 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 above.

### **1.3 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 Natural Resources, Mines and Energy (DNRME).

### 2.0 **Proposed Activity**

The application seeks authorisation to operate the Aztec 1 gas flowline under PPL 2046, within the Channel Country SEA. Infrastructure and disturbances associated with PPL 2046 is listed in Table 1 and shown in Figure 1. The infrastructure listed in Table 1 is existing infrastructure, constructed under the authority of ATP1189 (EA EPPG03518215), PL 82 (EA EPPG03518115) and PL 83 (EA EPPG03517715).

#### Table 1: Existing Surface Disturbance

	Pre-Existing Disturbance			
Pre-Existing Infrastructure	Length (km)	Operational Width (km)	Area (ha)	
Buried Pipeline (Aztec 1 gas flowline) including pigging station	11.3	0.003	3.41 ha	
		Total	3.41 ha	

The Aztec pipeline commences in ATP 1189, running south into Okotoko 1 well in Petroleum Lease (PL) 82, via PL 83. The PPL and associated EA are required due to PL 82 and PL 83 being administered under the *Petroleum Act 1923*, which does not provide for flowlines being able to operate across PL boundaries. An application for a PPL (PPL 2046) was lodged with DNRME on 21 August 2019 to authorise the operation of the Aztec 1 gas flowline. An application for an EA for the Aztec 1 gas flowline (PPL 2046) was lodged with DES on 9 September 2019, and approved on the 12 September 2019, EA number EA0001944.

Santos intends to utilise the Aztec 1 gas flowline to initially production test the hydrocarbon resources from the Aztec 1 well. Should the test be successful, a PL application covering the Aztec 1 well will be submitted. At the time of PL approval, the purpose of the Aztec 1 gas flowline will be to transport hydrocarbons from the Aztec field to existing Santos facilities to be processed and sold.

The operation of the Aztec 1 gas flowline (PPL 2046) will not result in new surface disturbance to land outside of the existing disturbance footprint. Activities will be limited to production testing and 'production' related operational maintenance and restoration at the end-of-life. Description of the activities are provided in Section 2.1.

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

### 2.1 Buried Pipeline

The existing 168.3mm diameter buried steel pipeline (DN150) is proposed to be utilised to transport extracted petroleum for production testing and in future, production. The pipeline starts at the Aztec 1 well and connects to the existing authorised Wippo to Okotoko Gas Spineline (PPL 39). It is primarily buried underground. It protrudes from the surface for approximately 15m where each mid-line riser has been installed, for which there are four total. The mid-line riser is raised approximately 0.8 m above ground level on supports. The location of each mid-line riser is shown in Figure 1. The pipeline right-of-way surface has been rehabilitated to reinstate drainage. The operational width of the pipeline corridor is 3 m. No new surface disturbance to land is required. The pipeline will be restored at end-of-life in accordance with the relevant EA conditions.

<sup>&</sup>lt;sup>1</sup> S. Kidman & Co Ltd (2018) *Durham Downs*, <u>https://www.kidman.com.au/properties/5/durham-downs</u>, Accessed 28/08/2019.



Figure 1: Location of Aztec 1 Gas Flowline



### 3.0 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; and
- Beneficial flooding.

As discussed in Section 2.0, the operation of the Aztec 1 gas flowline (PPL 2046) will not result in new surface disturbance to land outside of the existing disturbance footprint. The proposed activities are limited to production testing, future production, operational maintenance and restoration of existing infrastructure at end-of-life. Notwithstanding, the relevance of the above environmental attributes to the activity is described below.

### 3.1 Riparian Process

Regional Ecosystem (RE) mapping and aerial photography indicate that vegetation present within PPL 2046 is typical of the elsewhere in the bioregion (Channel Country) and subregions (Cooper – Diamantina Plains) – dominated by open shrublands, tussock grasslands, variable sparse to open-herbland and low open woodland typically fringing drainage lines. REs present in PPL 2046 are widespread and commonly present across the Cooper Creek catchment area. Vegetation within PPL 2046 has been subject to long-term cattle grazing from the operation the Durham Downs pastoral station.

REs mapped to be present where the activity is proposed is shown in Figure 4, and detailed in Table 2. All REs are listed as No Concern at Present (NCAP). These REs are known to include riparian vegetation, particularly within the Cooper Creek and its braided channels, which surround the proposed activity. The Aztec 1 gas flowline crosses braided channels of the Cooper Creek at a number of locations.

There are no mapped Environmentally Sensitive Areas (ESAs) present within or surrounding the proposed activity. The Meringhina Waterhole is located approximately 1.7 kilometres west of PPL 2046.

#### **Table 2: Regional Ecosystems Descriptions**

RE Code	RE Short Description	VM Act Class	BD Status	Structural Category
5.3.8a	<i>Eucalyptus coolabah l</i> ow open woodland +/- <i>Duma</i> <i>florulenta</i> on braided channels, drainage lines, flood plain lakes and claypans	LC	NCAP	Very Sparse
5.3.13a	<i>Duma florulenta</i> open shrubland in depressions on flood plains, interdune flats, clay pans and clay plains.	LC	NCAP	Very Sparse
5.3.18a	Braided channel complex of major alluvial plains, includes <i>Chenopodium auricomum</i> open shrubland and variable sparse to open-herbland	LC	NCAP	Sparse
5.3.18b	Braided channel complex of major alluvial plains, includes <i>Chenopodium auricomum</i> open shrubland and variable sparse to open-herbland	LC	NCAP	Sparse

### 3.1.1 Regional Ecosystem Descriptions

## 5.3.8a - *Eucalyptus coolabah* low open woodland +/- *Duma florulenta* on braided channels, drainage lines, flood plain lakes and claypans

*Eucalyptus coolabah low* open woodland with a distinct and semi-continuous, low shrub layer dominated by *Duma florulenta*. Scattered shrubs including *Acacia stenophylla, Eremophila bignoniiflora* and *Chenopodium auricomum* occur frequently. The ground cover is dominated by the perennial grasses *Eragrostis setifolia* and *Sporobolus mitchellii* and/or seasonally abundant ephemeral herbs. The latter includes the grasses *Dactyloctenium radulans, Dichanthium spp.* and *Iseilema vaginiflorum* which occur infrequently and the forbs *Alternanthera nodiflora, Calotis hispidula, Centipeda thespidioides, Stemodia glabella, Cullen cinereum, Senecio depressicola* and *Streptoglossa adscendens*, which are frequently present. A number of other ephemeral forbs, including species from the *Apiaceae, Convolvulaceae, Fabaceae, Goodeniaceae,* and *Malvaceae* occur infrequently but may be seasonally prominent. Widespread on and between braided channels where water backs up on frequently flooded alluvial plains. Associated soils are very deep, grey and brown cracking clays with a self mulching surface. Surface silt and sand bands are common in soil profile. Riverine wetland or fringing riverine wetland. (BVG1M: 16a)

## 5.3.13a - *Duma florulenta* open shrubland in depressions on flood plains, interdune flats, clay pans and clay plains.

Duma florulenta open shrubland commonly with Chenopodium auricomum, Maireana aphylla and occasional low trees and tall shrubs including Acacia stenophylla, Acacia victoriae, Eremophila bignoniiflora, Eucalyptus coolabah. The ground layer composition and density varies in response to incidence of flooding and may be dominated by perennial grasses, sedges and/or ephemeral forbs including Eragrostis setifolia, Sporobolus mitchellii, Eleocharis pallens, Cyperus spp., Eleocharis plana, Echinochloa turneriana, Eriochloa pseudoacrotricha and Panicum laevinode, Cullen cinereum, Marsilea drummondii, Ipomoea diamantinensis, Alternanthera nodiflora, Senecio depressicola and Ethuliopsis cunninghamii. Forbs commonly dominate after inundation in cooler months and legumes/grasses including Aeschynomene indica and/or Sesbania cannabina +/-Echinochloa turneriana commonly dominate after inundation in hotter months. Occurs in intermittently inundated depressions or fringing braided channels on alluvial plains. Associated soils are very deep, neutral to moderately alkaline, crusted, grey cracking clays. Soils may be self mulching and may have sand bands in the profile. Moderate gilgai micro relief. Palustrine wetland (e.g. vegetated swamp). (BVG1M: 34g)

## 5.3.18a - Braided channel complex of major alluvial plains, includes *Chenopodium auricomum* open shrubland and variable sparse to open-herbland.

*Chenopodium auricomum* open shrubland, frequently with pure stands of *Chenopodium auricomum*, however, scattered *Eucalyptus coolabah* low trees and *Eremophila bignoniiflora* tall shrubs may be present. The ground layer is usually sparse, and seasonally dominated by grasses, sedges and forbs. The sedge *Eleocharis pallens* or perennial grass *Eragrostis setifolia* frequently dominate the ground layer. *Sporobolus mitchellii* is frequently dominant in the channels. Occurs on braided channels on alluvial plains of major rivers. Associated soils are very deep, crusted, red, brown and grey cracking clays that are subject to scalding. Surfaces may be weakly self mulching. Palustrine wetland (e.g. vegetated swamp). (BVG1M: 34g)

## 5.3.18b - Braided channel complex of major alluvial plains, includes *Chenopodium auricomum* open shrubland and variable sparse to open-herbland.

Variable sparse to open-herbland with either grasses or forbs dominating the ground layer depending on incidence of flooding and seasonal conditions. At times extensive areas may be denuded of any species. *Sporobolus mitchellii* occurs frequently and may be prominent, while *Eragrostis setifolia* is locally common. After favourable seasons, herbs form a distinct but discontinuous ground cover. The dominant ephemerals include *Iseilema vaginiflorum, Arabidella nasturtium, Atriplex velutinella, Brachyscome dentata, Pycnosorus pleiocephalus, Ethuliopsis cunninghamii, Euphorbia drummondii, Goodenia fascicularis and Senecio depressicola. Scattered low shrubs may occur with emergent trees fringing the association. Scattered low shrubs may occur. After summer local flooding, <i>Dactyloctenium radulans, Panicum laevinode, Iseilema* spp. and *Chloris pectinata* usually predominate. *Atriplex spp., Sclerolaena* spp., and *Asteraceae* are conspicuous after winter local flooding. *Echinochloa turneriana* usually predominates after early summer (general) flooding with *Pycnosorus pleiocephalus* and *Trigonella suavissima* conspicuous after early winter flooding. Occurs on braided channel systems on alluvial plains of major rivers. Associated soils are very deep, crusted, red, brown and grey cracking clays that are subject to scalding. Surfaces may be weakly self mulching. Floodplain (other than floodplain wetlands). (BVG1M: 31a) (DSITI, 2016).

### 3.1.2 Potential Impacts

The activity will be located within the existing infrastructure footprint. No new surface disturbance to land, such as clearing vegetation in or near streams, lakes, floodplains or wetlands, is required as part of the proposed activity. Access to and from the proposed activity will occur along the existing access tracks only.

Following cessation of petroleum production, existing infrastructure would be rehabilitated to promote the natural re-establishment of vegetation consistent with the surrounding undisturbed land in accordance with the relevant EA conditions. As such, there will be no new disturbance or change to riparian corridors along streams and lakes and within floodplains and wetlands as a part of this activity. Accordingly, the proposed activities would not cause a widespread or irreversible impact on riparian processes within the Channel Country SEA.



Figure 2: Regional Ecosystems



Figure 3: State and Regional Biodiversity Corridors

### 3.2 Wildlife Corridors

Figure 3 shows state and regional riparian and terrestrial corridors present within PL 1060 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<sup>2</sup>. 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<sup>2</sup>.

The proposed activities will be located within a pre-disturbed area of existing riparian corridor. There are no mapped terrestrial corridors present within or surrounding the proposed activity or PPL 2046. The area where the existing infrastructure is present has been subject to long-term cattle grazing from the operation the Durham Downs pastoral station. Notwithstanding, the REs surrounding the existing infrastructure (as described in Section 3.1) may provide suitable general habitat for a range of wetland water birds and other flora and fauna.

There are no mapped Environmentally Sensitive Areas (ESA) near the Aztec 1 gas flowline; the closest ESA, Category C ESA Essential Habitat, is located approximately 5 km to the south east of the termination point of the flowline.

### 3.2.1 Potential Impacts

No new disturbance(s) to aquatic and terrestrial fauna or wildlife corridors is to be undertaken as part of these activities. Measures will be adopted to prevent fauna entrapment within operational areas, and hygiene protocols will be implemented as appropriate to minimise the introduction, spread and persistence of weed species. Access to and from the proposed activity will occur along the existing access tracks only. Following cessation of petroleum production, existing infrastructure would be rehabilitated to promote the natural re-establishment of vegetation consistent with the surrounding undisturbed land, in accordance with relevant EA conditions. As such, there is no disturbance or change to wildlife corridors as a part of this activity and therefore the proposed activities would not cause a widespread or irreversible impact on wildlife corridors within the Channel Country SEA.

### 3.3 Water Quality

### Surface Water

The braided channels associated with the Cooper Creek surround the proposed activity. Generally, the Cooper Creek 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.

Historical (1965-2016) water quality data from the QLD Government's Cooper Creek gauging station 003103A, located approximately 94 kilometres south west, is summarised in Table 3.

<sup>&</sup>lt;sup>2</sup> DERM 2009 Biodiversity Planning Assessment, Channel Country Bioregion, Landscape Expert Panel Report, Version 1.1

#### Table 3: Cooper Creek Surface Water Quality (1956-2016)

Parameter	Average Value
Conductivity @ 25°C	345 µS/cm
Turbidity	512 NTU
pН	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

#### Groundwater

The main Great Artesian Basin (GAB) aquifers of the PPL 2046 area are within the Eromanga Basin stratigraphy and include the Winton Formation, Cadna-owie Formation, Hooray Sandstone, Hutton Sandstone and Poolowanna Formation (Precipice Sandstone equivalent). The aquifers of the Eromanga Basin are considered highly productive aquifers over most of the GAB. Shallow groundwater is generally found within the Quaternary and Tertiary alluvium formations associated with the very flat structures of flood plains and is absent where the Winton Formation occasionally outcrops.

The Quaternary and Tertiary alluvium formations are generally unconfined and form the uppermost phreatic water table (where present). Insufficient water level data is available for the Quaternary formations to determine the level of continuity, resulting in moderate vulnerability of the groundwater to possible contaminants. Groundwater from Tertiary sediments and the Winton Formation are characterised by a higher proportion of sodium and magnesium ranging in EC values from 3,000 to  $13,000 \ \mu\text{S/cm}^3$ .

No registered groundwater bores are located nearby to the proposed activity or within PL 2046. There are no GAB ROP discharge or recharge springs located within PL 2046. The closest GAB springs are located more than 200 kilometres from the Aztec 1 gas flowline. Terrestrial Groundwater Dependant Ecosystems (GDE) and GDE aquifers (unconsolidated sedimentary aquifers) may be present within the PL 2046 area.

### 3.3.1 Potential Impacts

The activities do not involve any new surface disturbance to land, such as clearing vegetation in or near streams, lakes, floodplains or wetlands. No activities proposed involve the discharges of water (point or diffuse sources) or the construction or operation of regulated dams and other major infrastructure (i.e. separation ponds, permanent camps).

Any fuels / chemicals used on site would 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

<sup>&</sup>lt;sup>3</sup> Golder Associates 2013 Underground Water Impact Report For Santos Cooper Basin Oil & Gas Fields, SW QLD

as reasonably practicable, minimising risks associated with contamination, or a reduction in water quality, in accordance with EA conditions.

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

Given the scope of proposed activities, combined with the above management measures, petroleum production from pre-existing infrastructure is unlikely to disturb or alter the physical, chemical and biological quality of water in the watercourse channels and on floodplains that support and maintain the natural aquatic and terrestrial ecosystems. Accordingly, the proposed activities would not cause a widespread or irreversible impact on water quality within the Channel Country SEA.

### 3.4 Hydrological Processes

### Regional

Topography is limited to low undulating topography between the drainage channel system. The Channel Country is characterised by vast flat-lying, braided, flood and alluvial plains surrounded by gravel or gibber plains, dunefields and low ranges. The low resistant hills and tablelands are remnants of the flat-lying Cretaceous sediments.

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<sup>2</sup>. 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

#### Local

The braided channels associated with the Cooper Creek surround the proposed activity. The Aztec 1 gas flowline crosses braided channels of the Cooper Creek at a number of locations (refer Figure 4). The area of the proposed activity is subject to intermittent flows associated with Cooper Creek flood events and will experience intermittent surface water flows during storm events, causing localised ponding of surface water, as discussed above.

The Aztec 1 gas flowline is located in an area mapped arid/semi-arid floodplain lignum swamps. The northern section of the flowline is located is classified as palustrine wetlands, with the remaining sections not classified. Palustrine wetlands are essentially low-lying clay pan lakes surrounded by sand dunes and sand plains. The clay pans receive local inflows from their surrounding catchment areas during local rainfall events (BOM, 2018).

### 3.4.1 Potential Impacts

The proposed activities are located within the existing infrastructure footprint. The existing pipeline is buried underground and the surface has been rehabilitated to reinstate existing drainage. The 3 metre operational right-of-way has not been constructed to any flood immunity, and will enable the passage of water keeping with existing hydrology. The mid-line risers are raised approximately 0.8 metres above ground on supports to avoid impacts to the surface hydrology at these locations. The pipeline will be restored at the end-of-life in accordance with the relevant EA conditions.

No new surface disturbance to land, such as clearing vegetation in or near streams, lakes, floodplains or wetlands, is required as part of the proposed activities. Given the nature of the proposed activities,

and the implementation of the above design and management measures, there would be no widespread or irreversible impact on hydrological processes within the Channel Country SEA.

### 3.5 Geomorphic Processes

### Regional

Surface geology is dominated by Quaternary alluvium deposits associated with flood plains, with consolidated Tertiary sediments or Winton Formation on the higher ground. Cooper Creek is a large sedimentary sump accreting over a vast floodplain<sup>4</sup>.

### Local

Land systems mapped at the location of the proposed activity are consistent with Landzone mapping. The proposed activity location is primarily mapped as Channel Country, flooded alluvial plains with anatomising channels. The area is associated with the irregularly flooded Cooper Creek main channel area<sup>5</sup>. The land system present within proposed activity location is summarised in Table 4. Soils are mapped as grey clays and grey cracking clays (Map Code: 490)<sup>6</sup>.

#### Table 4: Land System at Proposed Activity Location

Map Code	Land System Description	Agricultural Land Class
CC87	Flooded-plains of major rivers consisting of numerous braided stream channels that are seasonally flooded and slightly higher areas raised between the channels: chief soils are grey clays (Ug5.24) but other cracking clays such as (Ug5.34) and (Ug5.25) may occur.	C2 - Pasture Land - native pastures

### 3.5.1 Potential Impacts

The proposed activities are located within the existing infrastructure footprint. No new surface disturbance to land, such as excavation, clearing or realigning the beds and banks of watercourse, cultivating soil or excavating on floodplains, are required as part of the proposed activity. No new structures are proposed to be placed in a watercourse, lake or spring or on floodplains as a part of this activity.

The proposed activities are located away from the sources / areas of significant geomorphic processes. The existing pipeline is buried underground and the surface has been rehabilitated to reinstate existing drainage. The 3 metre operational right-of-way has not been constructed to any flood immunity, and will enable the passage of water keeping with existing hydrology. The mid-line risers are raised approximately 0.8 metres above ground on supports to avoid impacts to the surface hydrology at these locations. The pipeline will be restored at the end-of-life in accordance with the relevant EA conditions.

Following cessation of petroleum production, the existing operational right-of-way would be rehabilitated to promote the natural re-establishment of vegetation consistent with the surrounding undisturbed land. As such, the proposed activity would not alter the delivery of sediment to the river system from adjacent lands and the natural erosion of the bed, banks and floodplains. Accordingly, it is not envisaged that the

<sup>&</sup>lt;sup>4</sup> Maroulis, J (undated) *Channel Country landforms and the processes that shape them*. University of Southern QLD Faculty of Education/Australian Centre for Sustainable Catchments.

<sup>&</sup>lt;sup>5</sup> DES (2018). Land systems – western arid region land use study – part 1 – AWA2 (spatial dataset), Accessed 28/08/2019. . Available online at: <u>gldspatial.information.gld.gov.au</u>

<sup>&</sup>lt;sup>6</sup> ASRIS (2018). Atlas of Australian Soils (spatial dataset), Australian Soil Resource Information System (CSIRO), Accessed 28/08/2019. Available online at: <u>http://www.asris.csiro.au/downloads/Atlas/soilAtlas2M.zip</u>

proposed activity would cause a widespread or irreversible impact on geomorphic processes within the Channel Country SEA.

### 3.6 Beneficial Flooding

The braided channels associated with the Cooper Creek surround the proposed activity. The Aztec 1 gas flowline crosses braided channels of the Cooper Creek at a number of locations (refer Figure 4). The area of the proposed activity is subject to intermittent flows associated with Cooper Creek flood events and will experience intermittent surface water flows during storm events, causing localised ponding of surface water, as discussed above.

Generally, the surrounding 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.

### 3.6.1 Potential Impacts

The proposed activities are located within the existing infrastructure footprint. No new surface disturbance activities, including placing new infrastructure within SEA, are proposed as part of this activity.

Following cessation of pipeline operation, existing infrastructure would be rehabilitated to promote the natural re-establishment of vegetation consistent to the surrounding undisturbed land. Given no new disturbance or activities other 'operation' from existing authorised infrastructure is proposed (as described in Section 2.0), altered natural flow paths and natural extent of flooding across floodplains will not occur. Accordingly, the proposed activities would not cause a widespread or irreversible impact on beneficial flooding within the Channel Country SEA.



Figure 4: Watercourses, Wetlands and Strategic Environmental Areas

### 4.0 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, 'operation' from pre-existing disturbances and infrastructure 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
<b>14 Required outcome</b> The activity will not result in a widespread or irreversible impact on an environmental attribute of a strategic environmental area.	*	The petroleum activities would not result in a widespread or irreversible impact on each of the environmental attributes as provided in Section 3.0.
<b>15 Prescribed solution</b> (1) The application demonstrates either— (a) the activity will not, and is not likely to, have a direct or indirect impact on an environmental	•	Refer to Section 3.0.
<ul> <li>altribute of the strategic</li> <li>environmental area; or</li> <li>(b) all of the following— <ul> <li>(i) if the activity is being carried</li> <li>out in a designated precinct in the</li> <li>strategic environmental area—the</li> <li>activity is not an unacceptable use</li> <li>for the precinct:</li> </ul></li></ul>	*	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;	•	Existing operational footprint will be utilised entirely. No new disturbance footprint is proposed within this application.
(iii) the activity does not compromise the preservation of the environmental attribute within the strategic environmental area;	~	Refer to Section 3.0.
(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.	•	The South West Regional Plan does not identify the Channel Country SEA.



**ATTACHMENT 5 – GIS FILES**