

APPENDIX

P

INLAND  
RAIL 

# Surface Water Quality Technical Report

PART 2 OF 2

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

# APPENDIX

# P

## Surface Water Quality Technical Report

### **Appendix C**    General Field Assessment Water Quality Conditions




INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT






# Appendix C




## General field assessment water quality conditions




**Table C.1** Monitoring site description with indicative photos

Site	Description	Photo
1R B2G Macintyre River	The site was located on the Macintyre River, upstream from the Project alignment. Pooled water was present, with no fish passage, however during high flow, fish passage would be moderate. The riparian vegetation present included shrubs and trees. Surrounding land uses included non-irrigated cropping and semi-urban.	
2R B2G Macintyre Brook	The site was located on the Macintyre River, downstream from the Project alignment. Both banks had presence of riparian vegetation including trees and shrubs. No barriers to fish movement were observed. There was water extraction infrastructure observed at the site. The surrounding land uses included industrial and moderate grazing.	
3 B2G Macintyre Brook	The site was located on Macintyre Brook downstream from the Project alignment. Both banks retained riparian vegetation including trees and shrubs. No barriers to fish movement were observed. The surrounding land uses were principally light grazing road structure.	




Site	Description	Photo
6 B2G Macintyre Brook	The site was located on the Macintyre Brook, downstream from the Project alignment. The water was considered a deep pool with riparian vegetation present on either side of the banks. During high flow, moderate fish passage would be achieved with natural vegetation barriers within the water. Surrounding land uses included irrigated cropping.	
7 B2G Macintyre Brook	The site was located on the Macintyre River, downstream of the Project alignment. The riparian vegetation included shrubs and trees. Notable fish barriers included artificial bridge structure and a pipe culvert, causing barriers to fish movement. Surrounding land uses included cropping.	
B2G 11 Canning Creek	The site was located on Canning Creek, downstream of the Project alignment. Riparian vegetation was present, predominantly as grasses and shrubs. Pooled water was identified, providing limited fish passage, however in high flow, moderate fish passage would be facilitated. Surrounding land uses included moderate grazing.	



Site	Description	Photo
B2G 14 Un-named	The site was located on an un-named tributary within the Canning Creek water quality zone. Water was pooled providing no fish passage, however during high flow fish passage would be moderately restricted. Minimal riparian vegetation was present.	
B2G 16 Un-named	The site was located on an un-named tributary within the Canning Creek Water Quality zone on the Project alignment corridor. The water present was in a deep pool providing no fish passage, however during high flow passage would improve to be moderately restricted. Riparian vegetation was limited to shrubs with minimal trees present.	
B2G 24 Grasstree Creek	The site was located on Grasstree Creek, upstream of the Project alignment. The water was pooled with no fish passage, however during high flow fish passage would improve to be moderately restricted. There was limited riparian vegetation present. Surrounding land uses included light grazing.	

Site	Description	Photo
B2G 27 Condamine River	The site was located on the Condamine River, upstream of the Project alignment. During the investigation there was a small isolated pool present. The assessment site was considered to have no fish passage, and during high flow would restrict fish passage. The riparian vegetation present is predominately consisted of grasses and shrubs with minimal tree coverage. Surrounding land uses included agricultural use.	
B2G 30 Condamine River	The site was located on the Condamine River, downstream of the Project alignment. The water was in the form of a pool and run, providing moderate fish passage. The riparian vegetation contains a mixture of grasses, shrubs and trees. Within the watercourse, an artificial weir was present. The surrounding land use included irrigated cropping.	
B2G 33 Condamine River (North Branch)	The site was located on the Condamine River (North Branch), downstream of the Project alignment. The site was dry at the time of assessment. Riparian vegetation was present as a mixture of grasses, shrubs and trees. The surrounding land uses included cropping.	



Site	Description	Photo
B2G 39 Westbrook Creek	The site was located on Westbrook Creek, downstream of the Project alignment. Pooled water was present, providing no fish passage, however during high flow fish passage would improve to be moderately restricted. The riparian vegetation present is predominantly contained grasses with minimal shrub coverage. The surrounding land uses included grazing.	
B2G 40 Dry Creek	The site was located on Dry Creek, downstream of the Project alignment. There was a shallow pool of water present providing no fish passage, however during high flow there would be moderate fish passage. Limited riparian vegetation was present with pasture surrounding the watercourse.	
B2G 42 Dry Creek	The site was located on Dry Creek, downstream of the Project alignment. There was a pool of water present providing no fish passage, however during high flow fish passage would be moderate. The riparian vegetation predominantly consisted of grasses. The surrounding land uses included pasture and light grazing.	

**Table note:**

Sites that were not suitable for water quality sampling assessment are omitted from this table

# APPENDIX

# P

## Surface Water Quality Technical Report

### **Appendix D** Database Interrogation Data

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

# Appendix D

## Database interrogation data

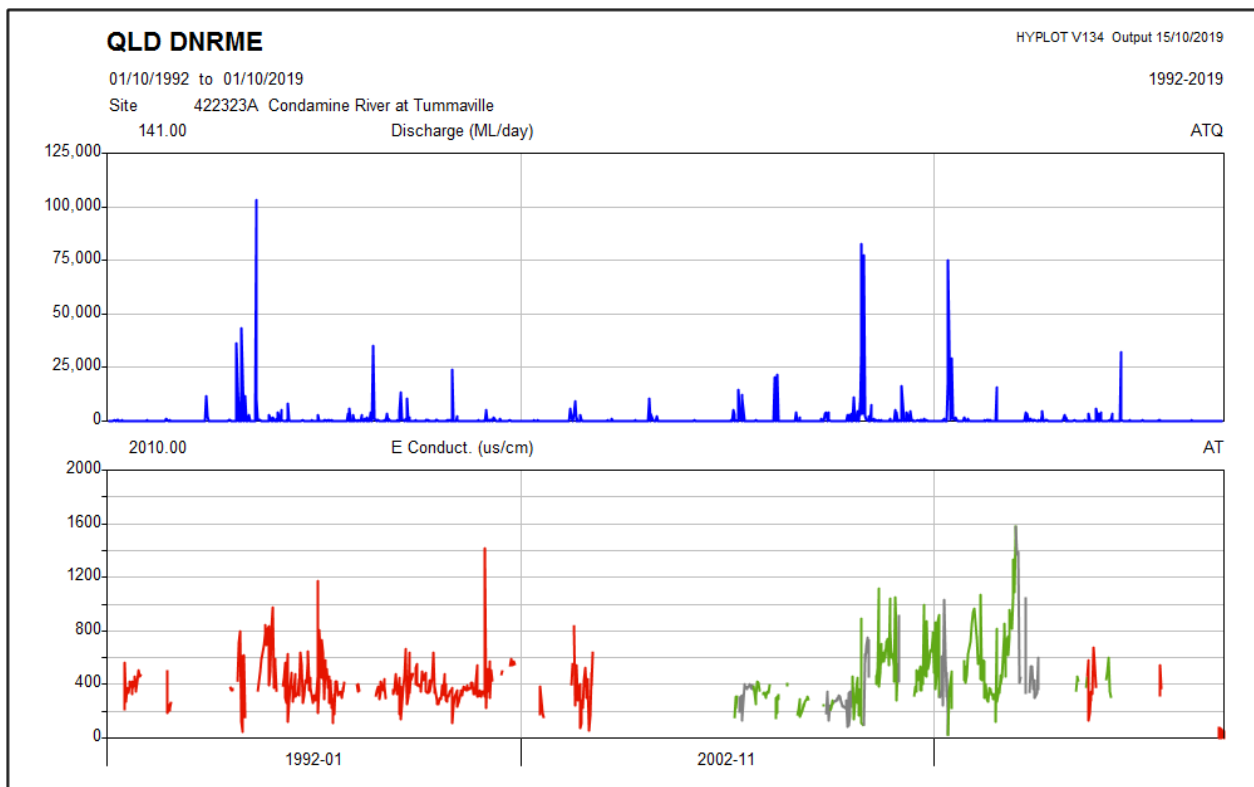


Figure D-1 Historic time series of electrical conductivity and discharge for Condamine River at Tummaville (422323A)

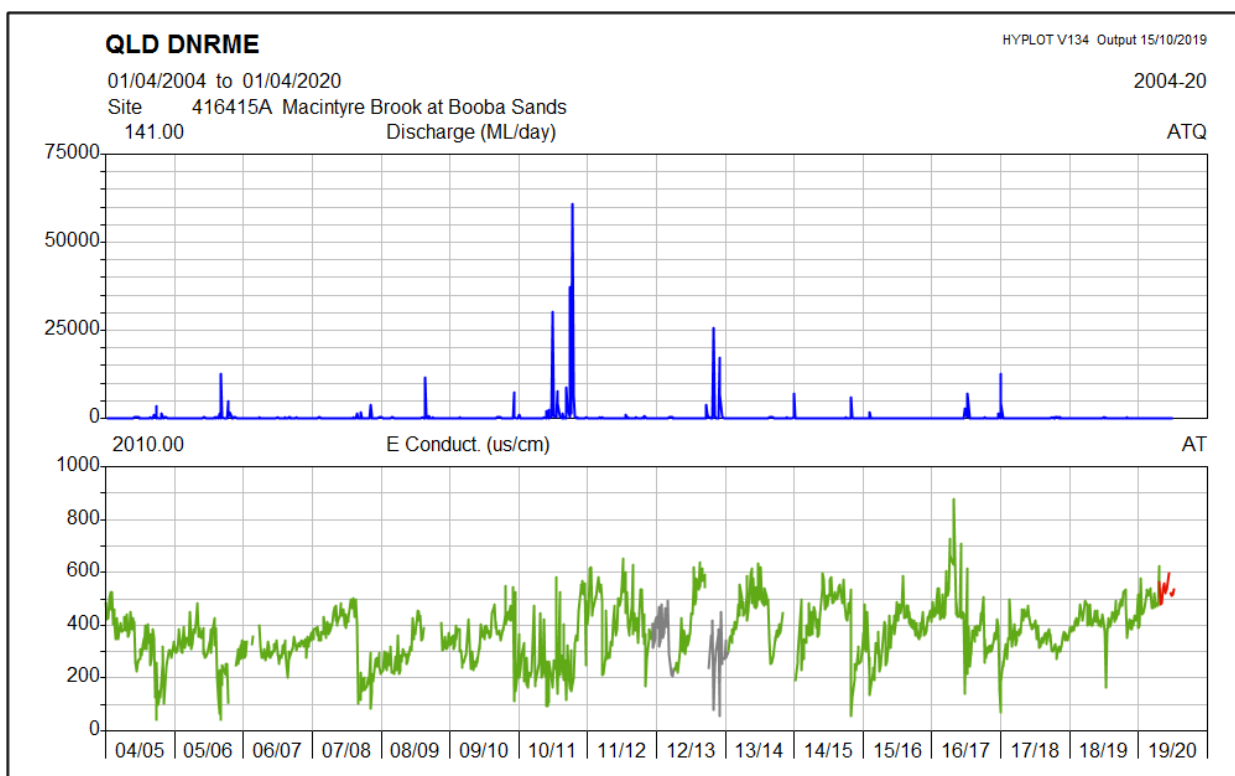


Figure D-2 Historic time series of electrical conductivity and discharge for Macintyre Brook at Booba Sands (416415A)



28°24'19"S 150°28'0"E

28°24'19"S 150°51'58"E



28°45'22"S 150°28'0"E

28°45'22"S 150°51'58"E

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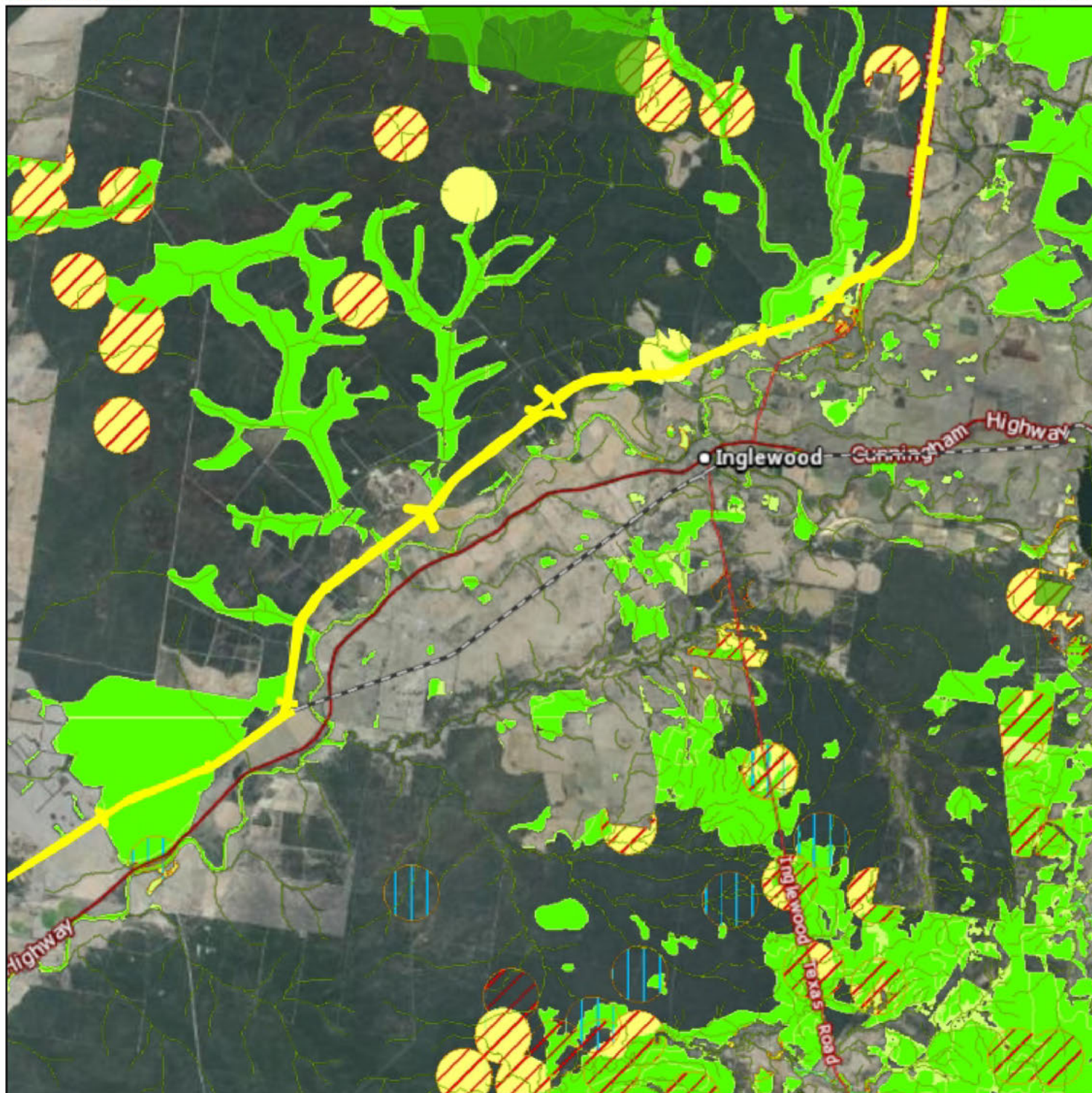
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28°16'12"S 150°49'26"E

28°16'12"S 151°13'24"E



28°37'16"S 150°49'26"E

28°37'16"S 151°13'24"E

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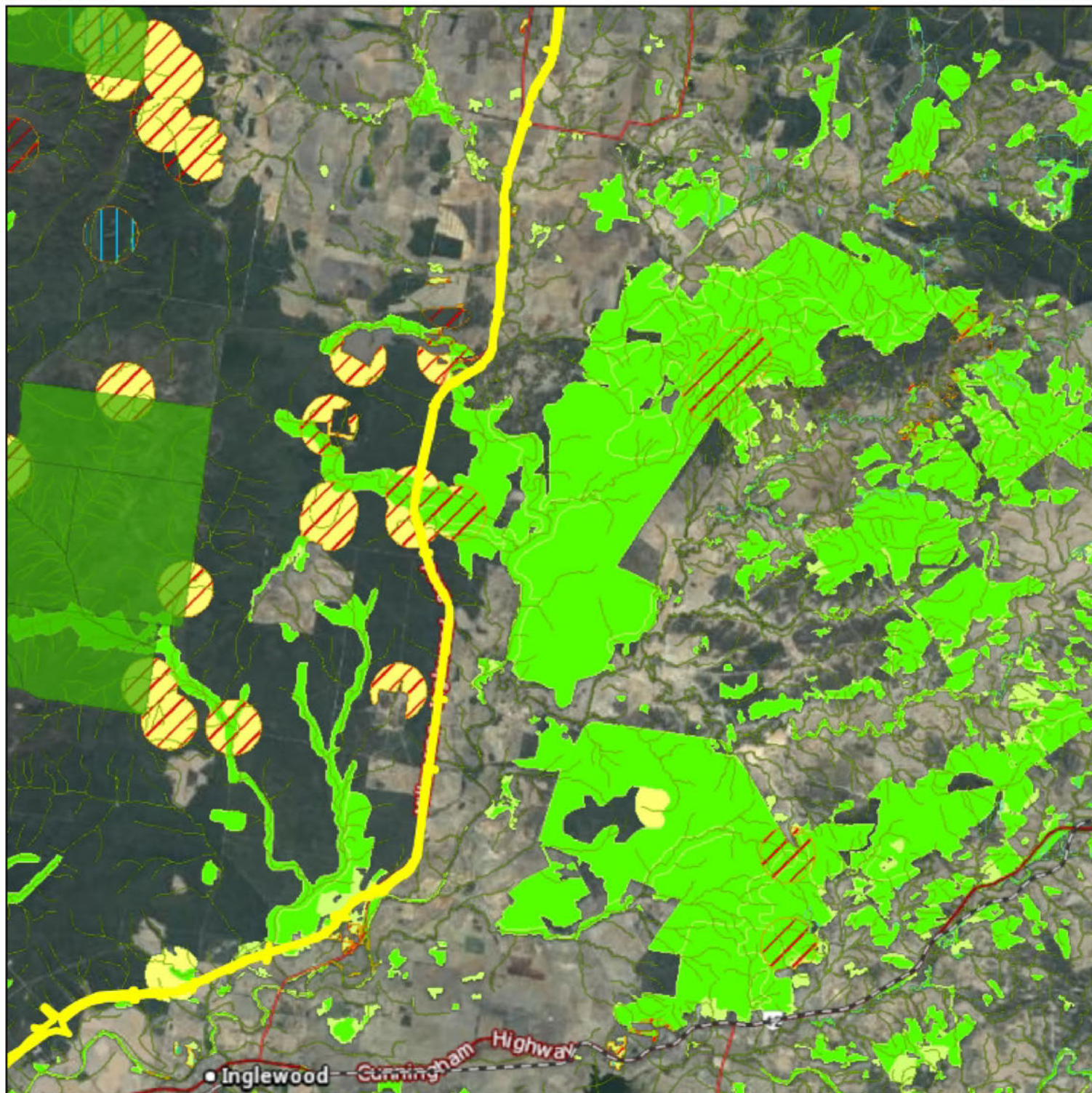
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28°4'11"S 151°0'20"E

28°4'11"S 151°24'17"E



28°25'17"S 151°0'20"E

28°25'17"S 151°24'17"E

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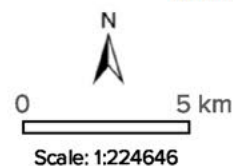


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27°48'0"S 151°6'44"E

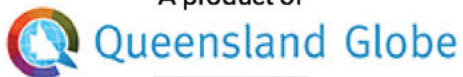
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28°9'9"S 151°6'44"E

28°9'9"S 151°30'42"E

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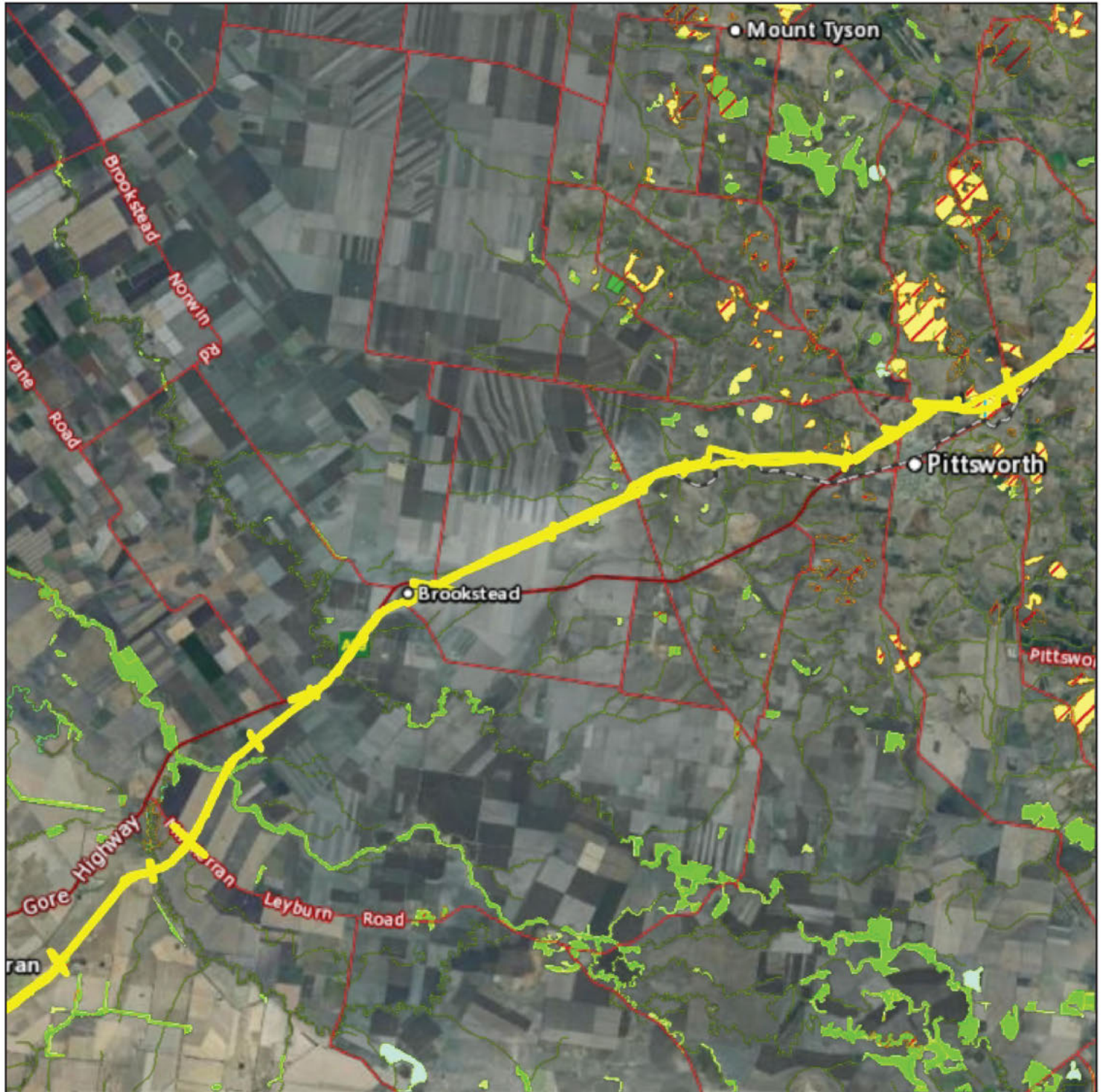
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27°33'58"S 151°18'3"E

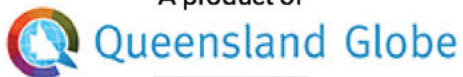
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27°55'11"S 151°18'3"E

27°55'11"S 151°42'0"E

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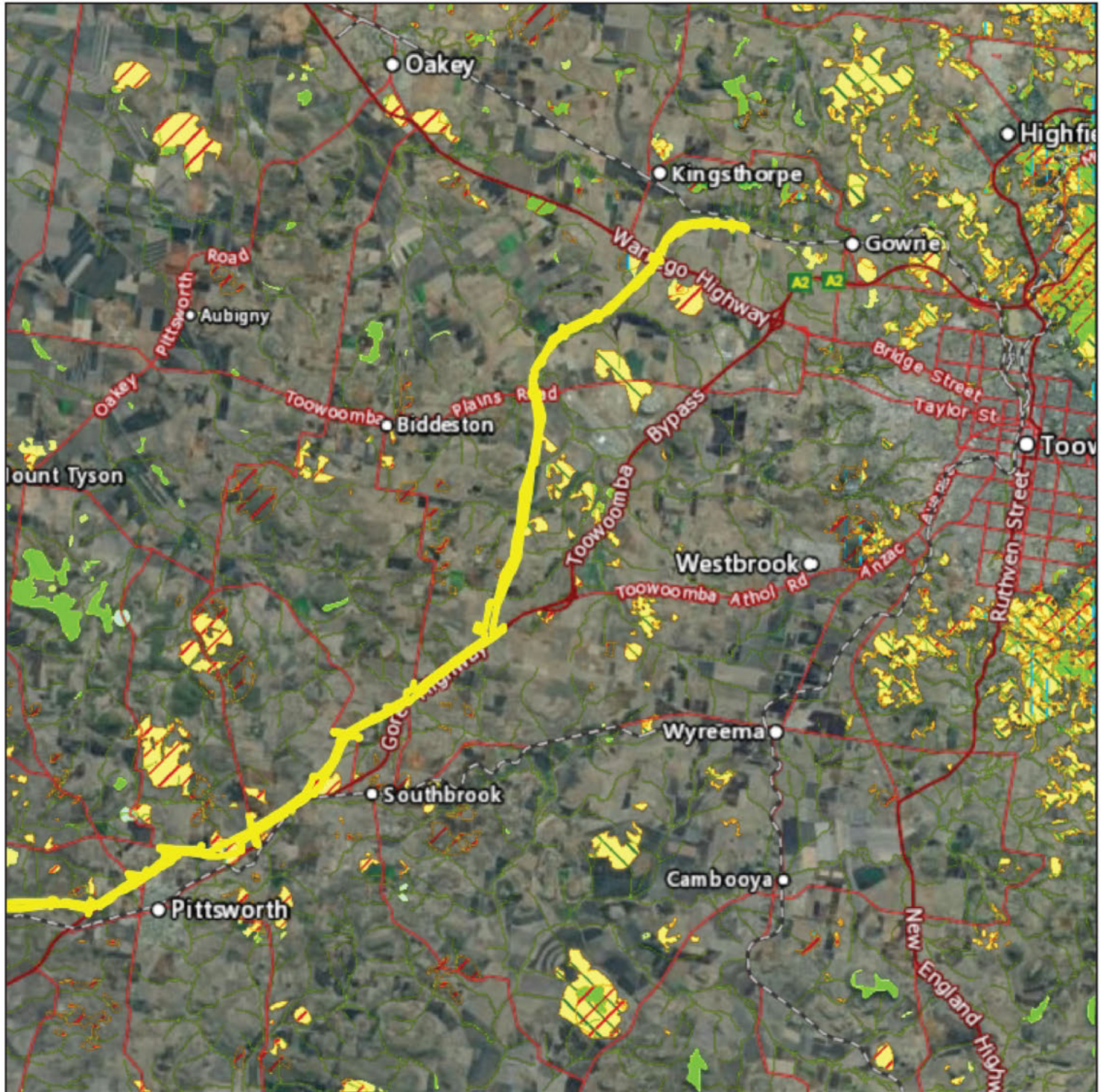
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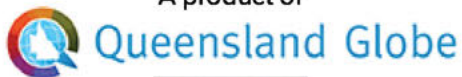
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27°46'30"S 151°34'42"E

27°46'30"S 151°58'40"E

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B2G  
K\_IR\_3100000\_D\_CIV\_PL\_P  
ER\_DISTURBANCE\_FOOTPRIN  
T\_RevF.KMZ - poly



MSES protected area [estates]



MSES protected area [nature  
refuges]



MSES marine park [highly  
protected]



MSES declared sh habitat  
area [A and B areas]



MSES legally secured o set  
area [o set register]



MSES legally secured o set  
area [vegetation o sets]



MSES regulated vegetation  
[de ned watercourse]



MSES declared high ecological  
value waters [watercourse]



MSES declared high ecological  
value waters [wetland]

MSES high ecological  
signi cance wetlands



MSES strategic  
environmental area  
[designated precinct]



MSES regulated vegetation  
[category B - endangered or  
of concern]



MSES regulated vegetation  
[category C- endangered or  
of concern]



MSES regulated vegetation  
[category R- GBR riverine]



MSES regulated vegetation  
[essential habitat]



MSES regulated vegetation  
[100m from wetland]



MSES wildlife habitat  
[endangered or vulnerable]



MSES wildlife habitat  
[special least concern  
animal]



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MSES wildlife habitat [SEQ  
koala habitat - core]



MSES wildlife habitat [SEQ koala habitat - locally re ned]



Railway



Road

 Highway

 Main

 Local

 Private

Cities and Towns



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28°22'53"S 150°22'5"E

28°22'53"S 150°46'3"E



28°43'56"S 150°22'5"E

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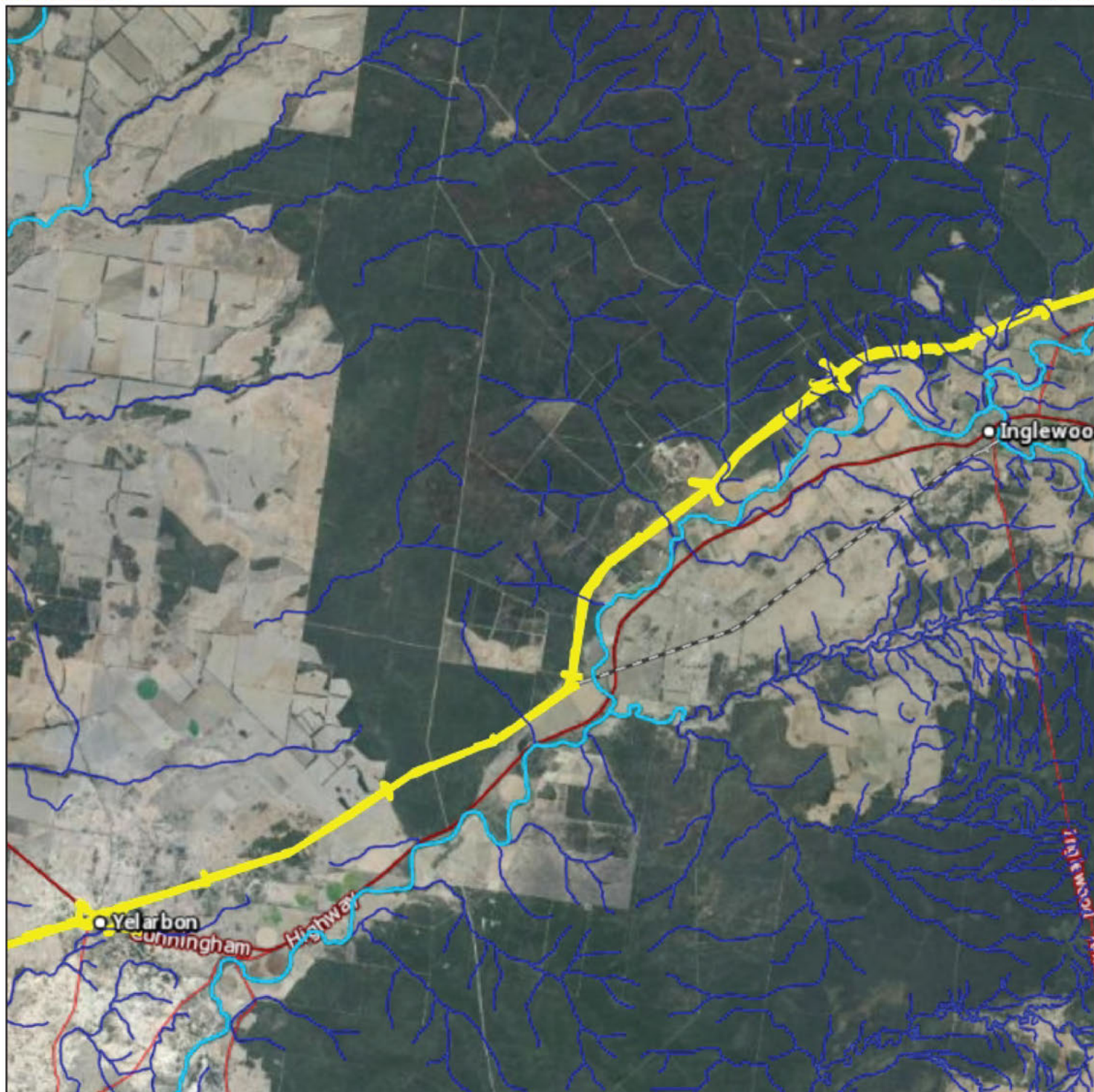
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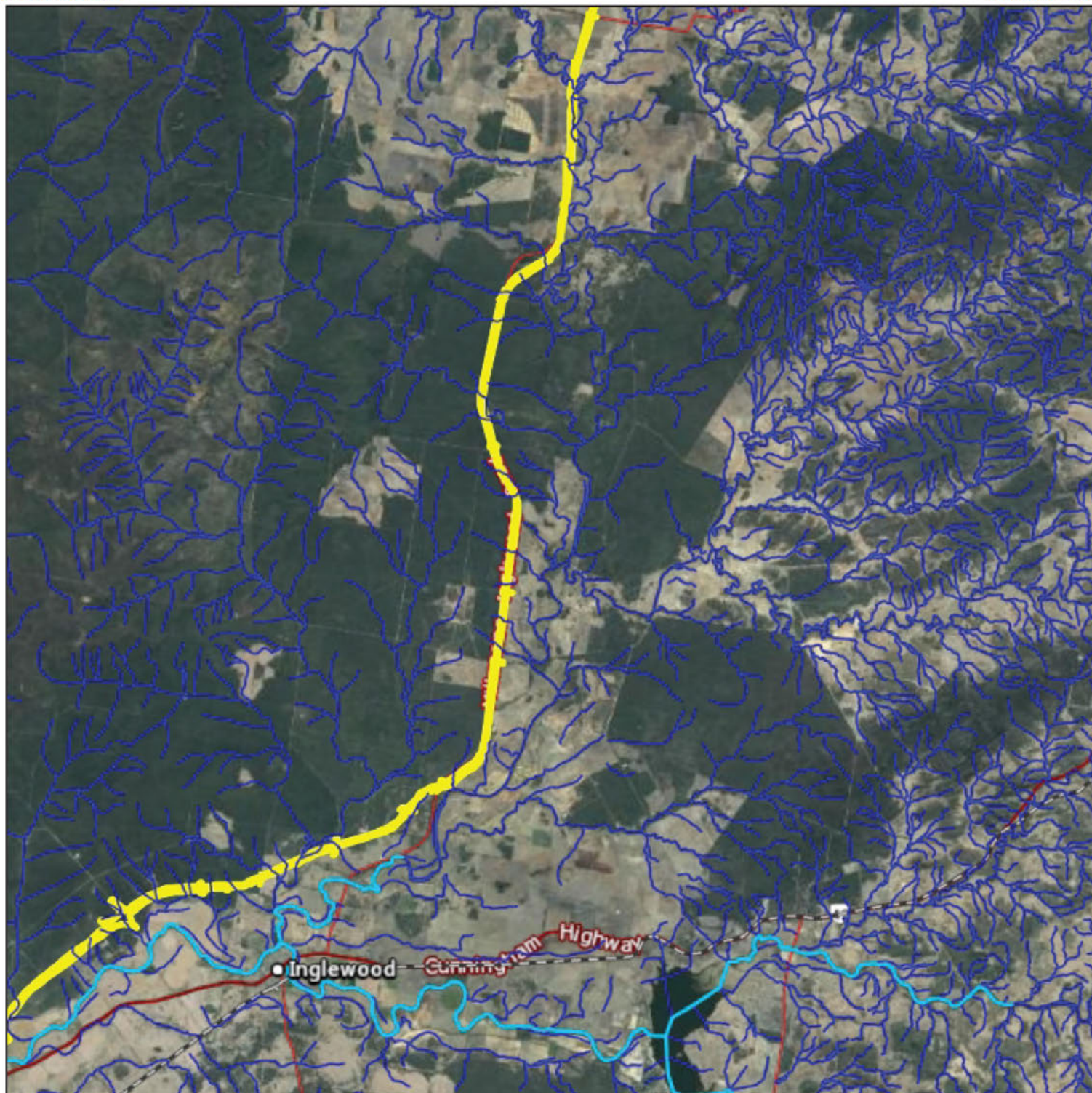
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28°6'15"S 151°22'48"E



28°27'21"S 150°58'51"E

28°27'21"S 151°22'48"E

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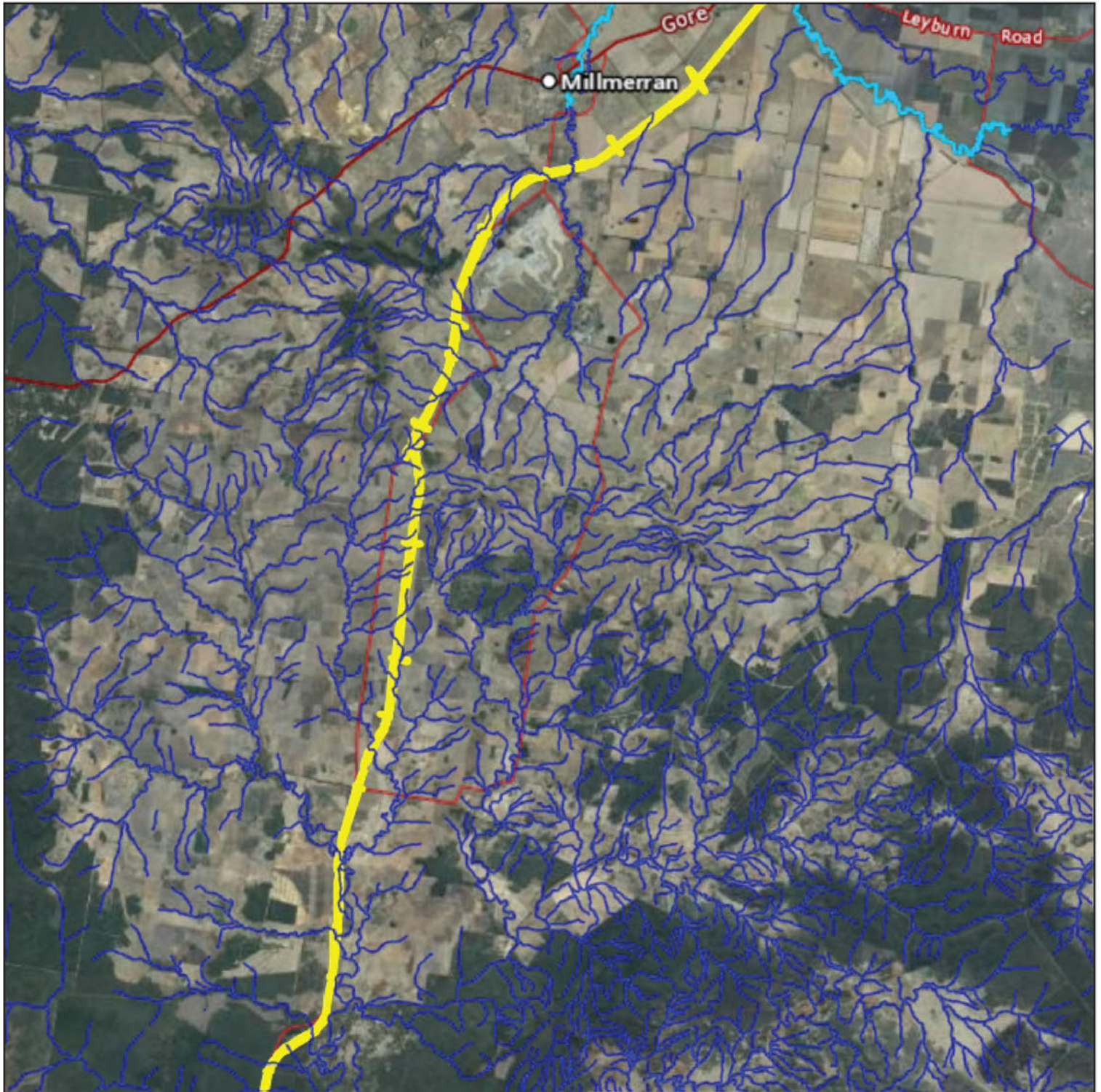
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27°51'11"S 151°27'54"E



28°12'20"S 151°3'56"E

28°12'20"S 151°27'54"E

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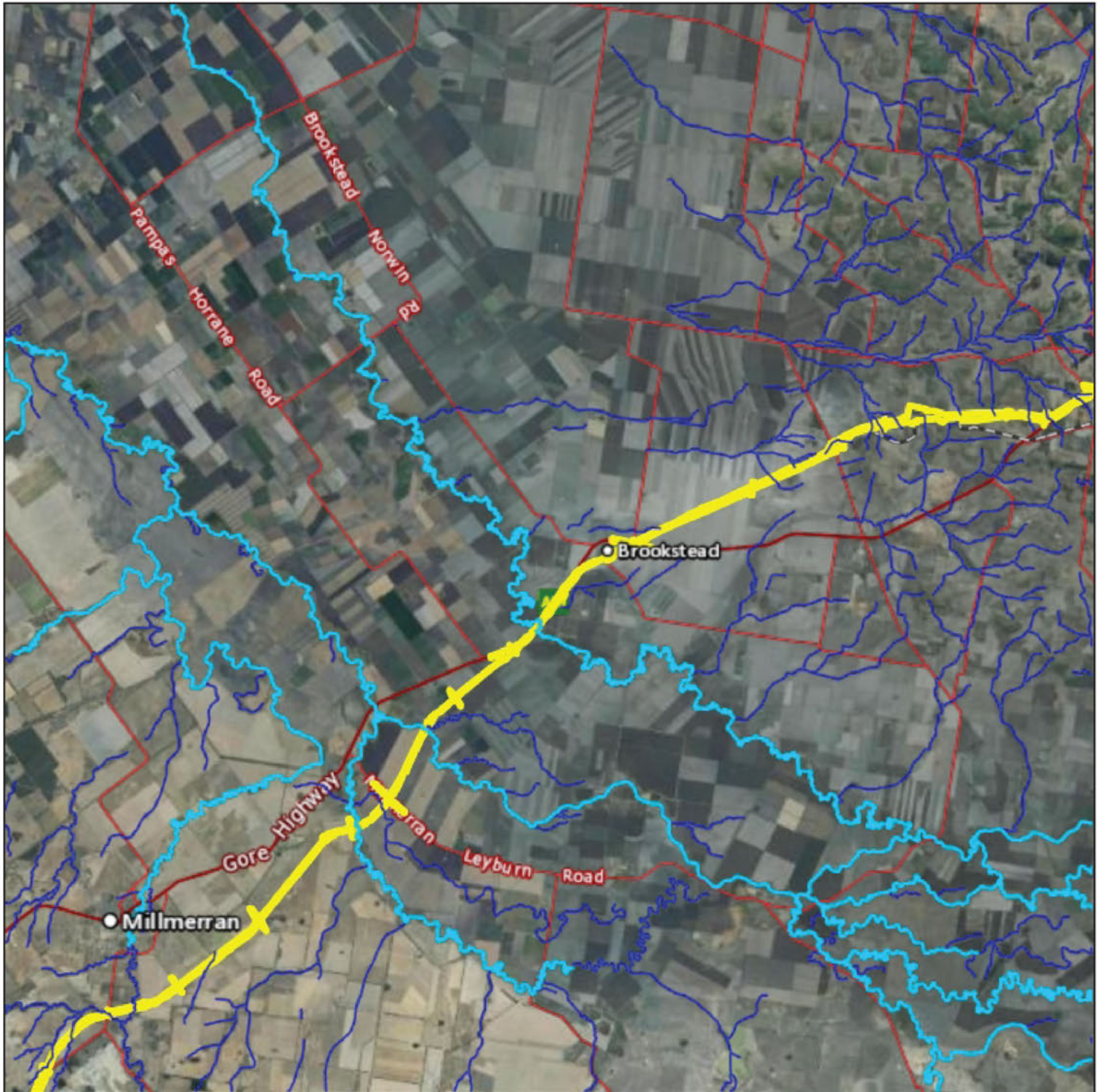
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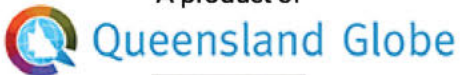
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27°56'1"S 151°13'37"E

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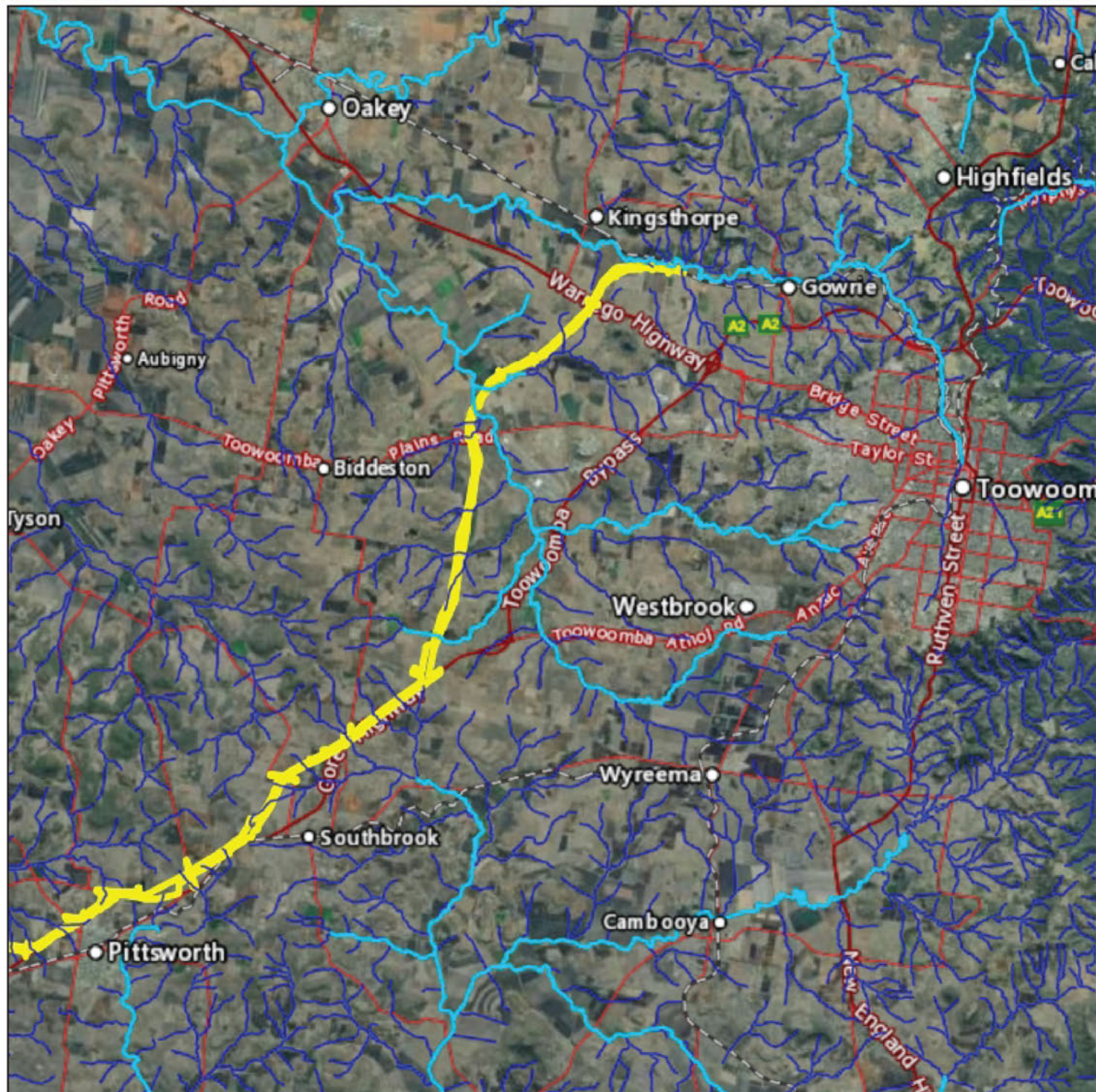
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B2G  
K\_IR\_3100000\_D\_CIV\_PL\_P  
ER\_DISTURBANCE\_FOOTPRIN  
T\_RevF.KMZ - poly



VM watercourse/drainage  
feature - 1:100 000 and 1:250  
000



VM watercourse/drainage -  
1:25 000



Spring [defined by Water Act  
2000]



Lake [defined by Water Act  
2000]



Downstream limit [defined by  
Water Act 2000]



Watercourse [defined by Water  
Act 2000]



Cities and Towns



Road

 Highway  Private

 Main

 Local

Railway



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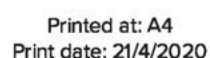
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28°16'9"S 150°45'26"E

28°16'9"S 151°9'23"E



28°37'13"S 150°45'26"E

28°37'13"S 151°9'23"E

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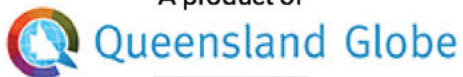
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28°26'38"S 151°24"E

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27°51'50"S 151°4'19"E

27°51'50"S 151°28'16"E



28°12'59"S 151°4'19"E

28°12'59"S 151°28'16"E

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27°35'31"S 151°13'52"E

27°35'31"S 151°37'50"E



27°56'43"S 151°13'52"E

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ER\_DISTURBANCE\_FOOTPRIN  
T\_RevF.KMZ - poly



Drainage Divisions



Drainage Basins



Drainage Sub-basins



Spring [defined by Water Act  
2000]



Lake [defined by Water Act  
2000]



Downstream limit [defined by  
Water Act 2000]



Watercourse [defined by Water  
Act 2000]



Coastline



Lake

Reservoir

Canal area

Watercourse line

- Major Watercourse
- Minor Watercourse
- Major Culvert
- Minor Culvert

Watercourse area

Water area edge



Road

- Highway
- Main
- Local
- Private

Cities and Towns



Railway



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27°27'20"S 151°26'9"E

27°27'20"S 151°50'7"E



27°48'34"S 151°26'9"E

27°48'34"S 151°50'7"E

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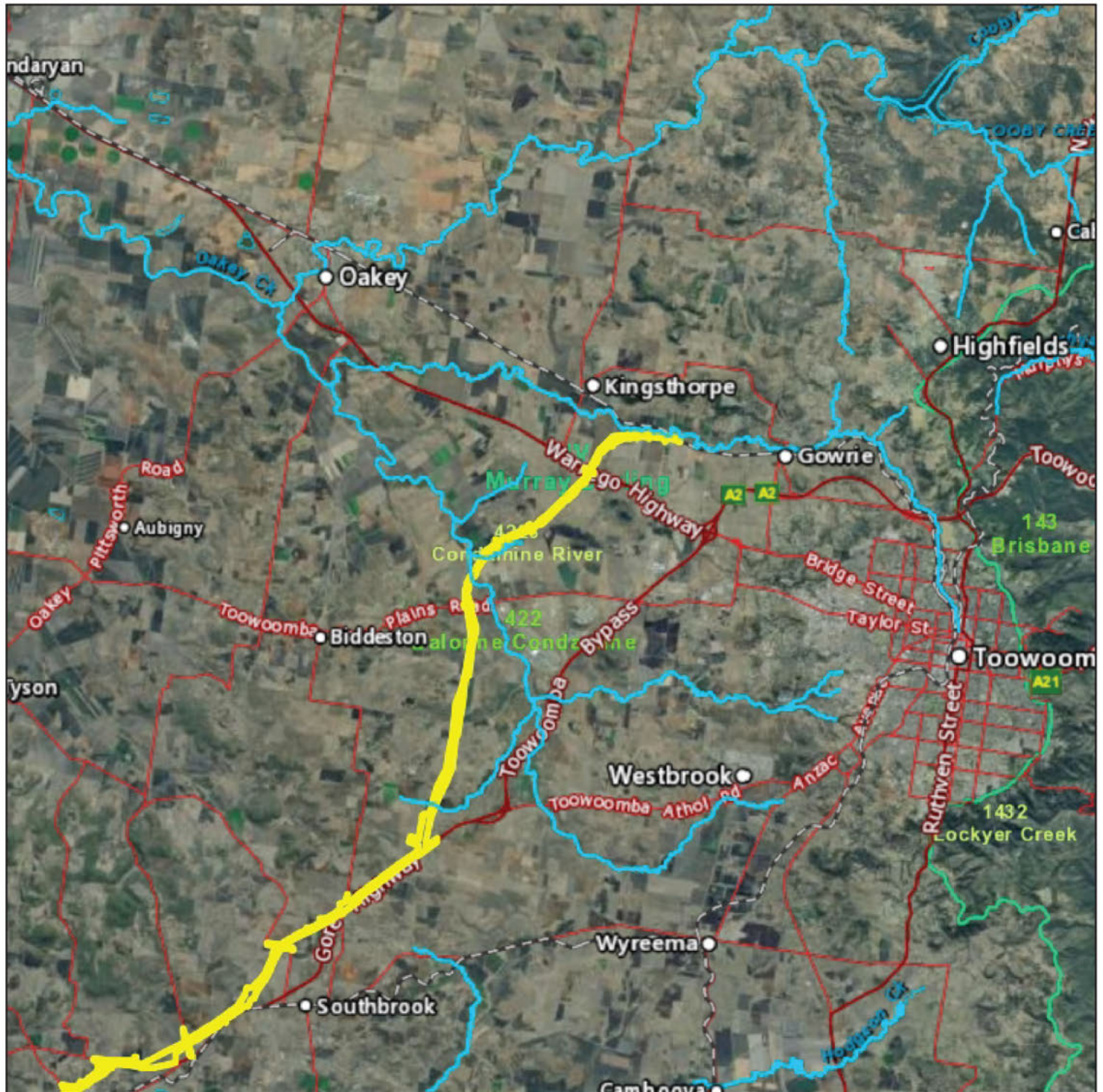
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ER\_DISTURBANCE\_FOOTPRIN  
T\_RevF.KMZ - poly



Drainage Divisions



Drainage Basins



Drainage Sub-basins



Coastline



Lake

Reservoir

Canal area

Watercourse line

- Major Watercourse
- Minor Watercourse
- Major Culvert
- Minor Culvert

Watercourse area

Water area edge



Spring [defined by Water  
Act 2000]



Lake [defined by Water Act  
2000]



Downstream limit [defined  
by Water Act 2000]



Watercourse [defined by  
Water Act 2000]



Road

- Highway
- Main
- Local
- Private

Cities and Towns



Railway



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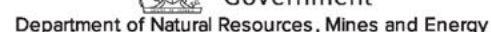
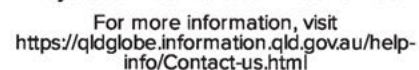




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**Water plan areas except  
GABORA**

**Water plan area Great Artesian  
Basin and Other Regional  
Aquifers [GABORA]**



**Water plan nodes**

-  Surface water node
-  Underground water node

**Water plan water supply  
scheme underground water  
trading zones**



**Water plan water supply  
schemes**



**Water plan surface water  
management area trading  
zones**



**Water plan surface water  
management areas**



**Water plan water licence  
seasonal water assignment  
zones**

**Water plan water licence  
relocation zones**



**Water plan underground  
water management area  
domestic areas**



**Water plan underground  
water management area  
watercourse bu er zones**



**Water plan underground  
water management area  
sub-areas**



**Water plan underground  
water management area  
noti cation areas**






**Water plan underground  
water management areas**



**Water plan overland ow  
areas**



**Water plan waterholes and  
lakes**

-  Augmented waterhole
-  Protected waterhole
-  Signi cant waterhole wetland

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- Upper Mitchell Zone 1
- Upper Mitchell Zone 2
- Upper Mitchell Zone 3

- Water plan prescribed and  
protected watercourses
- Prescribed watercourse
  - Protected watercourse



Water plan seawater intrusion zones

-  Seawater intrusion baseline
-  Seawater intrusion coastline

Water plan subcatchments



Water plan catchments



GABORA groundwater dependent ecosystem springs



GABORA groundwater dependent ecosystem watercourses



GABORA groundwater dependent ecosystem areas



GABORA bore corrosion areas



Hutton zone





Precipice zone



Springbok Walloon zone



Betts Creek beds

-  Betts Creek beds North
-  Betts Creek beds South

Bulimba Formation



Cadna-owie

-  Bungil
-  Eromanga Cadna-owie

Clematis

-  Bowen Clematis
-  Galilee Clematis

Hooray

-  Cape Gilbert River Aquifer
-  Carpentaria South Gilbert River Aquifer
-  Eromanga East Hooray
-  Eromanga North Hooray
-  Eromanga South Hooray
-  Eromanga West Hooray
-  Gubberamunda
-  Gulf Gilbert River Aquifer

Hutton

-  Crows Nest Marburg
-  Eastern Downs Marburg
-  Eromanga Hutton
-  Gatton Esk Road Marburg
-  Murphys Creek Marburg
-  Southern Clarence Moreton Marburg
-  Surat Hutton

Laura Gilbert River equivalents



Laura Rolling Downs



Mooga



Mulgildie North Hutton













Normanton








Winton Mackunda

-  Winton Mackunda North
-  Winton Mackunda South

Precipice

-  Crows Nest Woogaroo
-  Eastern Downs Precipice
-  Eromanga Precipice
-  Gatton Esk Road Woogaroo
-  Mulgildie North Precipice
-  Mulgildie South Precipice
-  Murphys Creek Woogaroo
-  Redbank Creek Woogaroo
-  Southern Clarence Moreton Woogaroo
-  Surat Precipice

Rolling Downs

-  Cape Rolling Downs
-  Carpentaria South Wallumbilla
-  Eromanga Wallumbilla
-  Gulf Rolling Downs
-  Surat Wallumbilla

Springbok Walloon

-  Adori Injune Creek
-  Eastern Downs Springbok Walloon
-  Southern Clarence Moreton Walloon
-  Surat Springbok Walloon

Wyaaba beds



Road

-  Highway
-  Main
-  Local
-  Private

Cities and Towns





27°17'13"S 150°16'5"E

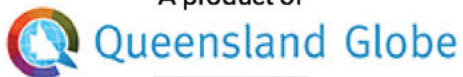
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28°51'20"S 150°16'5"E

28°51'20"S 152°2'45"E

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## Active springs

 Permanently active spring

 Intermittently active spring

## Inactive springs



## GAB spring net sites



## Springs - conservation significance

- Very High
- High
- Medium
- Very Low

## Road

 Highway

 Main

 Local

 Private

## Cities and Towns



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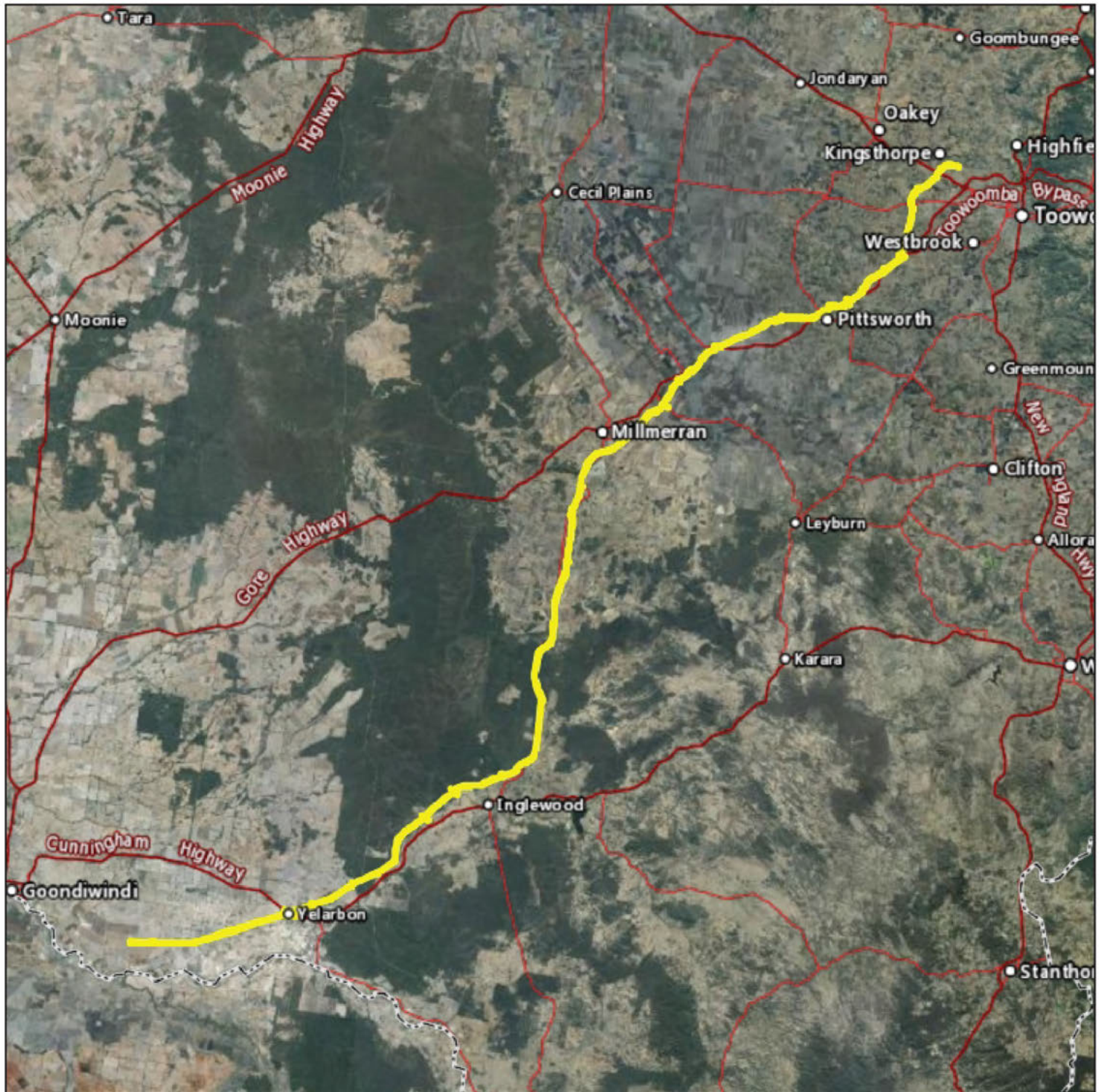
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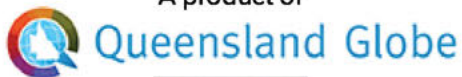
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28°49'44"S 150°17'28"E

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Fish habitat area

-  Management A boundary
-  Management B boundary

MSES declared fish habitat  
area [A and B areas]



Road

-  Highway
-  Main
-  Local
-  Private

Cities and Towns



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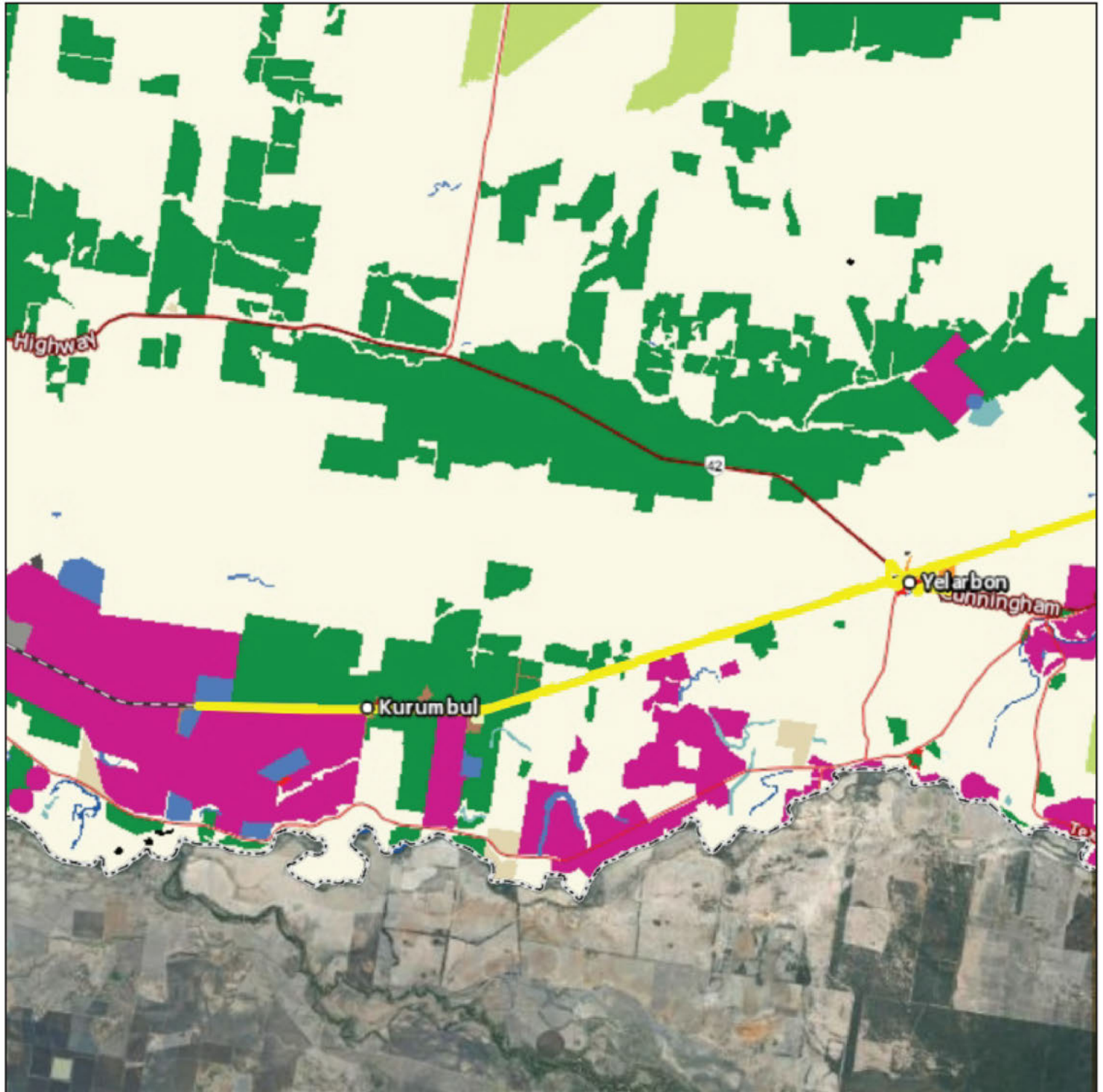
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28°23'16"S 150°25'18"E

28°23'16"S 150°49'16"E



28°44'18"S 150°25'18"E


28°44'18"S 150°49'16"E

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28°19'8"S 150°42'22"E

28°19'8"S 151°6'20"E

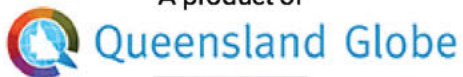


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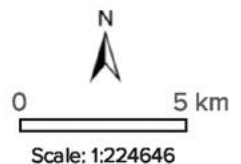
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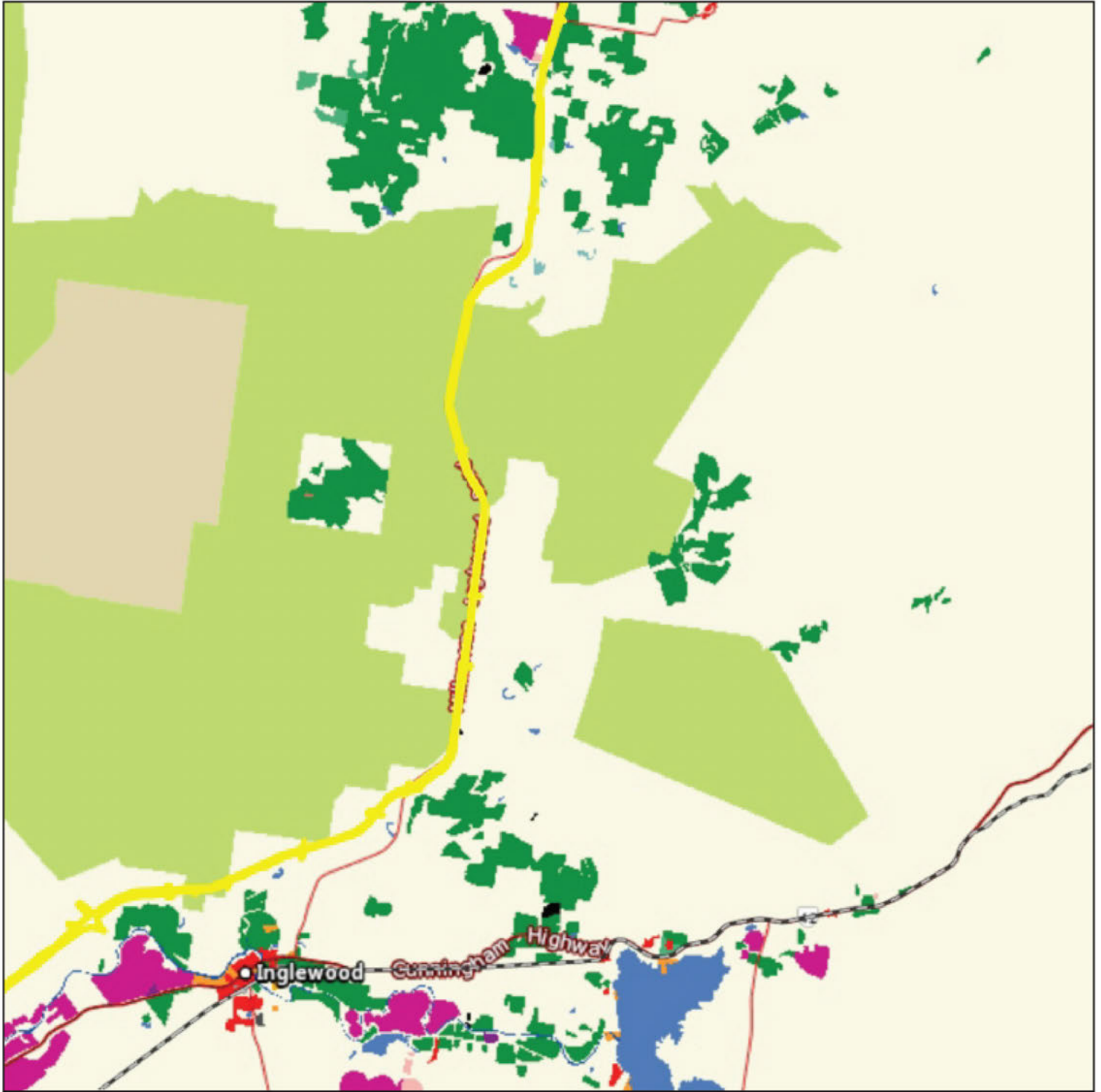
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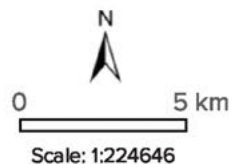


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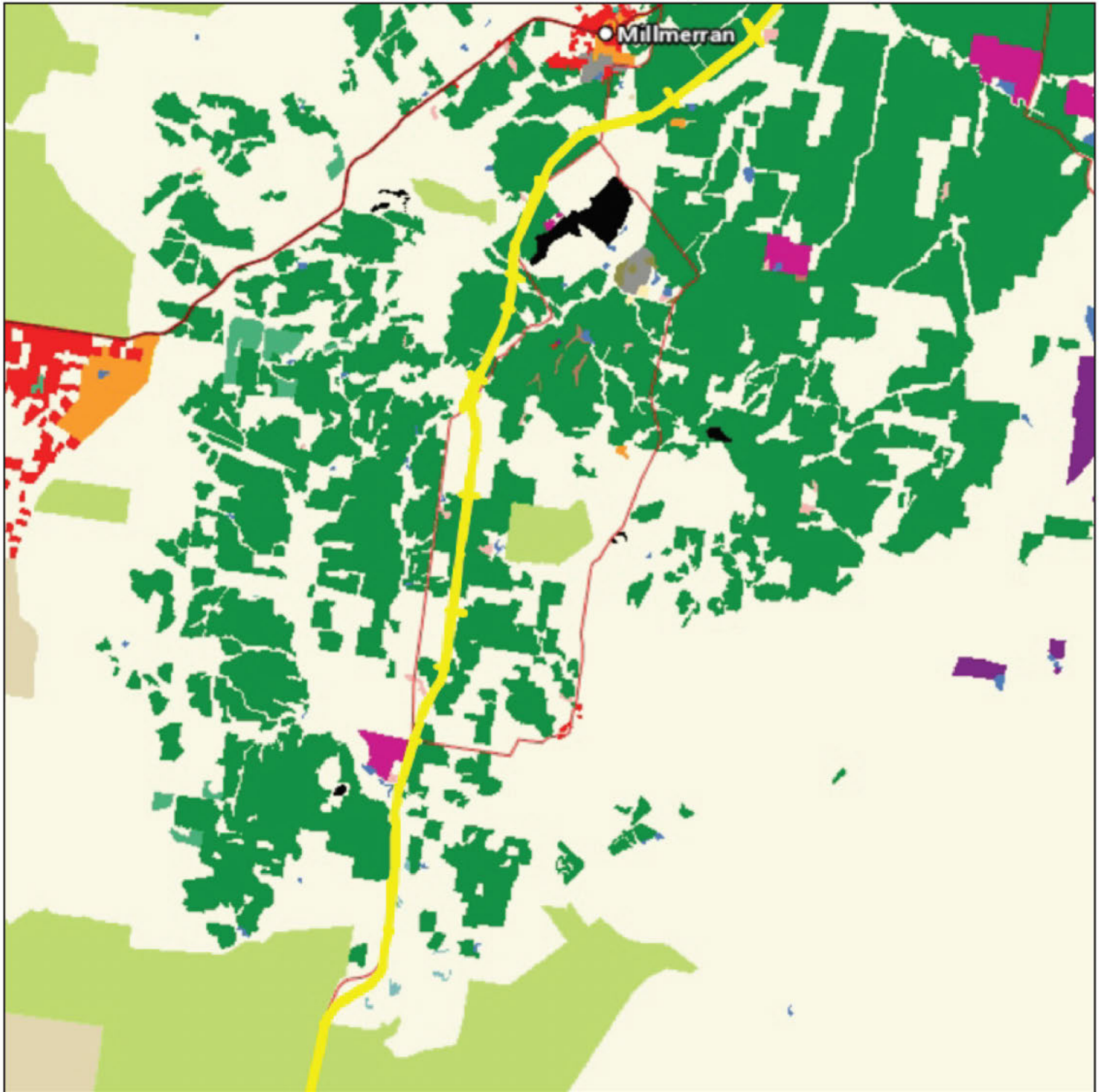
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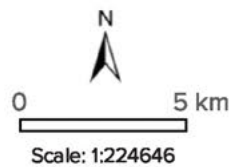
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28°13'15"S 151°26'40"E

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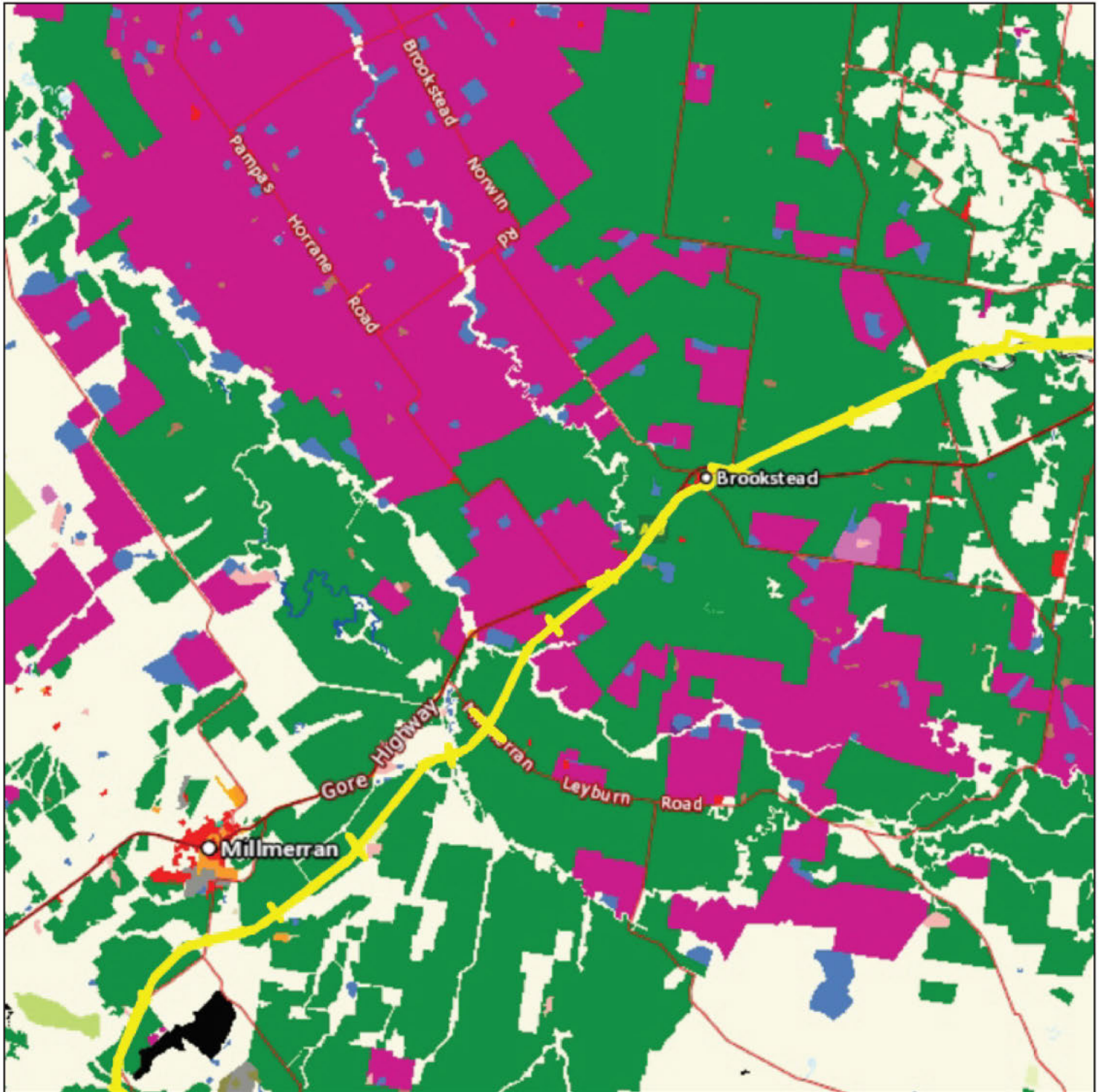
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27°36'14"S 151°11'26"E

27°36'14"S 151°35'24"E



27°57'26"S 151°11'26"E

27°57'26"S 151°35'24"E



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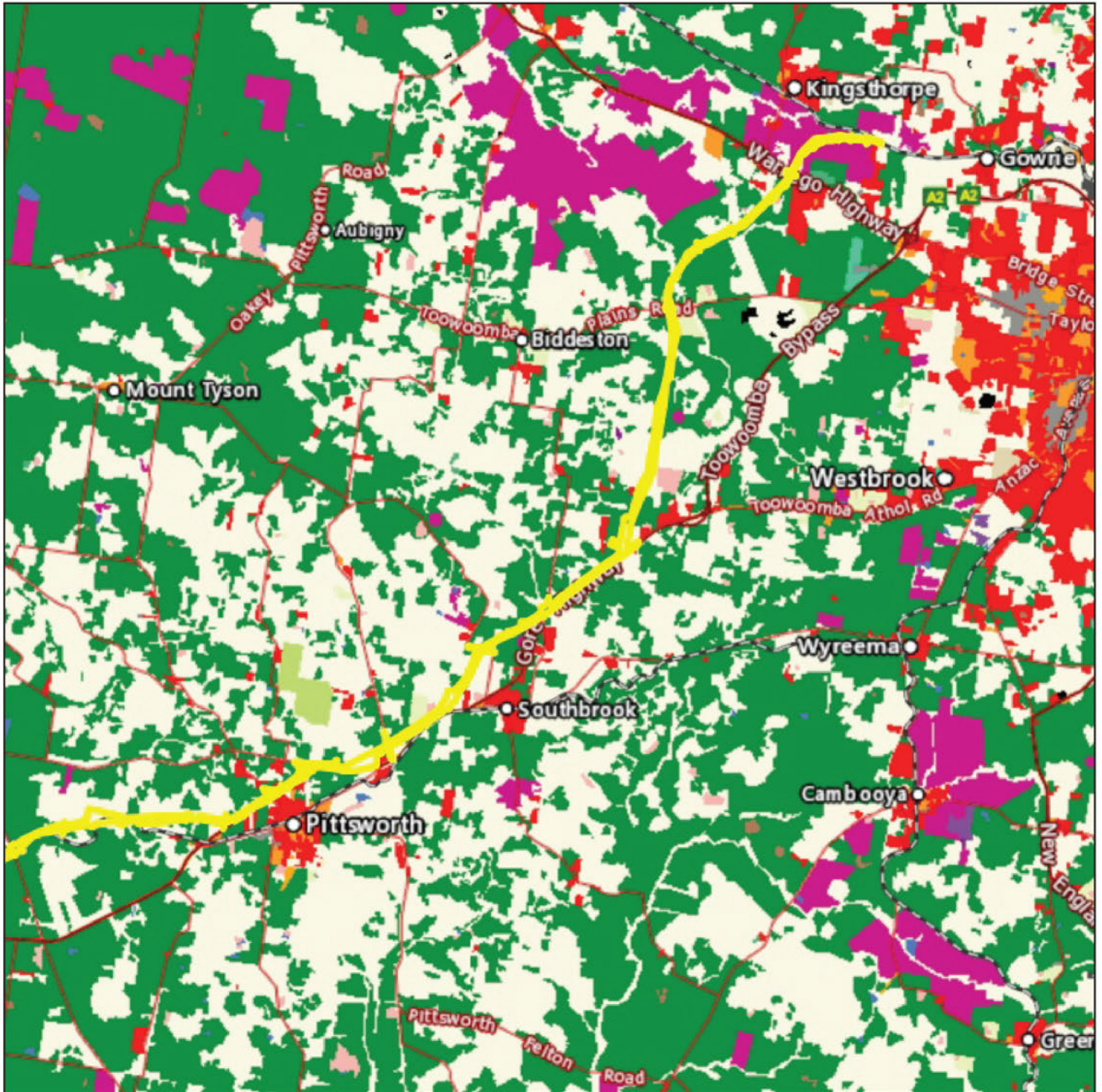
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27°26'56"S 151°31'42"E

27°26'56"S 151°55'40"E



27°48'10"S 151°31'42"E

27°48'10"S 151°55'40"E

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### Road

-  Highway
-  Main
-  Local
-  Private



### Cities and Towns



### Railway



### Queensland Land Use - Current

-  Nature conservation
-  Managed resource protection
-  Other minimal use
-  Grazing native vegetation
-  Production forestry
-  Plantation forestry
-  Grazing modified pastures
-  Cropping
-  Perennial horticulture
-  Seasonal horticulture
-  Land in transition
-  Irrigated plantation forestry
-  Irrigated modified pastures
-  Irrigated cropping
-  Irrigated perennial horticulture
-  Irrigated seasonal horticulture
-  Irrigated land in transition
-  Intensive horticulture
-  Intensive animal husbandry
-  Manufacturing and industrial
-  Residential
-  Services
-  Utilities
-  Transport and communication
-  Mining
-  Waste treatment and disposal

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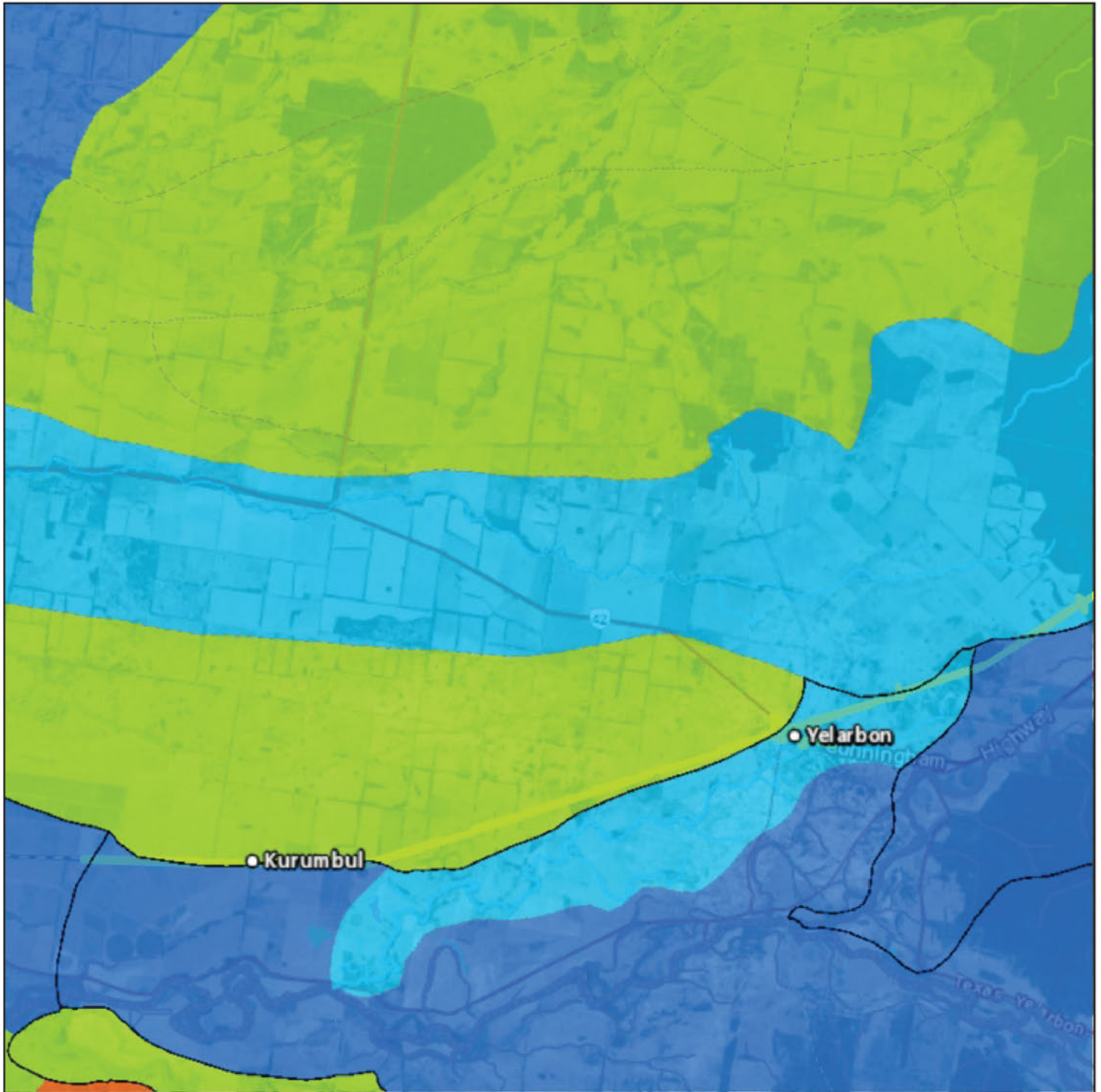
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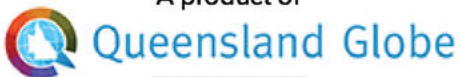
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28°41'21"S 150°27'48"E

28°41'21"S 150°51'46"E

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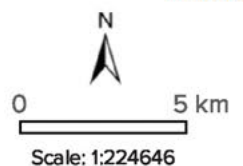


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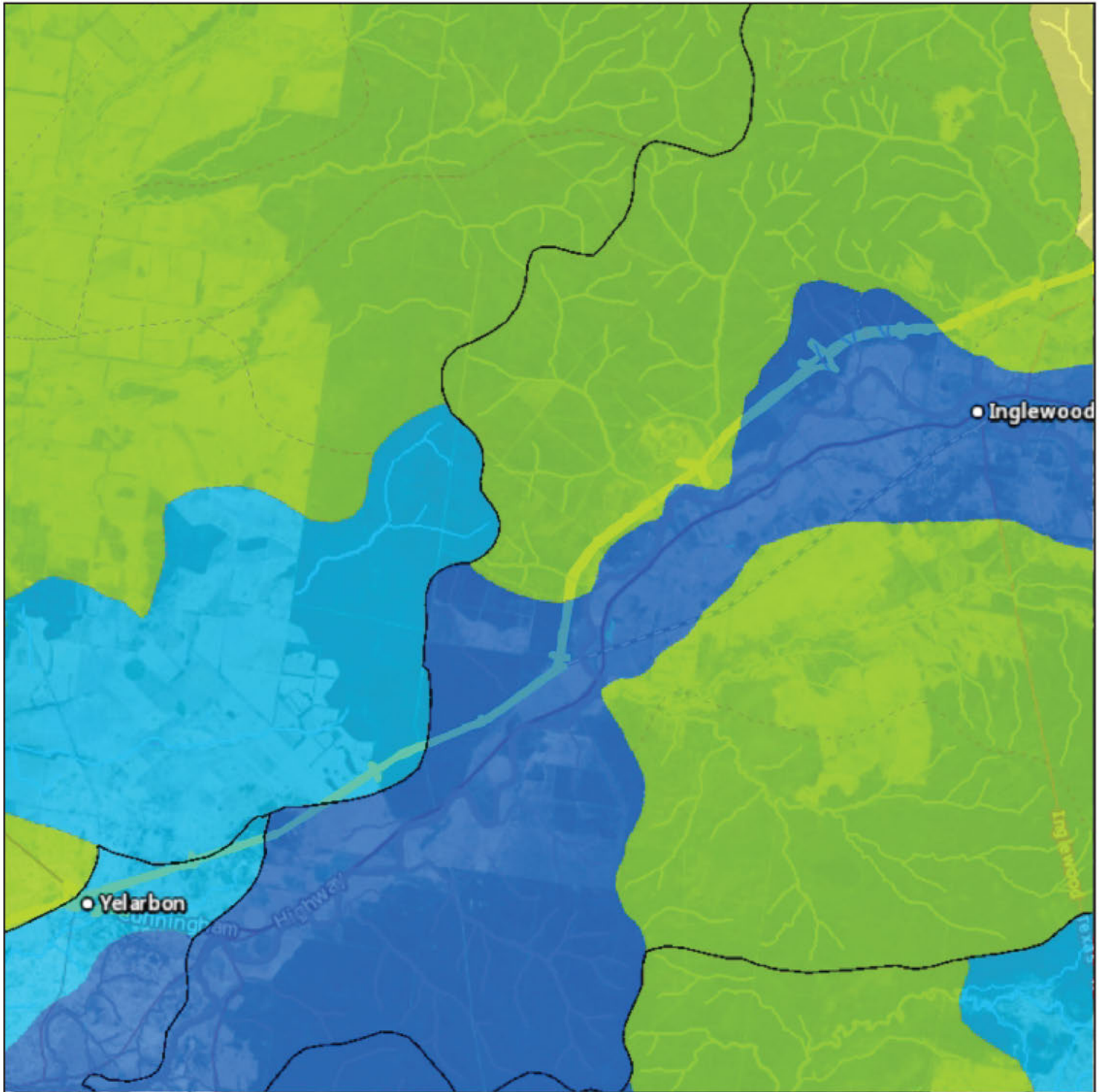
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28°17'2"S 150°43'23"E

28°17'2"S 151°7'20"E



28°38'6"S 150°43'23"E

28°38'6"S 151°7'20"E

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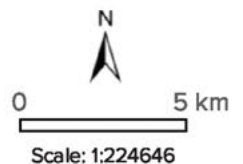


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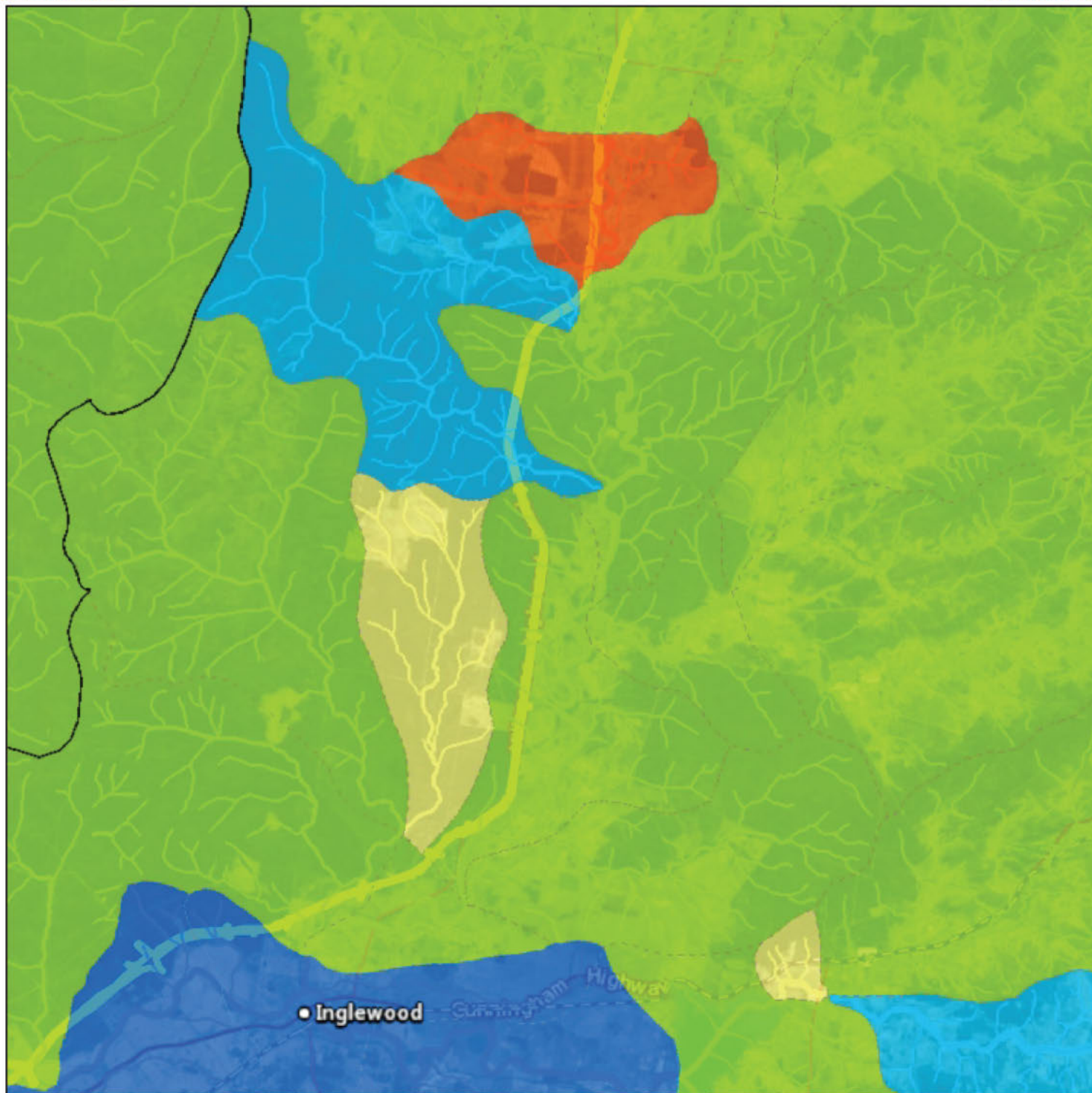


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28°5'24"S 150°58'16"E

28°5'24"S 151°22'13"E



28°26'31"S 150°58'16"E

28°26'31"S 151°22'13"E



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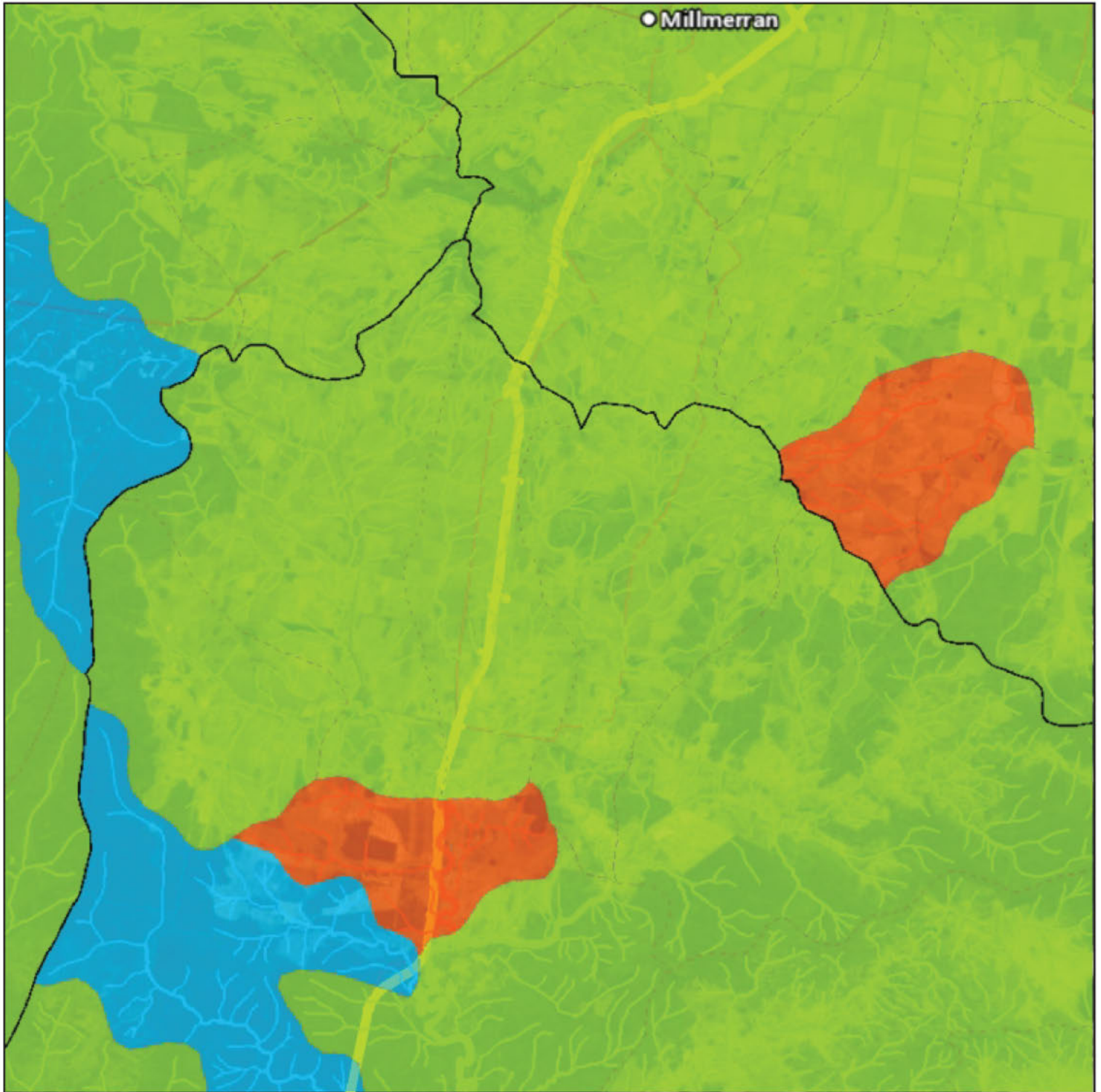
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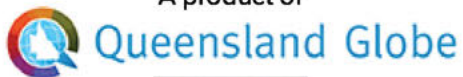
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27°52'24"S 151°25'42"E



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28°13'32"S 151°25'42"E

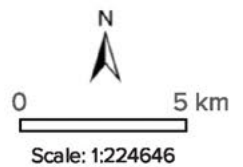


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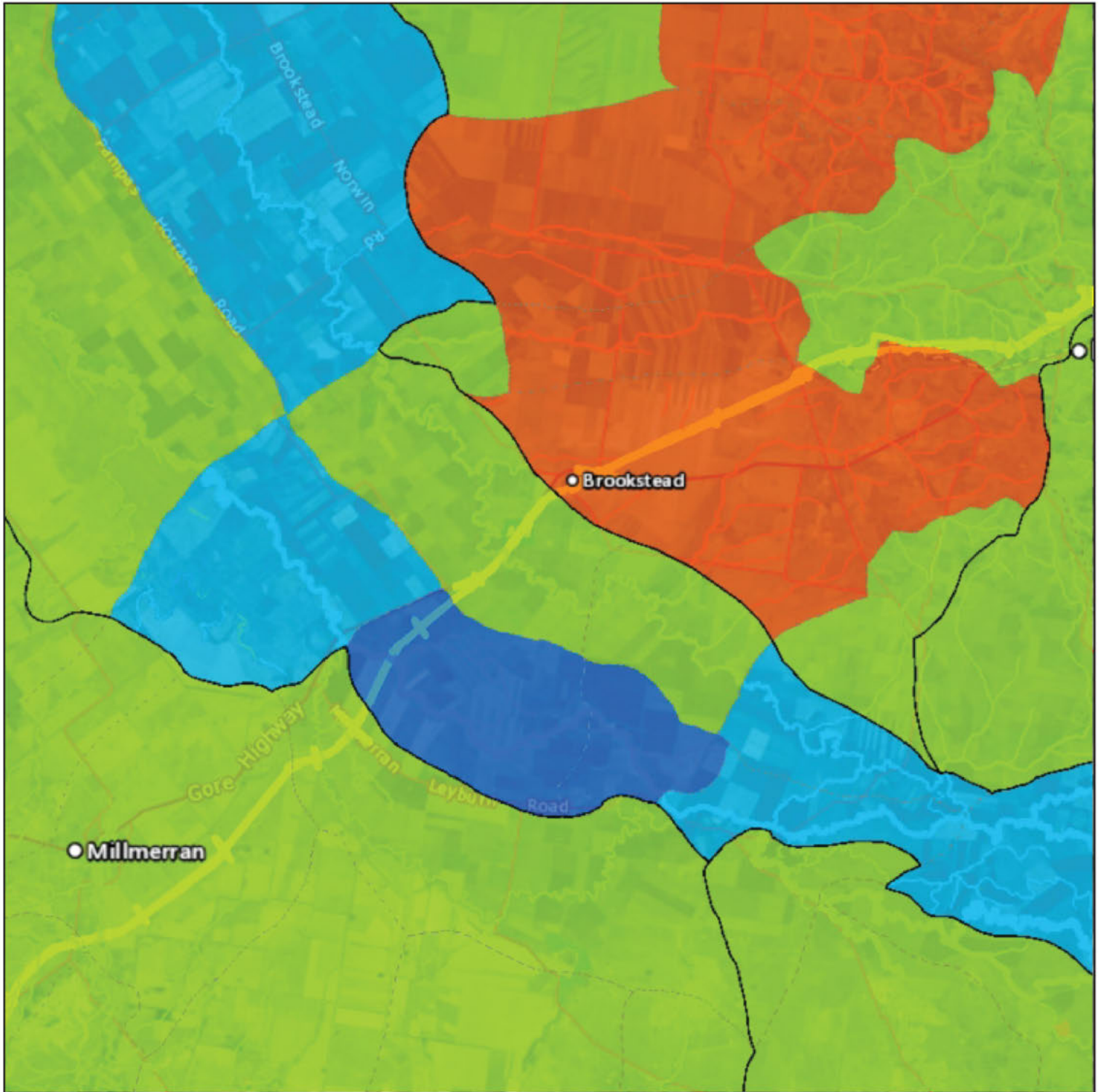
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27°36'11"S 151°14'23"E

27°36'11"S 151°38'21"E



27°57'23"S 151°14'23"E

27°57'23"S 151°38'21"E

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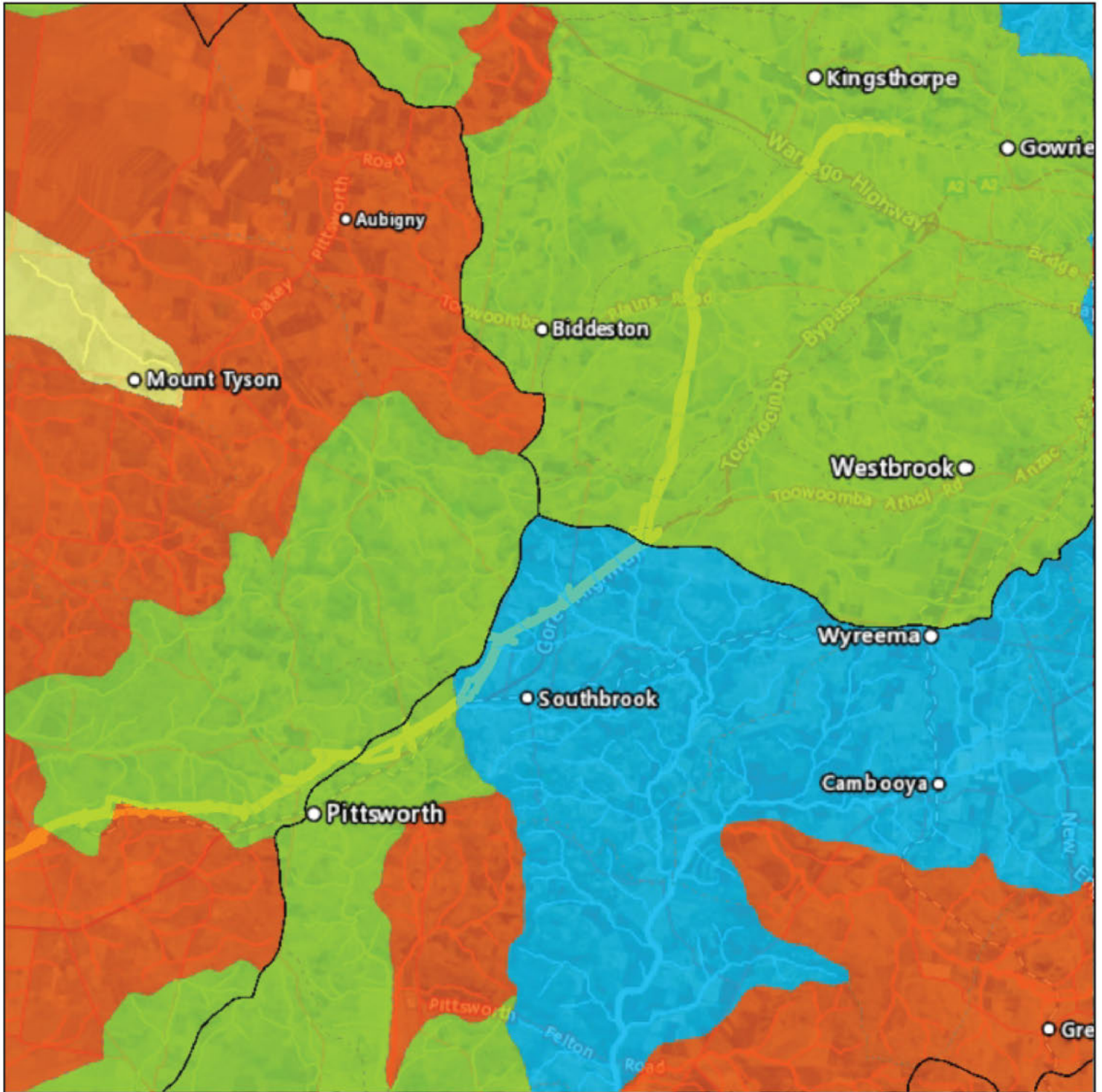
**Queensland**  
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27°27'8"S 151°55'12"E

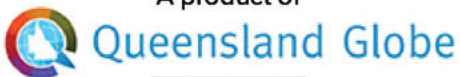


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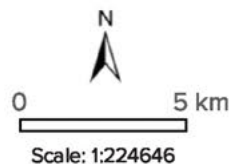
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B2G  
K\_IR\_3100000\_D\_CIV\_PL\_P  
ER\_DISTURBANCE\_FOOTPRIN  
T\_RevF.KMZ - poly






Riverine subcatchments







Riverine subsections



Bu ered streams -  
conservation signi cance

-  Very High
-  High
-  Medium
-  Low
-  Very Low

Riverine spatial units -  
conservation signi cance

-  Very High
-  High
-  Medium
-  Low
-  Very Low





Non-riverine subcatchments








Non-riverine subsections



Springs - conservation  
signi cance

-  Very High
-  High
-  Medium
-  Very Low

Non-riverine wetlands -  
conservation signi cance

-  Very High
-  High
-  Medium
-  Low
-  Very Low

Railway



Cities and Towns



Road

-  Highway
-  Main
-  Local
-  Private

Earthstar Geographics

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## Queensland Land Use - Current (cont)

-  Lake
-  Reservoir/dam
-  River
-  Channel/aqueduct
-  Marsh/wetland
-  Estuary/coastal waters

28°19'37"S 150°28'44"E

28°19'37"S 150°52'42"E



28°40'41"S 150°28'44"E

28°40'41"S 150°52'42"E

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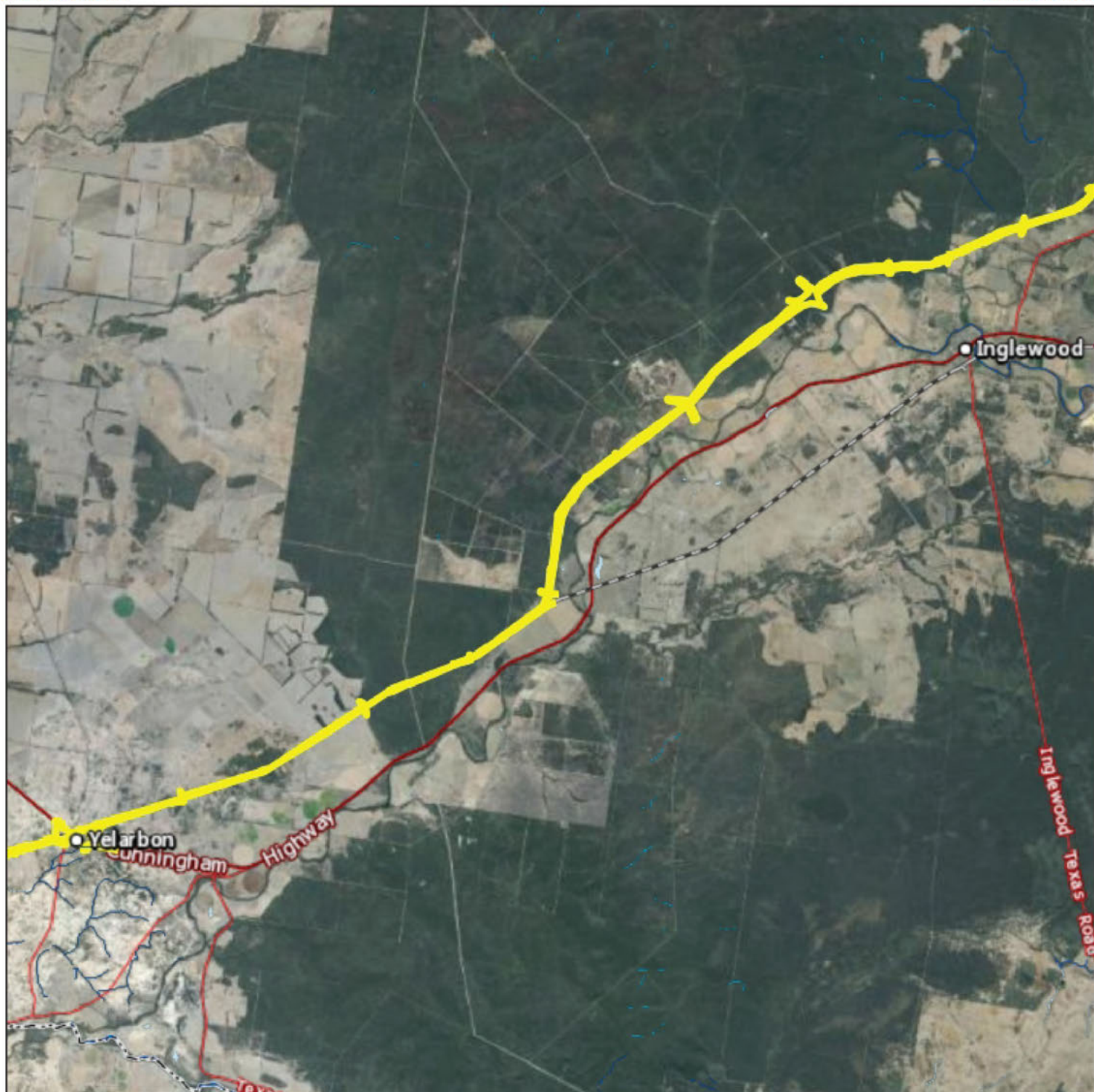
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28°18'18"S 150°43'40"E

28°18'18"S 151°7'38"E



28°39'22"S 150°43'40"E

28°39'22"S 151°7'38"E

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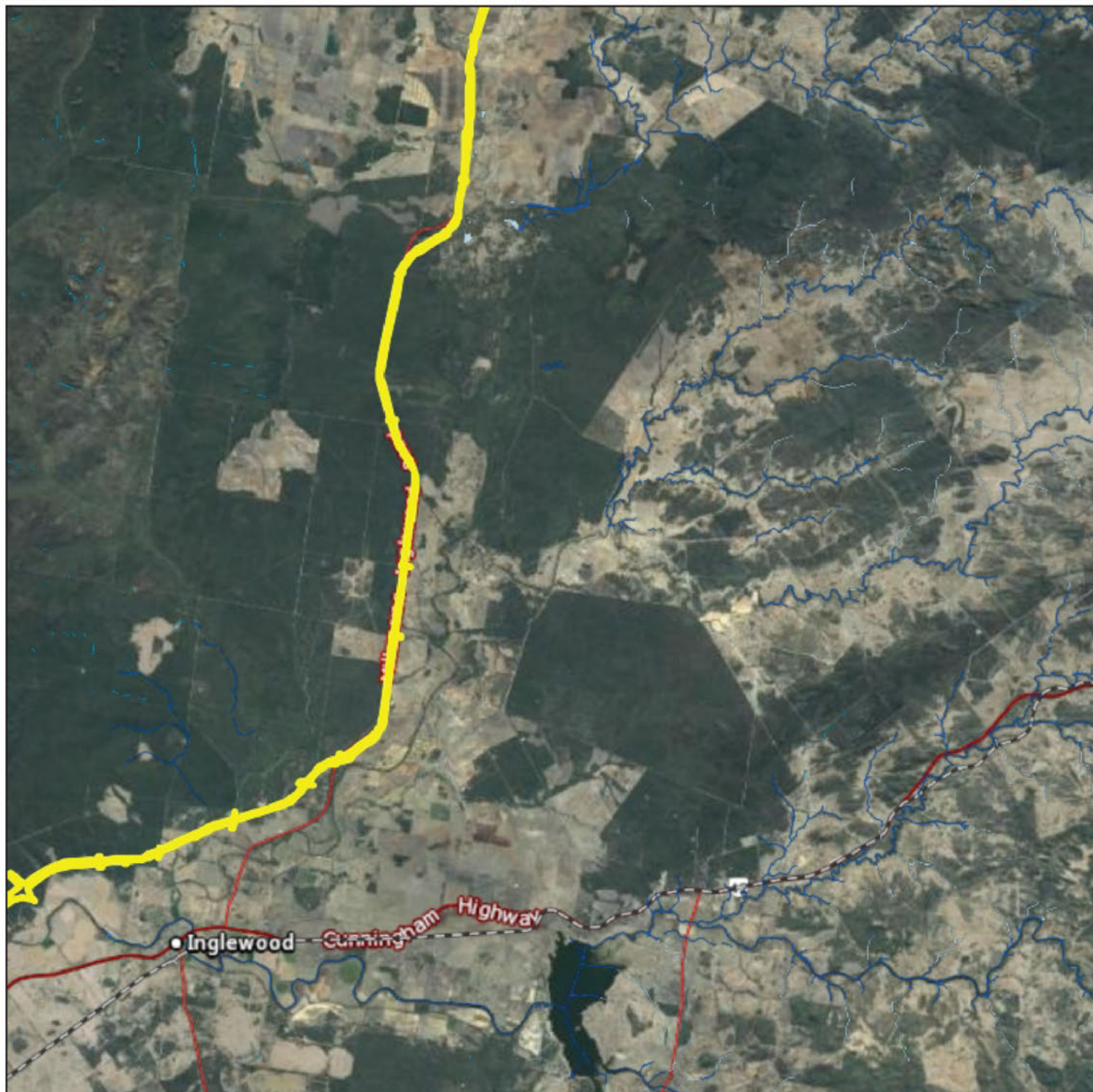
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Government

Department of Natural Resources, Mines and Energy



28°6'45"S 151°1'5"E

28°6'45"S 151°25'3"E



28°27'51"S 151°1'5"E

28°27'51"S 151°25'3"E

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27°53'34"S 151°5'36"E

27°53'34"S 151°29'34"E



28°14'42"S 151°5'36"E

28°14'42"S 151°29'34"E

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27°37'8"S 151°14'32"E

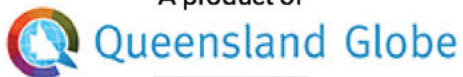
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27°58'20"S 151°14'32"E

27°58'20"S 151°38'30"E

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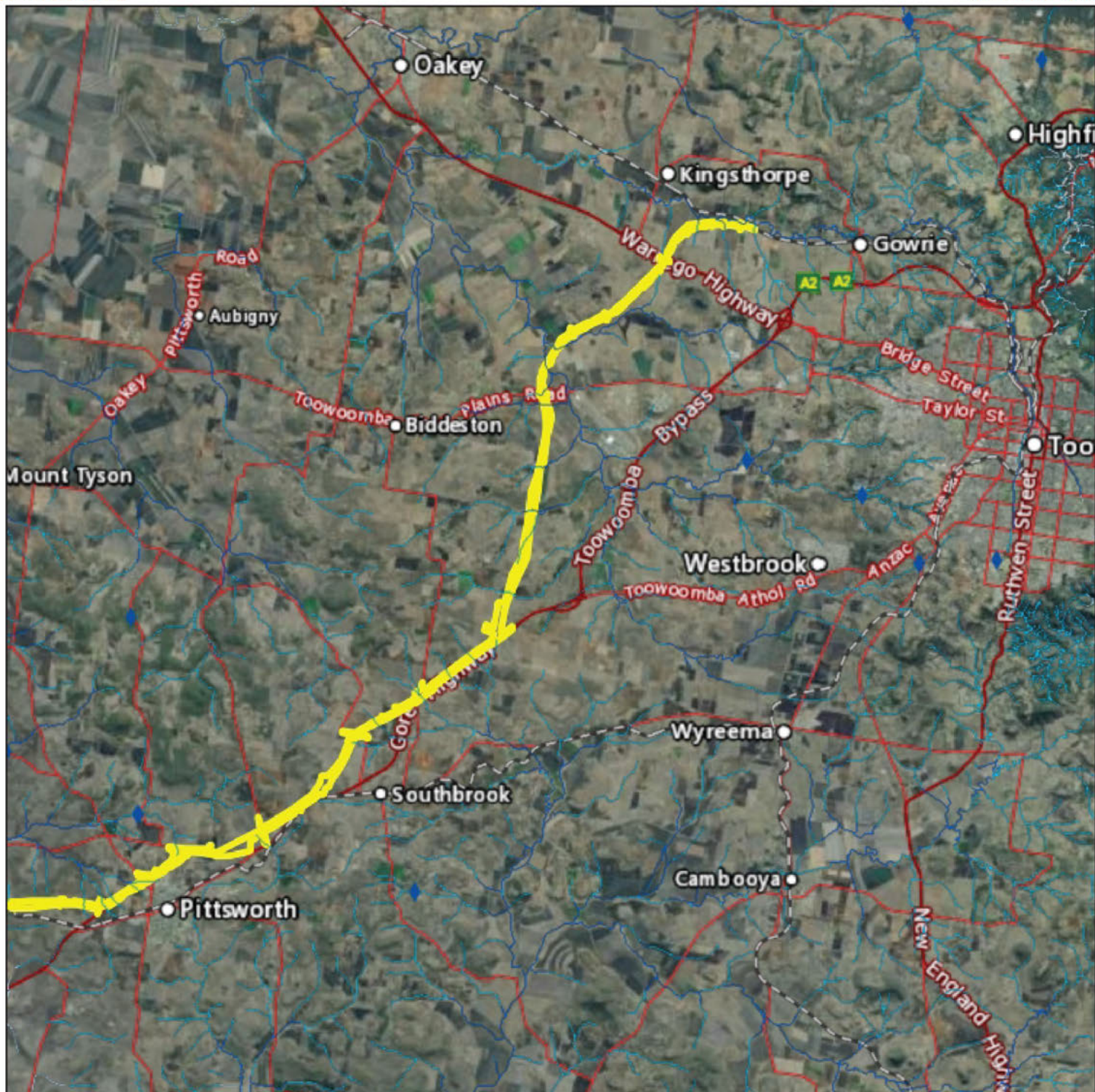
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## B2G

K\_IR\_3100000\_D\_CIV\_PL\_P  
ER\_DISTURBANCE\_FOOTPRIN  
T\_RevF.KMZ - poly



## Surface GDE points [spring ecosystems]

- ◆ Known GDE
- ◆ Derived GDE - moderate confidence

## Surface GDE lines

- Known GDE
- Derived GDE - high confidence
- Derived GDE - moderate confidence
- Derived GDE - low confidence

## Surface GDE areas

- 81-100% Known GDE
- 81-100% Derived GDE - high confidence
- 81-100% Derived GDE - moderate confidence
- 81-100% Derived GDE - low confidence
- ▨ 01-80% Derived GDE - high confidence
- ▨ 01-80% Derived GDE - moderate confidence
- ▨ 01-80% Derived GDE - low confidence

## Road

- Highway
- Main
- Local
- Private

## Railway



## Cities and Towns



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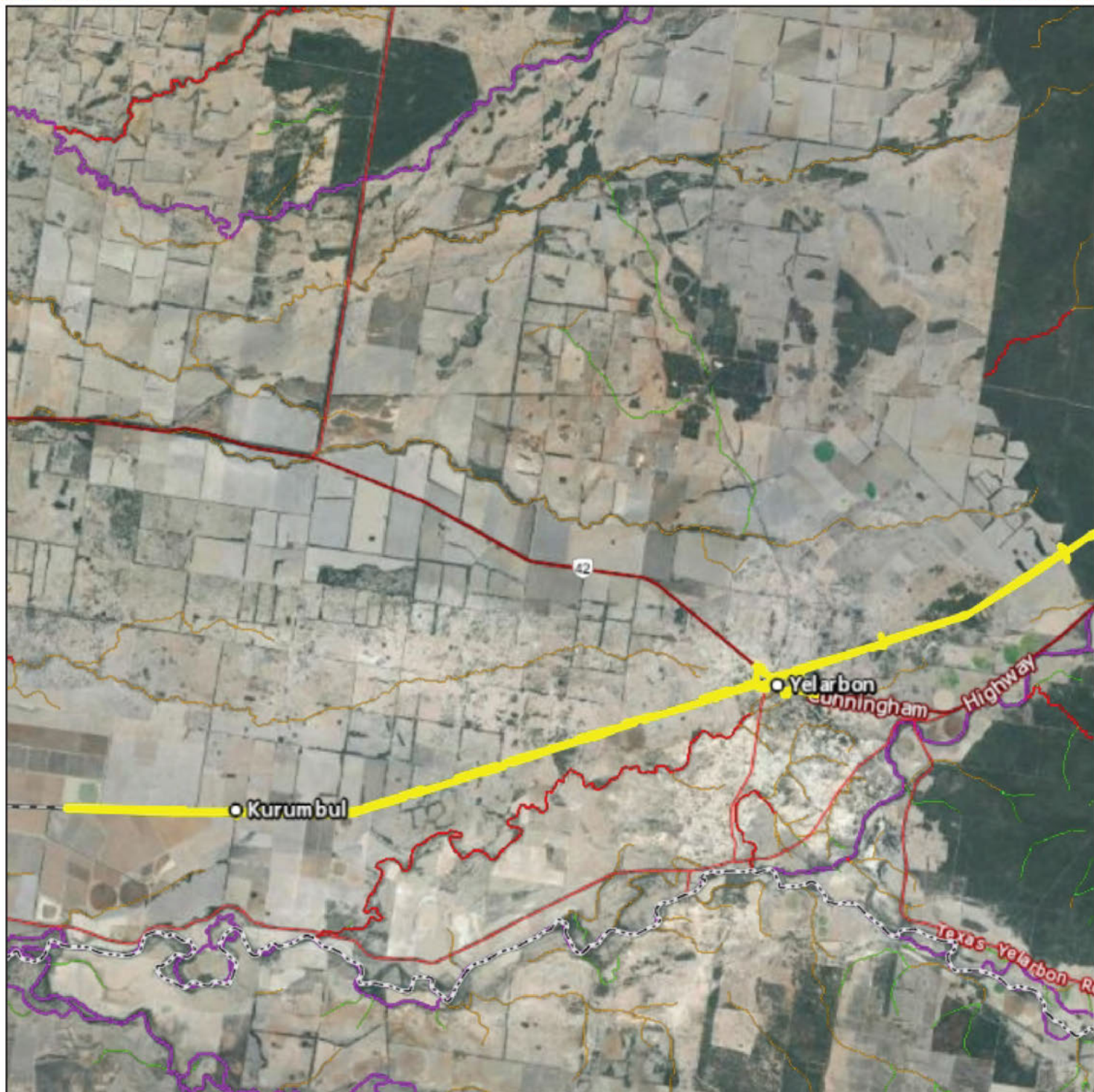
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28°21'19"S 150°28'12"E

28°21'19"S 150°52'10"E



28°42'22"S 150°28'12"E

28°42'22"S 150°52'10"E

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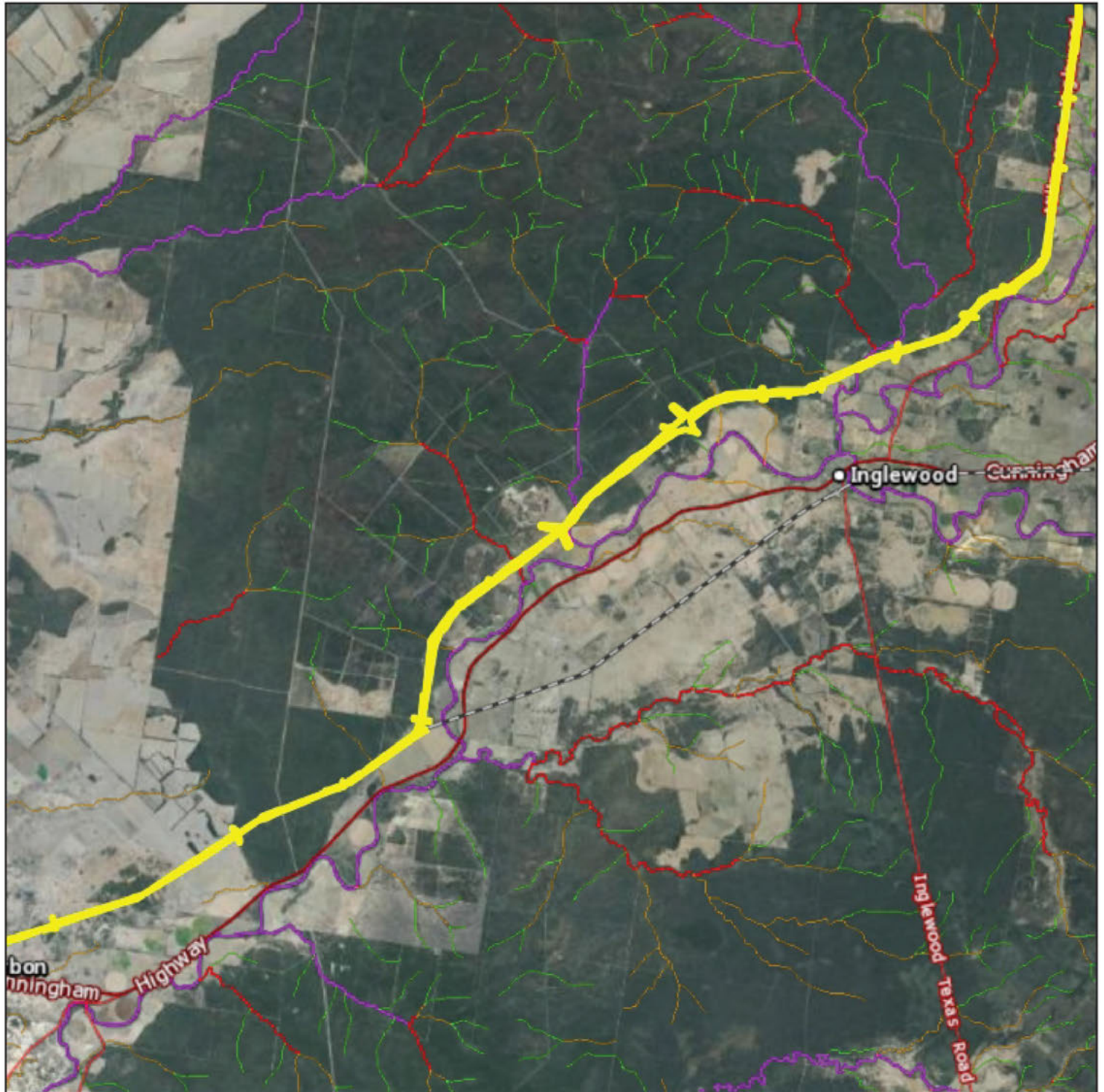
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28°15'48"S 150°46'28"E

28°15'48"S 151°10'26"E

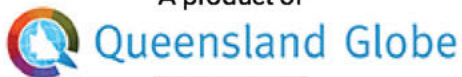


28°36'52"S 150°46'28"E

28°36'52"S 151°10'26"E

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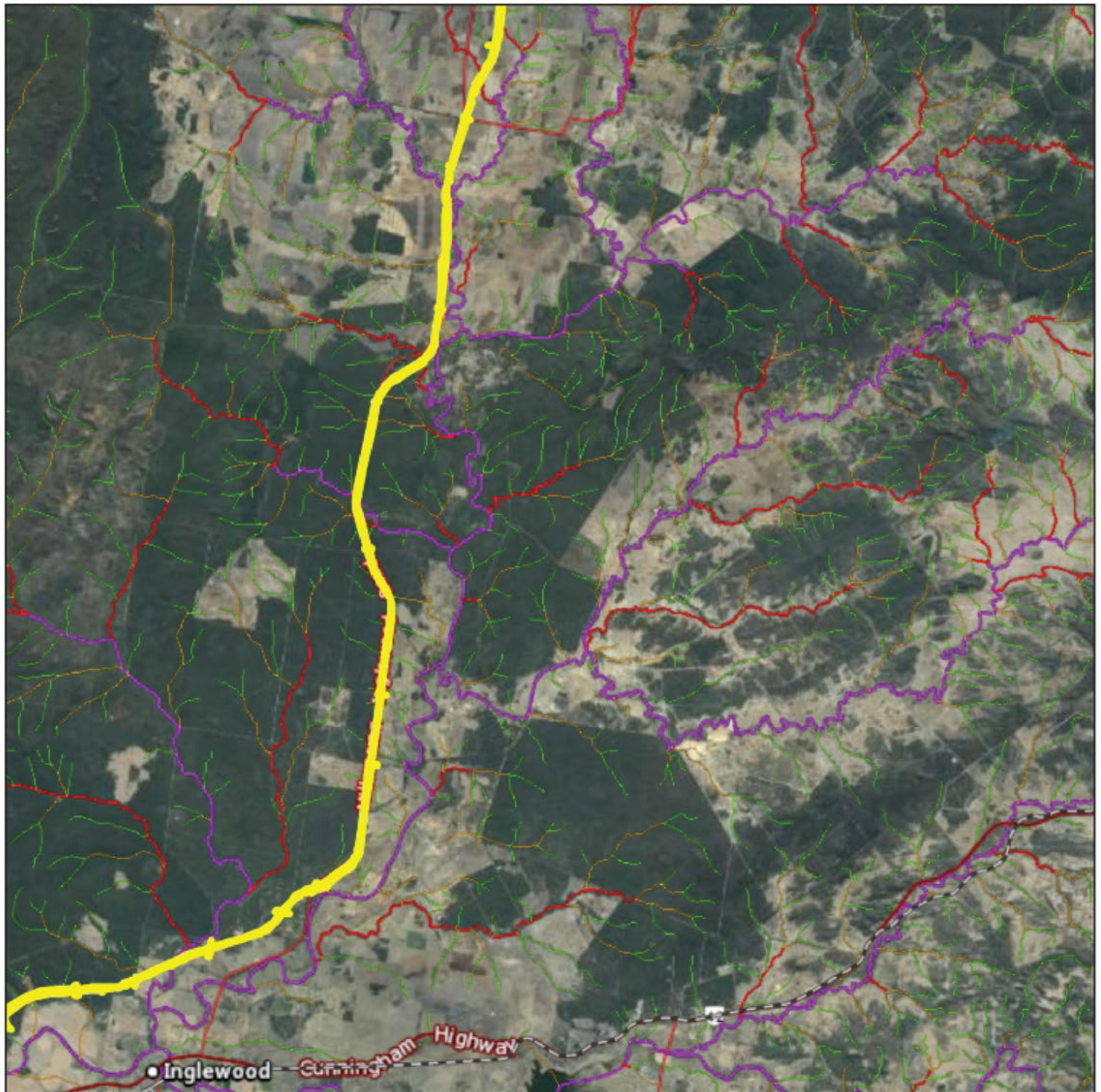
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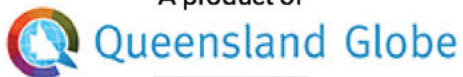
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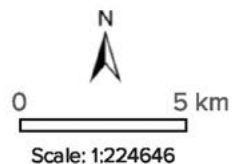


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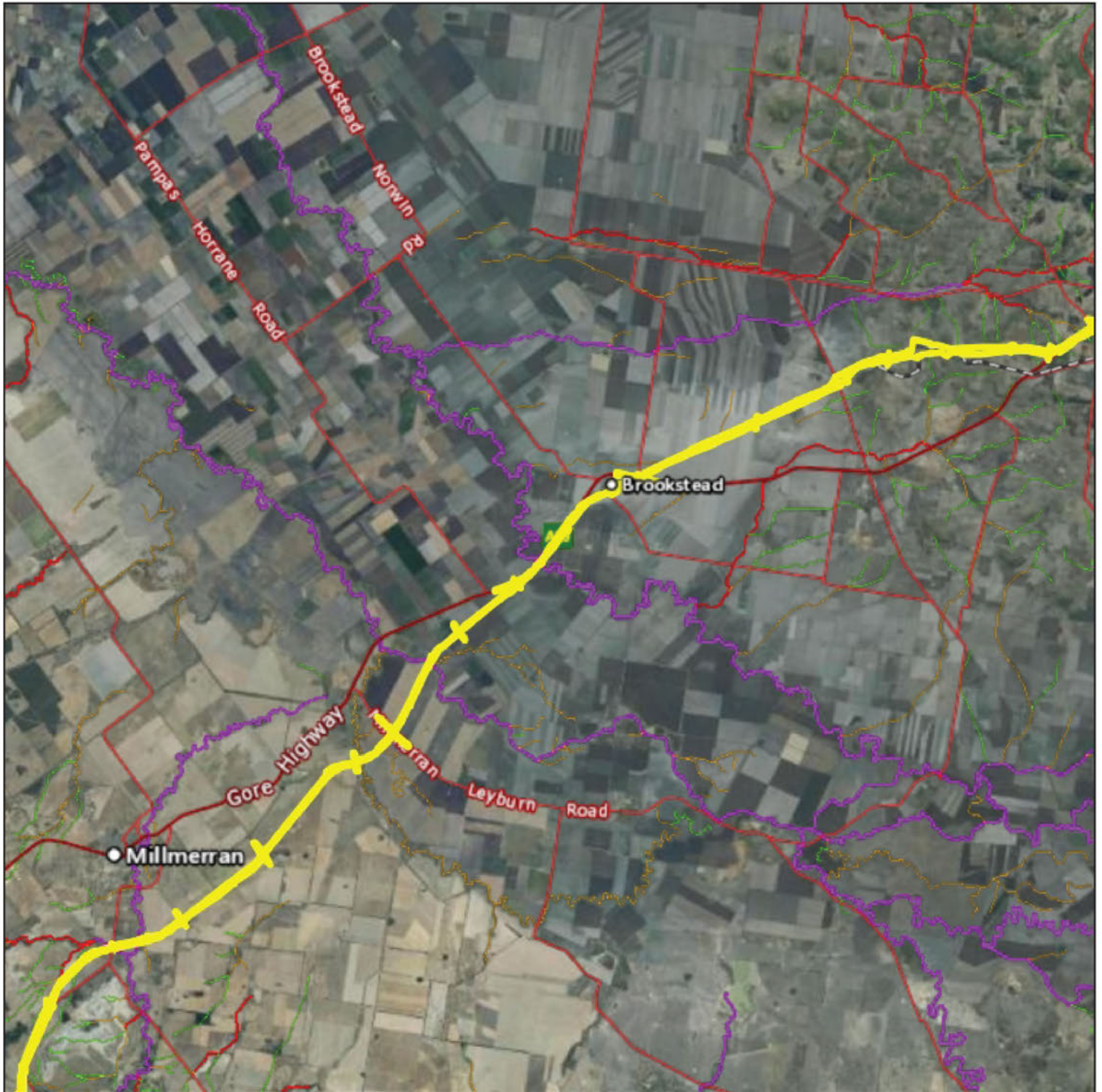
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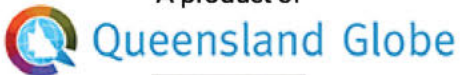
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27°57'18"S 151°13'31"E

27°57'18"S 151°37'29"E

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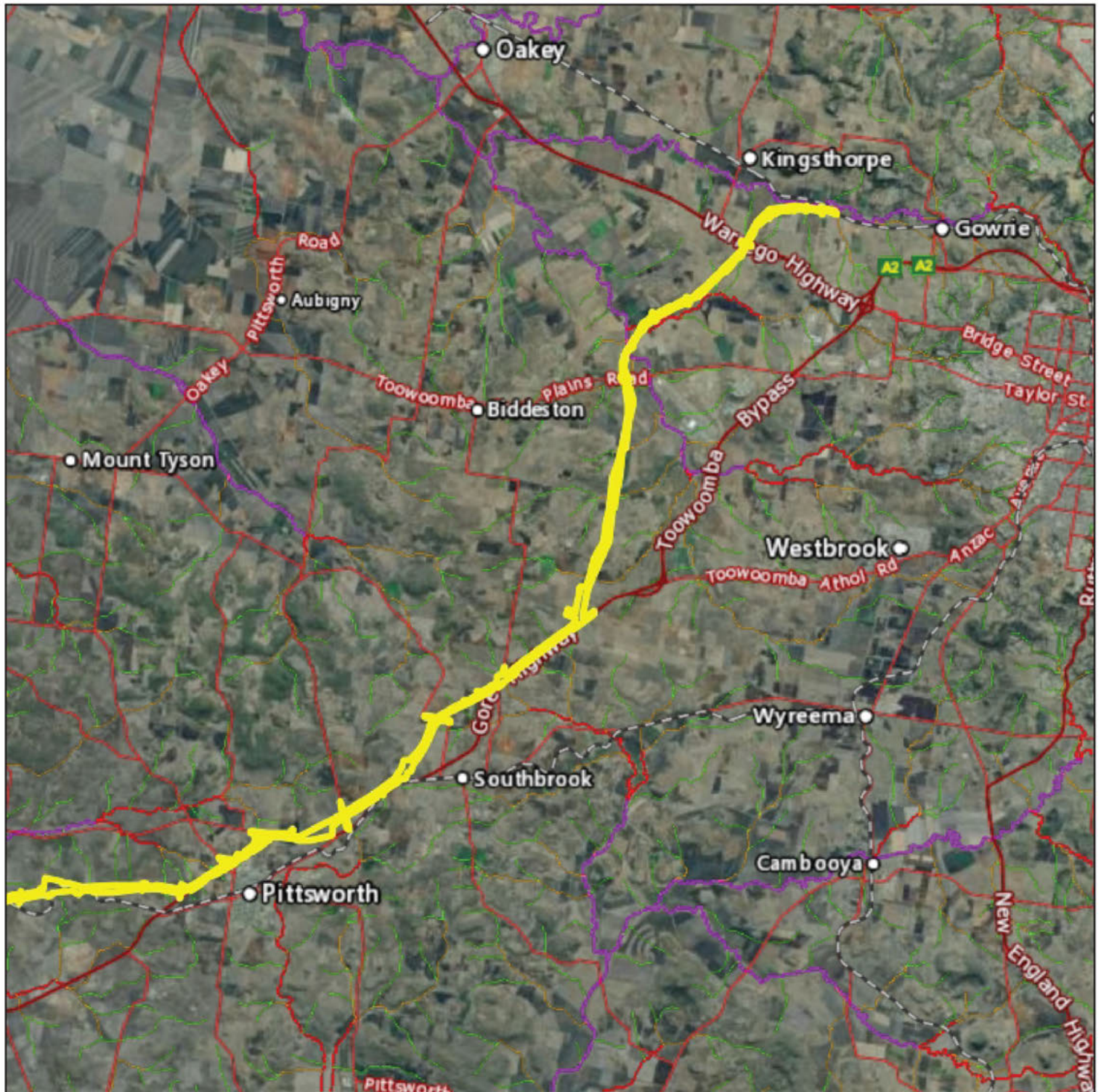
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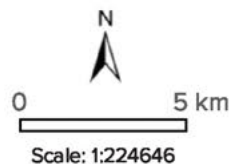


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## Climate statistics for Australian locations

### Monthly climate statistics

#### All years of record

##### Site information

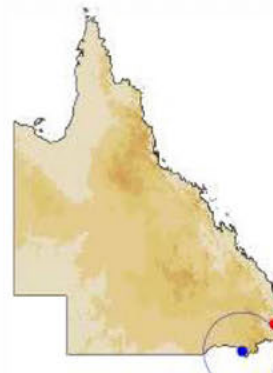
**Site name:** TEXAS POST OFFICE  
**Site number:** 041100  
**Latitude:** 28.85 °S **Longitude:** 151.17 °E  
**Elevation:** 295 m  
**Commenced:** 1897 **Status:** Open  
**Latest available data:** 22 Apr 2020

##### Additional information

[Additional site information](#)

##### Nearest alternative sites

- 041341 INGLEWOOD TOBACCO RES (45.3km)
- 041097 INGLEWOOD FOREST (57.9km)
- 054104 PINDARI DAM (59.7km)



  **View:** ☒ Main statistics ☐ All available  **Period:** Use all years of data   **Text size:** ☒ Normal ☐ Large

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years
<b>Temperature</b>														
Mean maximum temperature (°C)	33.9	32.7	31.2	27.5	23.0	19.4	18.9	20.9	24.6	28.0	30.6	32.9	27.0	50 1969 2020
Mean minimum temperature (°C)	18.8	18.4	16.1	11.9	8.0	4.7	3.7	4.5	7.9	11.8	15.0	17.4	11.5	50 1969 2020
<b>Rainfall</b>														
Mean rainfall (mm)	88.6	75.5	56.6	34.1	38.9	40.6	41.0	33.6	39.5	60.6	66.9	80.2	65.4	129 1881 2020
Decile 5 (median) rainfall (mm)	71.7	62.1	42.7	25.2	30.2	31.1	33.3	27.4	34.0	48.6	59.6	75.9	66.2	123 1881 2020
Mean number of days of rain ≥ 1 mm	5.6	4.9	4.1	2.6	3.2	4.0	4.1	3.7	3.8	5.0	5.4	6.1	52.5	123 1897 2020
<b>Other daily elements</b>														
Mean daily sunshine (hours)														
Mean number of clear days	7.8	6.6	10.9	11.6	11.0	11.4	13.5	13.6	13.2	11.4	8.5	8.6	128.1	35 1969 2010
Mean number of cloudy days	6.9	7.1	4.6	3.7	5.2	5.6	6.1	5.1	4.7	6.0	7.0	6.3	68.3	35 1969 2010
<b>9 am conditions</b>														
Mean 9am temperature (°C)	26.0	25.1	23.3	19.3	14.4	10.2	9.5	11.9	16.6	20.7	23.1	25.3	18.8	40 1969 2010
Mean 9am relative humidity (%)	57	61	60	64	72	79	78	66	59	54	55	55	63	23 1986 2010
Mean 9am wind speed (km/h)	9.0	9.0	8.7	8.6	8.5	8.5	8.7	8.9	9.2	10.2	9.7	9.7	9.1	33 1969 2010
<b>3 pm conditions</b>														
Mean 3pm temperature (°C)	31.9	30.9	29.8	26.2	21.7	18.1	17.7	19.8	23.3	26.2	28.7	31.1	25.5	35 1969 2010
Mean 3pm relative humidity (%)	39	42	36	36	42	47	44	35	34	34	37	36	38	19 1986 2010
Mean 3pm wind speed (km/h)	11.9	11.1	11.2	10.9	11.4	11.4	11.4	13.7	13.8	13.1	12.4	12.4	12.1	28 1969 2010

red = highest value blue = lowest value

Product IDCJCM0027 Prepared at Thu 23 Apr 2020 01:37:30 AM EST

Monthly statistics are only included if there are more than 10 years of data. The number of years (provided in the 2nd last column of the table) may differ between elements if the observing program at the site changed. More detailed data for individual sites can be obtained by contacting the Bureau.

#### Related Links

- This page URL: [http://www.bom.gov.au/climate/averages/tables/cw\\_041100.shtml](http://www.bom.gov.au/climate/averages/tables/cw_041100.shtml)
- About climate averages: <http://www.bom.gov.au/climate/cdo/about/about-stats.shtml>
- Bureau of Meteorology website: <http://www.bom.gov.au>

Page created: Thu 23 Apr 2020 01:37:30 AM EST



# APPENDIX

# P

## Surface Water Quality Technical Report

### **Appendix E** Gauging Station Seasonality Plots

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

## Appendix E

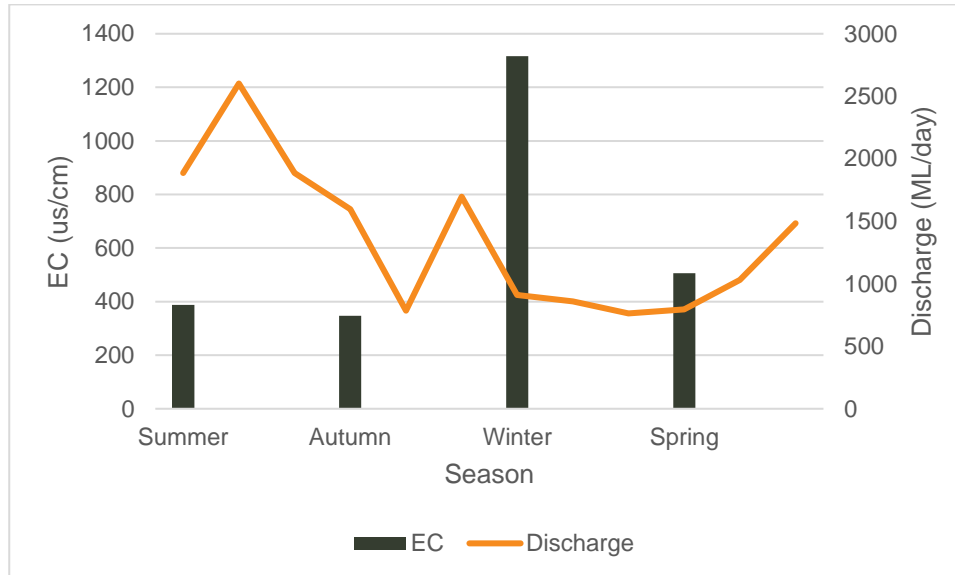
### Gauging station seasonality plots



## Appendix E

### Gauging station seasonality plots

#### Gowrie Creek at Oakey (422332B)

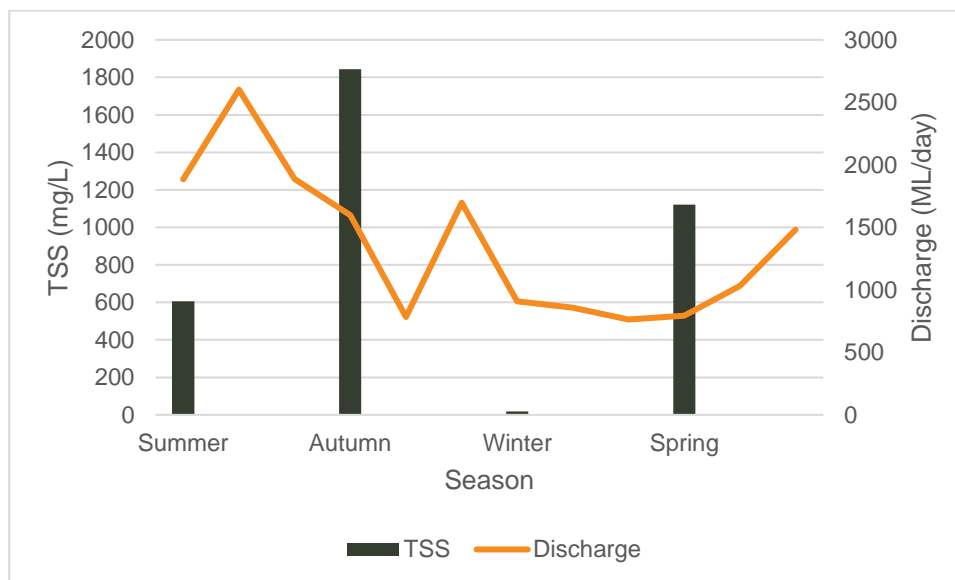


**Figure E-1** Electrical conductivity ( $\mu\text{S}/\text{cm}$ ) seasonality data (median) relative to seasonal discharge

**Figure note:**

Data available from period of 1992 – 2018

Summer (n=63), autumn (n=40), winter (n=20), spring (n=53)

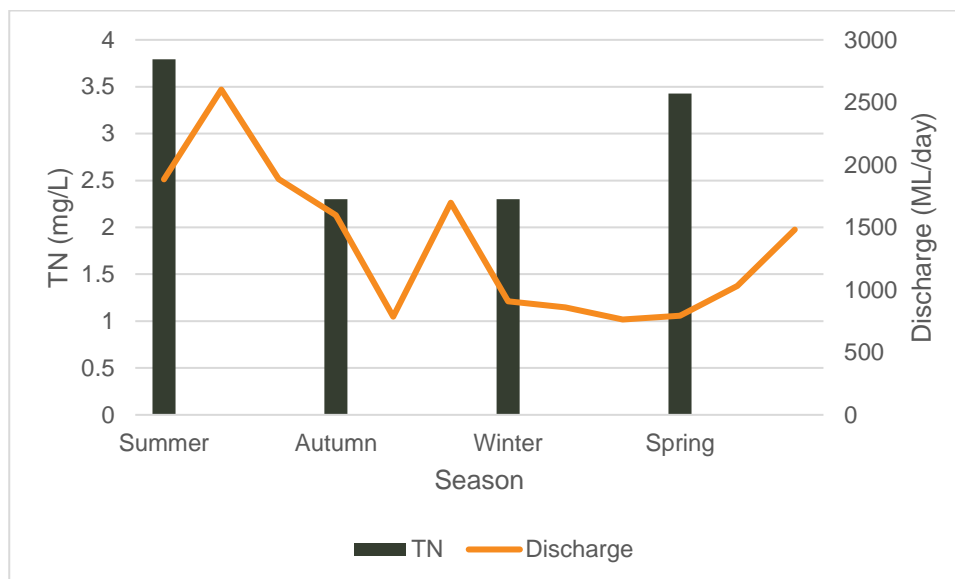


**Figure E-2** Total suspended solids (mg/L) seasonality data (median) relative to seasonal discharge

**Figure note:**

Data available from period of 1992 – 2018

Summer (n=63), autumn (n=40), winter (n=18), spring (n=50)

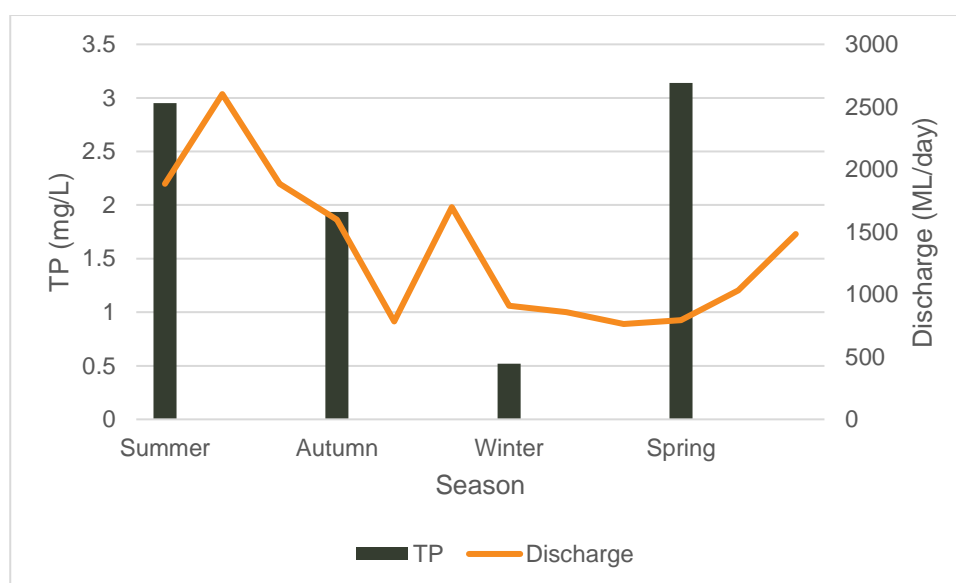


**Figure E-3 Total nitrogen (mg/L) seasonality data (median) relative to seasonal discharge**

**Figure note:**

Data available from period of 1992 – 2018

Summer (n=50), autumn (n=16), winter (n=12), spring (n=19)



**Figure E-4 Total phosphorus (mg/L) seasonality data (median) relative to seasonal discharge**

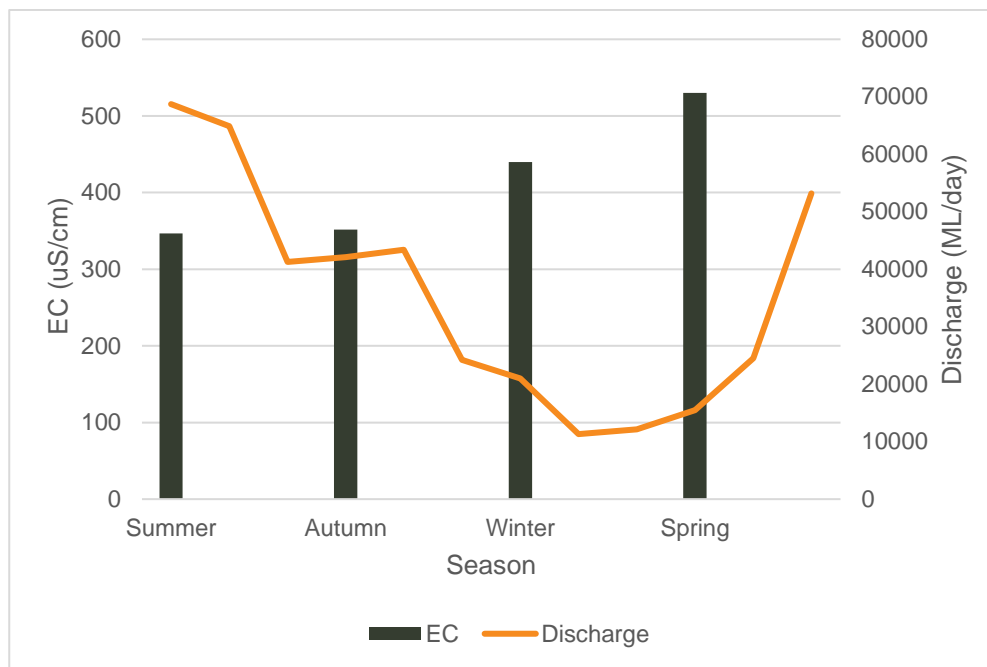
**Figure note:**

Data available from period of 1992 – 2018

Summer (n=62), autumn (n=26), winter (n=18), spring (n=47)



## Condamine River at Tummaville (422323A)

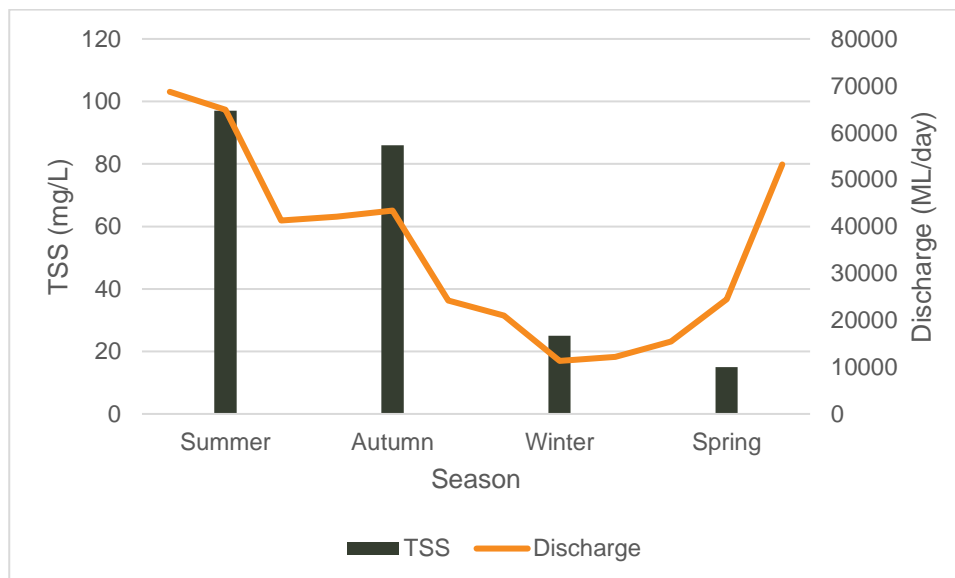


**Figure E-5 Electrical conductivity season data versus flow**

**Figure note:**

Data available from period of 1963 – 2017

Summer (n=32), Autumn (n=32), Winter (n=35) and Spring (n=27)

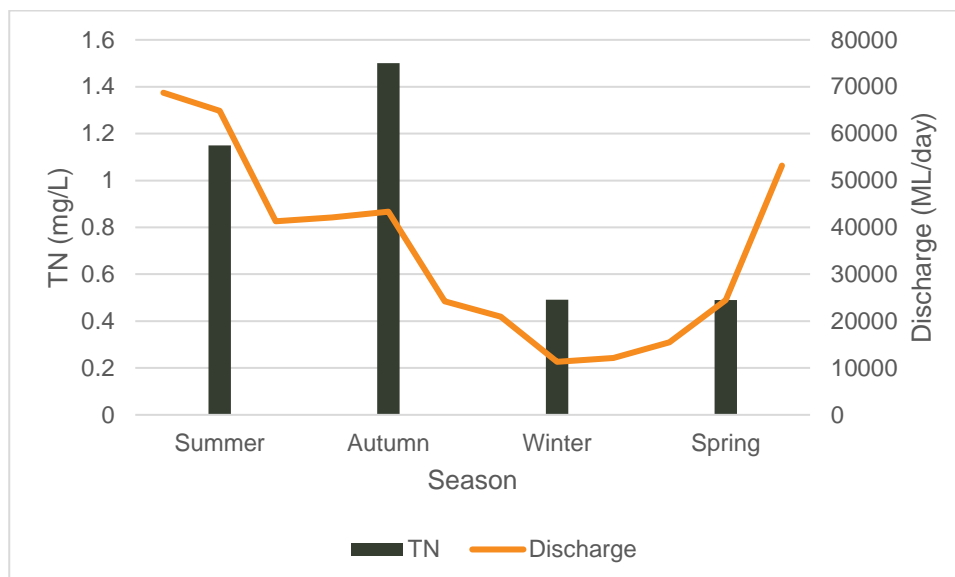


**Figure E-6 Total suspended solids season data versus flow**

**Figure note:**

Data available from period of 1963 – 2017

Summer (n=24), Autumn (n=24), Winter (n=27) and Spring (n=20)

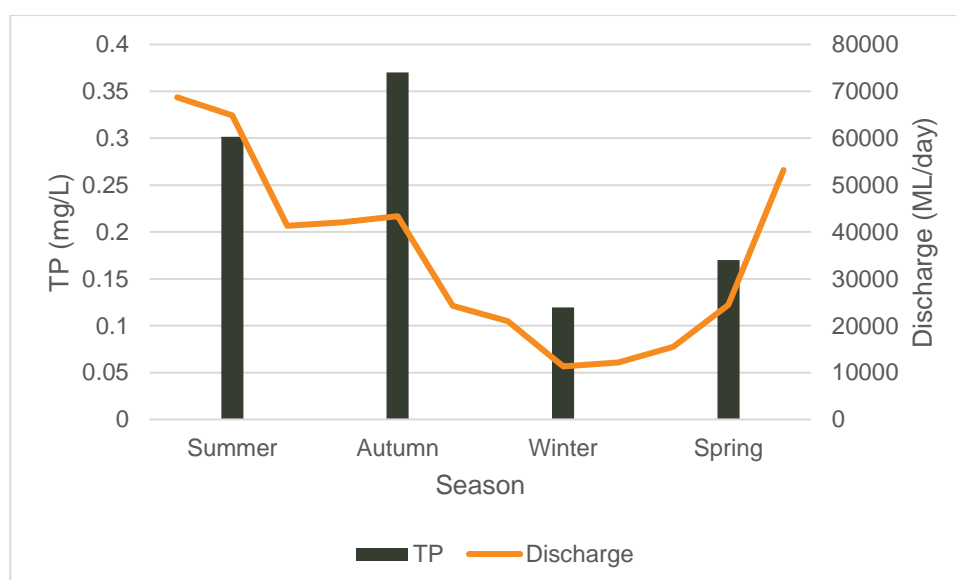


**Figure E-7 Total nitrogen season data versus flow**

**Figure note:**

Data available from period of 1963 – 2017

Summer (n=10), Autumn (n=10), Winter (n=7) and Spring (n=6)



**Figure E-8 Total phosphorus season data versus flow**

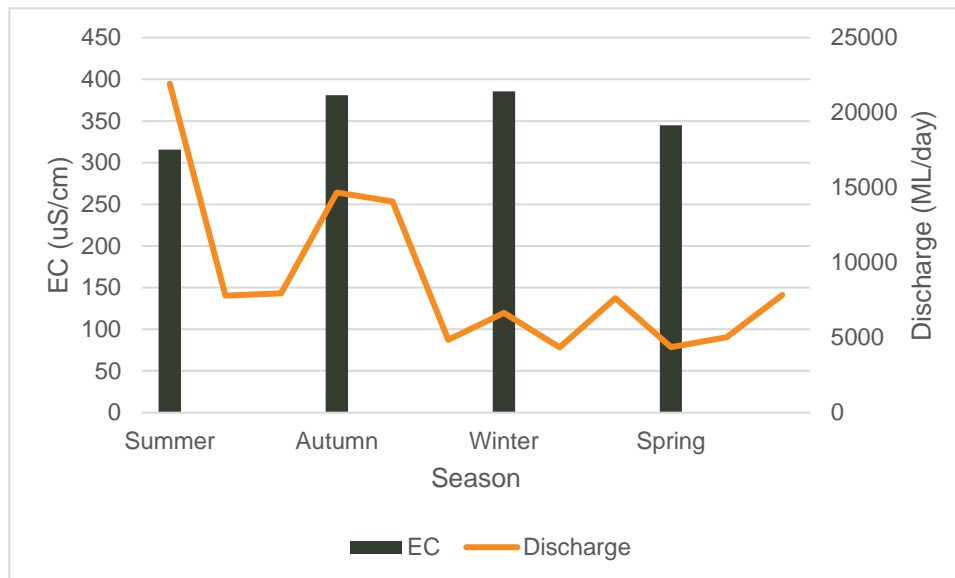
**Figure note:**

Data available from period of 1963 – 2017

Summer (n=13), Autumn (n=12), Winter (n=9) and Spring (n=8)



## Macintyre Brooke at Inglewood (416402C)

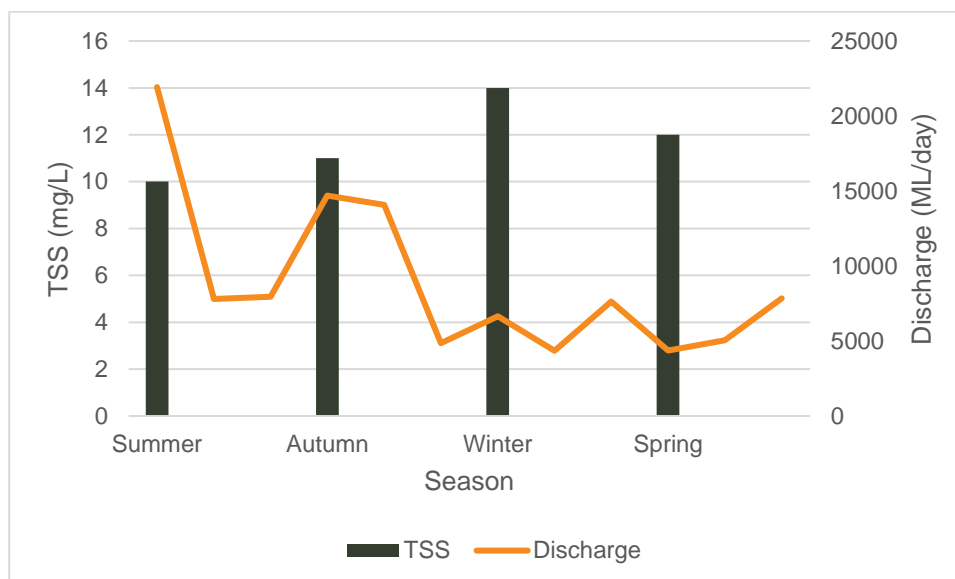


**Figure E-9** Electrical conductivity season data versus flow

**Figure note:**

Data available from period of 1981 – 2018

Summer (n=19), Autumn (n=19), Winter (n=16) and Spring (n=17)

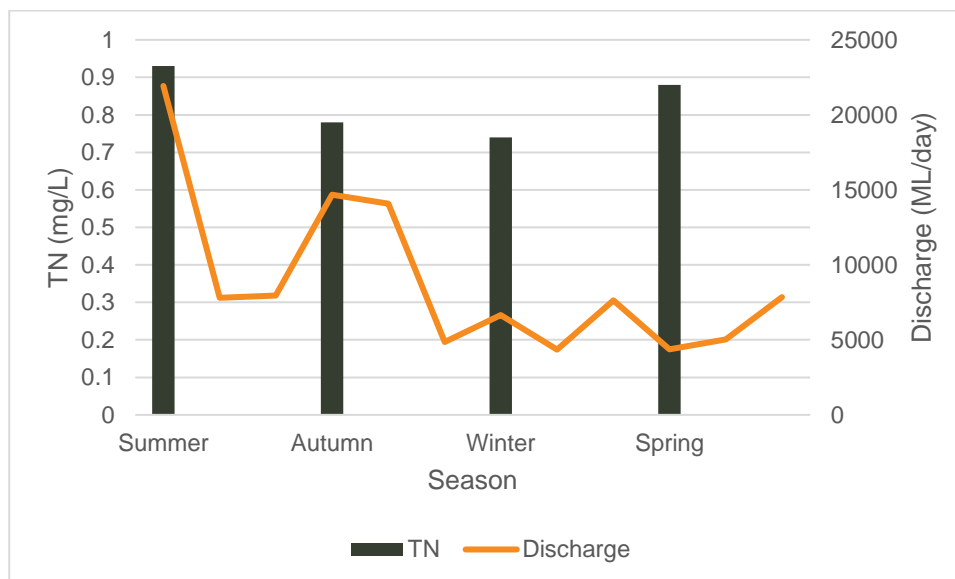


**Figure E-10** Total suspended sediments season data versus flow

**Figure note:**

Data available from period of 1981 – 2018

Summer (n=19), Autumn (n=17), Winter (n=12) and Spring (n=15)

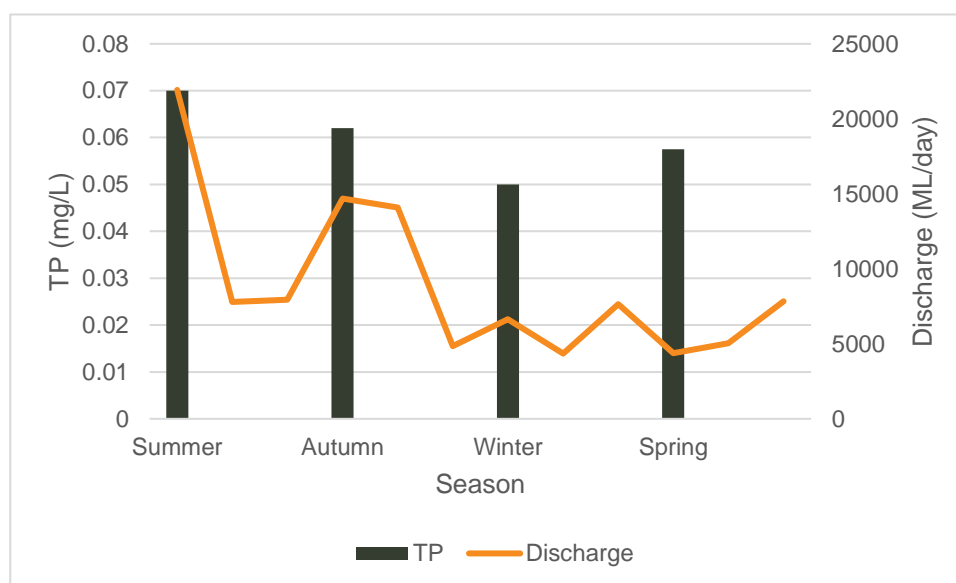


**Figure E-11 Total nitrogen season data versus flow**

**Figure note:**

Data available from period of 1981 – 2018

Summer (n=9), Autumn (n=9), Winter (n=5) and Spring (n=5)



**Figure E-12 Total phosphorus season data versus flow**

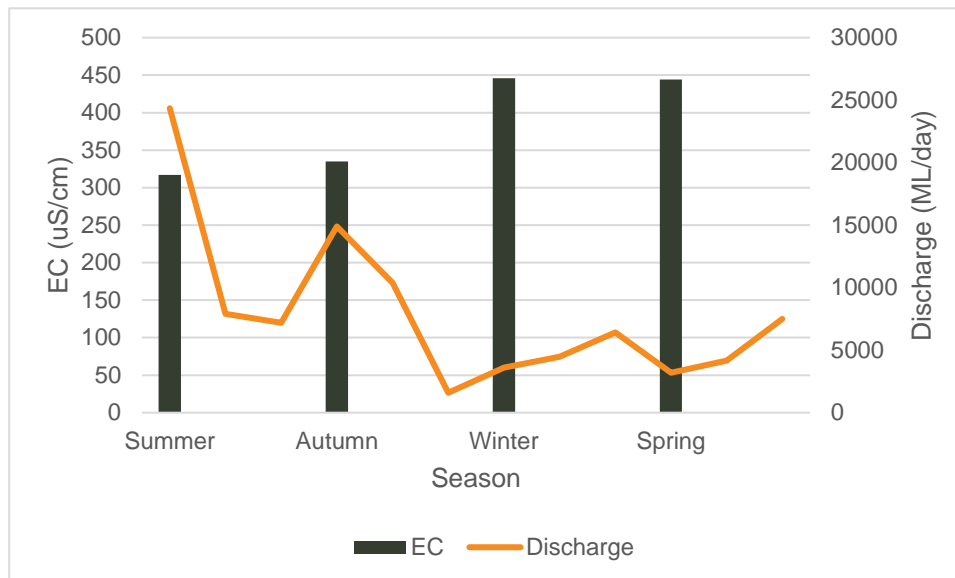
**Figure note:**

Data available from period of 1981 – 2018

Summer (n=10), Autumn (n=9), Winter (n=5) and Spring (n=5)



## Macintyre Brook at Booba Sands (416415A)

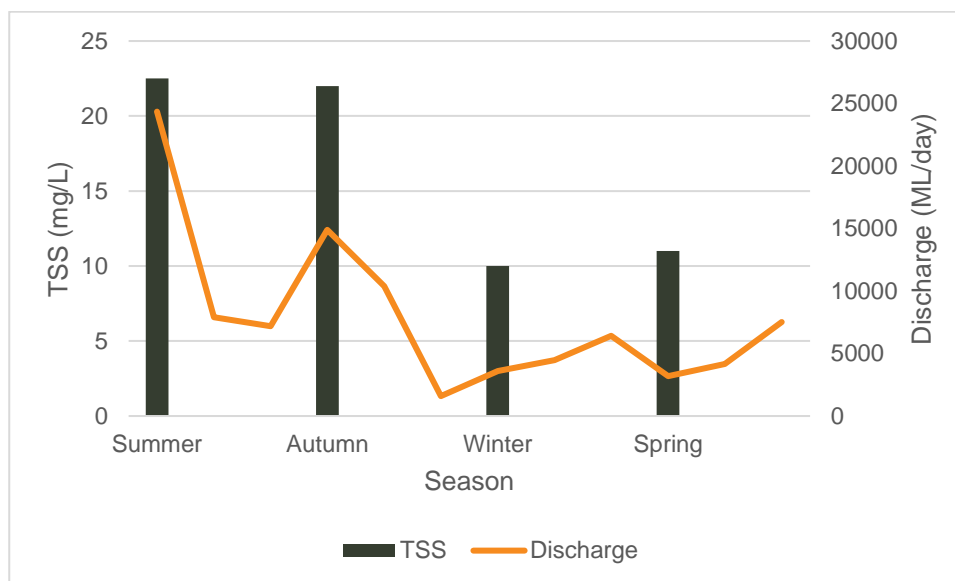


**Figure E-13 Electrical conductivity season data versus flow**

**Figure note:**

Data available from period of 1986 – 2019

Summer (n=23), Autumn (n=16), Winter (n=15) and Spring (n=12)

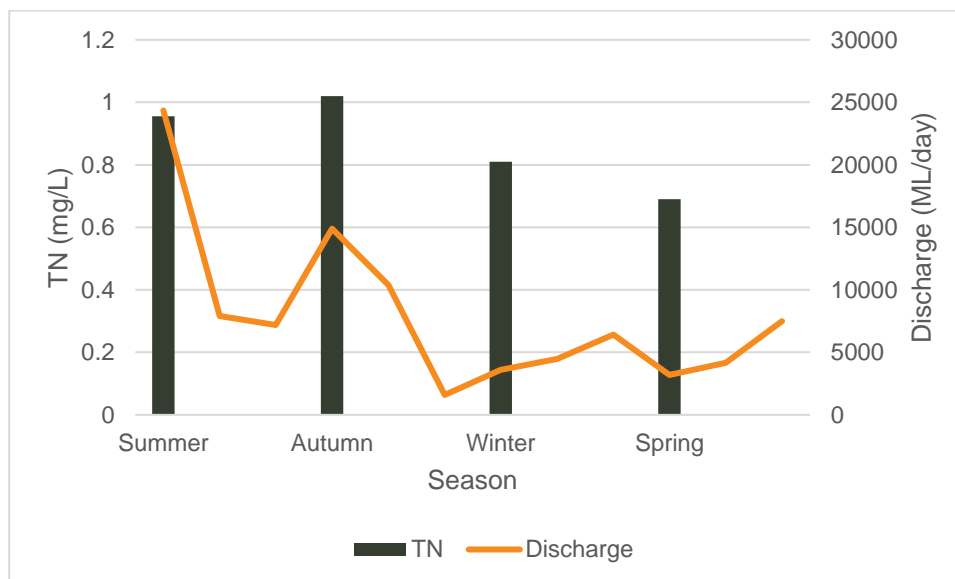


**Figure E-14 Total suspended solids season data versus flow**

**Figure note:**

Data available from period of 1986 – 2019

Summer (n=21), Autumn (n=13), Winter (n=12) and Spring (n=11)

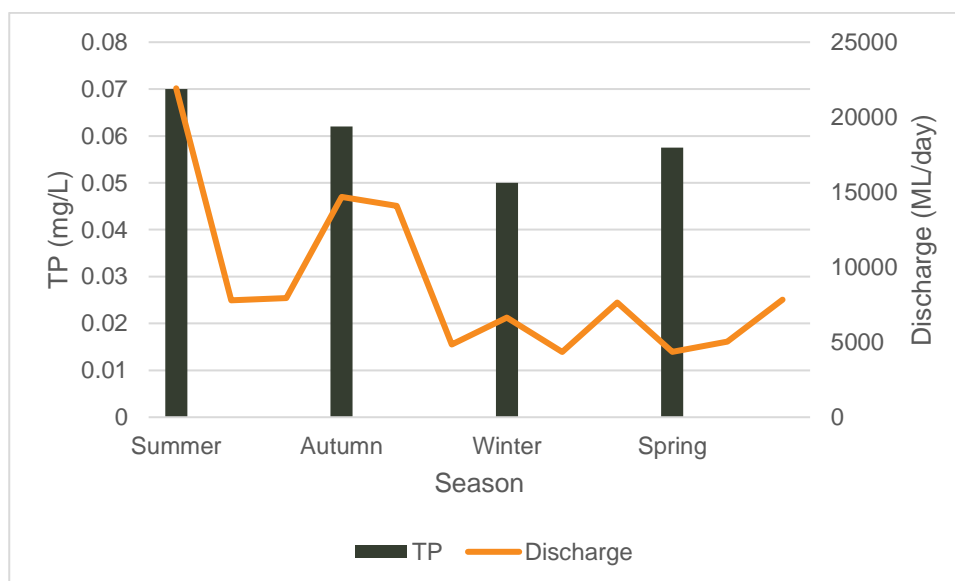


**Figure E-15 Total nitrogen season data versus flow**

**Figure note:**

Data available from period of 1986 – 2019

Summer (n=13), Autumn (n=9), Winter (n=9) and Spring (n=6)



**Figure E-16 Total phosphorus season data versus flow**

**Figure note:**

Data available from period of 1986 – 2019

Summer (n=13), Autumn (n=9), Winter (n=9) and Spring (n=6)



# APPENDIX

# P

## Surface Water Quality Technical Report

### **Appendix F** Artificial Waterbodies Within Impact Assessment Area

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

## Appendix F

### Artificial waterbodies within impact assessment area



Map by: RBMEF/DTH Z:\GIS\GIS\_310\_B2G\Tasks\310-EAP-2019\101214\_FFIV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- Existing rail
- NSW/QLD border to Gowrie alignment
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



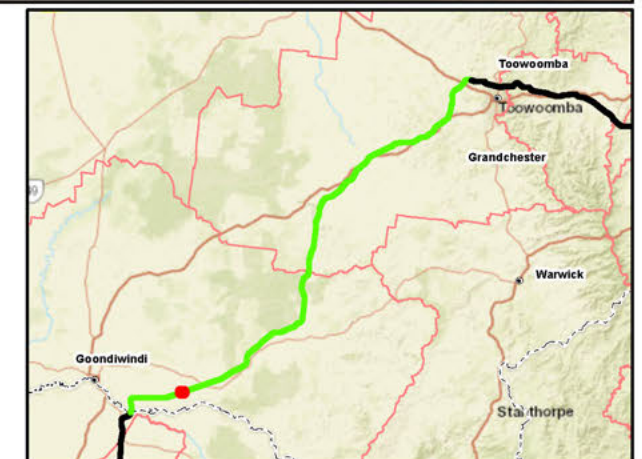
Map by: RBMEF/DTH Z:\GIS\GIS\_310\_B2G\Tasks\310-EAP-2019\0101214\_SurfaceWaterQuality\310-EAP-2019\0101214\_FF\JV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- Existing rail
- NSW/QLD border to Gowrie alignment
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



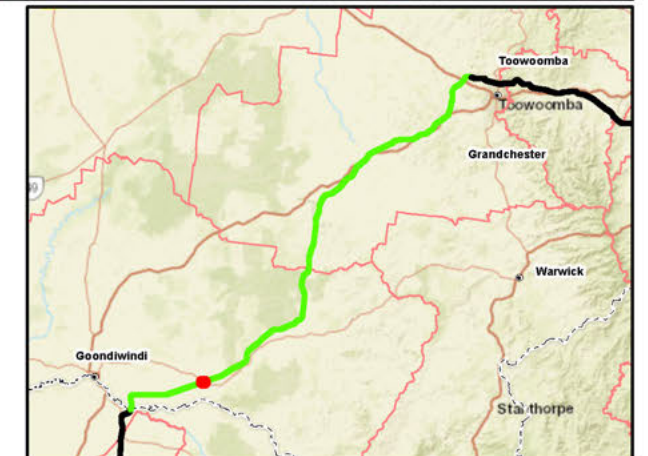
Map by: RE/MEF/DTM 2:GIS/GIS\_310\_B2GIS/GIS\_310-EAP-201910101214\_SurfaceWaterQuality310-EAP-201910101214\_FFIV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- Localities
- Existing rail
- NSW/QLD border to Gowrie alignment
- Major roads
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



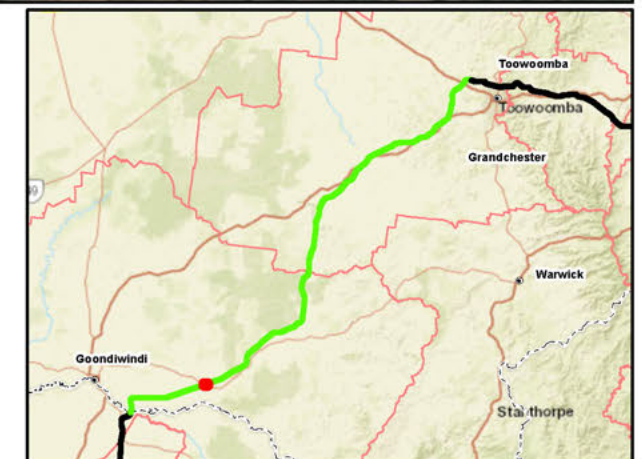
Map by: RE/MEF/DTM 2:GIS/GIS\_310\_B2GIS/GIS\_310-EAP-201910101214\_SurfaceWaterQuality310-EAP-201910101214\_FFIV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- Existing rail
- NSW/QLD border to Gowrie alignment
- Major roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km

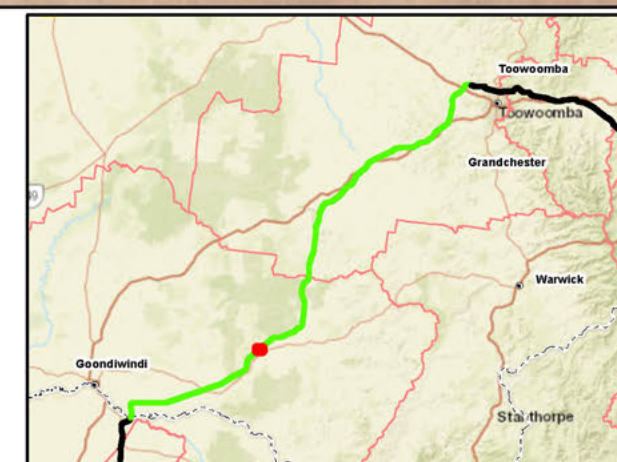




# Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:5,000  
 0 0.035 0.07 0.105 0.14 0.175km



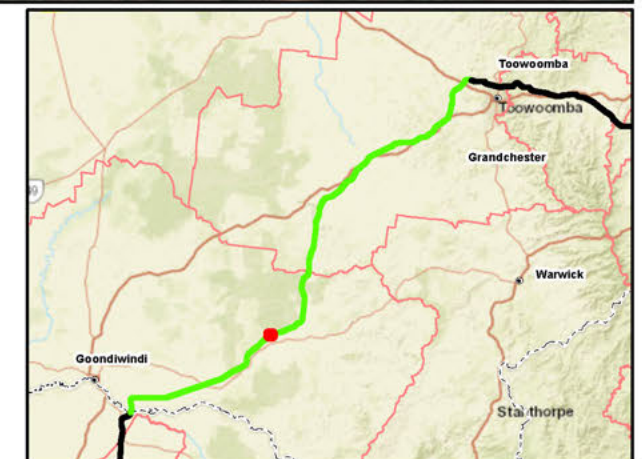
Map by: RBMEF/DTM Z:\GIS\GIS\_310\_B2G\Tasks\310-EAP-2019\0101214\_SurfaceWaterQuality\310-EAP-2019\0101214\_FF\IV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- - - Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

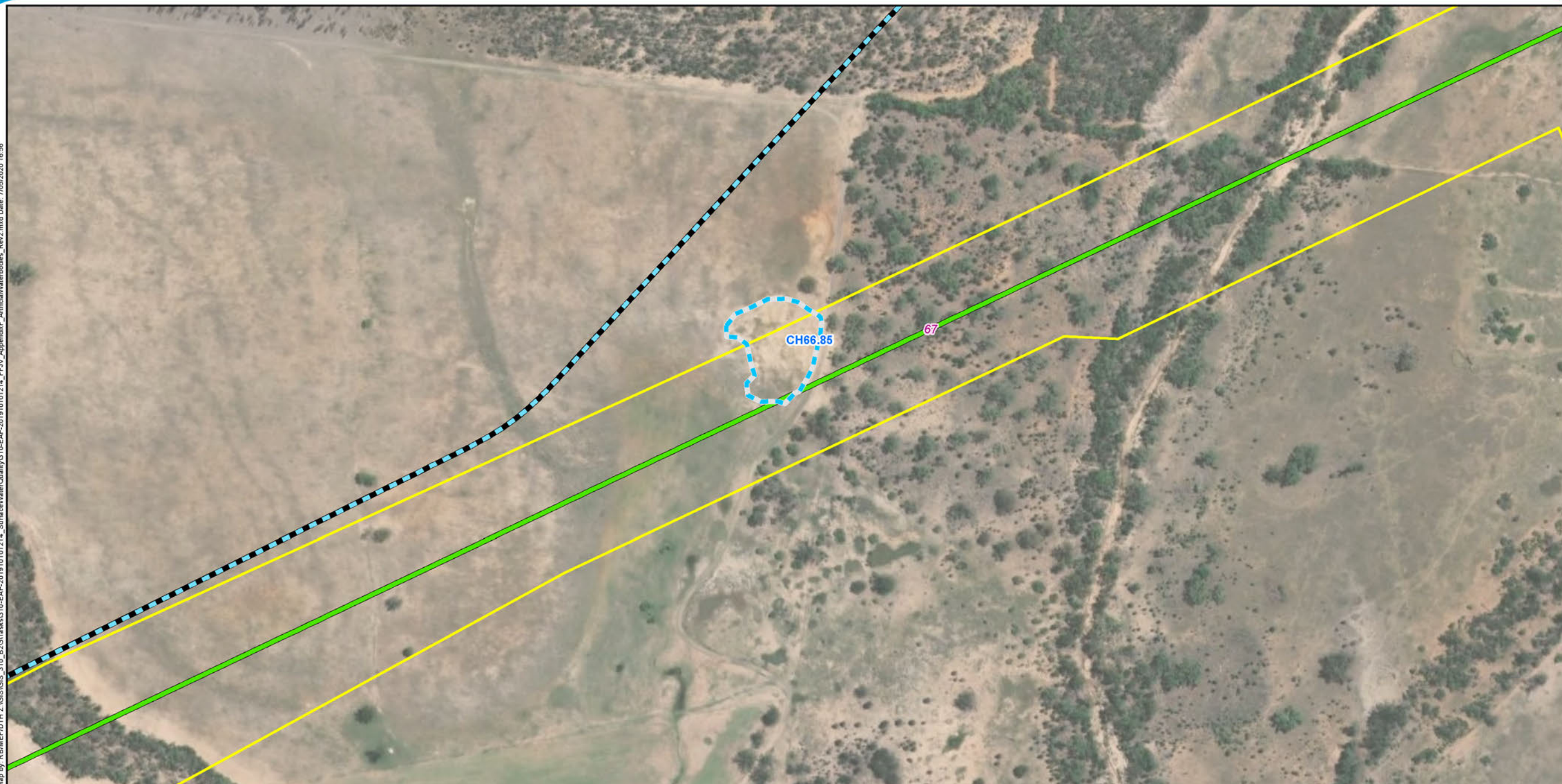
NSW/QLD border to Gowrie

Appendix F(f):

Artificial waterbodies which intersect with the Project disturbance area



Map by: RBMEF/DTM 2:GIS/GIS\_310\_B2G/Tasks/310-EAP-2019/0101214\_SurfaceWaterQuality/310-EAP-2019/0101214\_FFIV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- - - Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



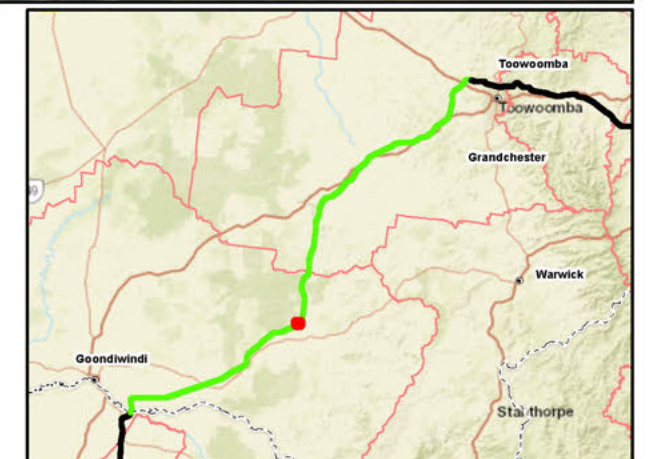
Map by: RBMEF/DTM Z:\GIS\GIS\_310\_B2G\Tasks\310-EAP-2019\0101214\_SurfaceWaterQuality\310-EAP-2019\0101214\_FFIV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

*Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.*



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

**NSW/QLD border to Gowrie**

**Appendix F(h):**

**Artificial waterbodies which intersect with the Project disturbance area**



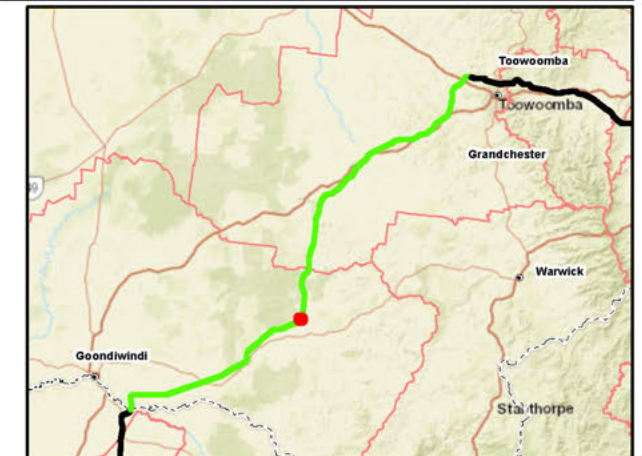
Map by: RBMEF/DTM Z:\GIS\GIS\_310\_B2G\Tasks\310-EAP-2019\101214\_SurfaceWaterQuality\310-EAP-2019\101214\_FF\IV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

*Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.*

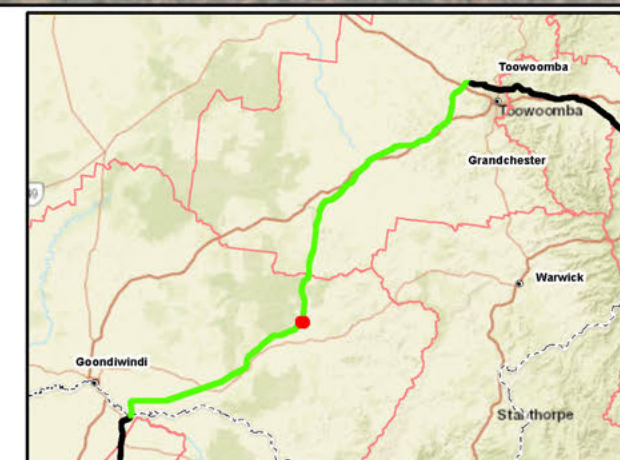


A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km





- Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.*



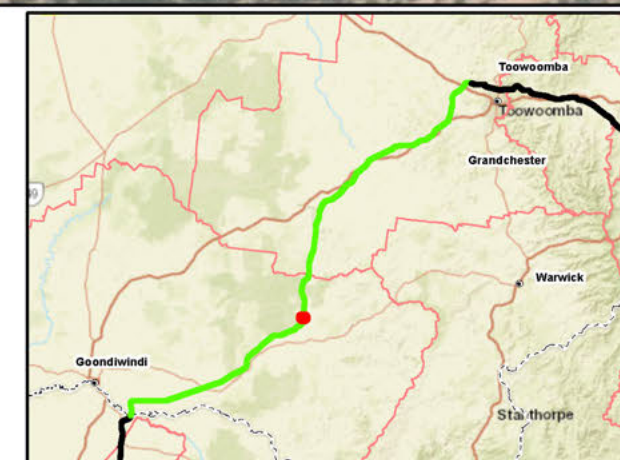
### Appendix F(j):

### Artificial waterbodies which intersect with the Project disturbance area

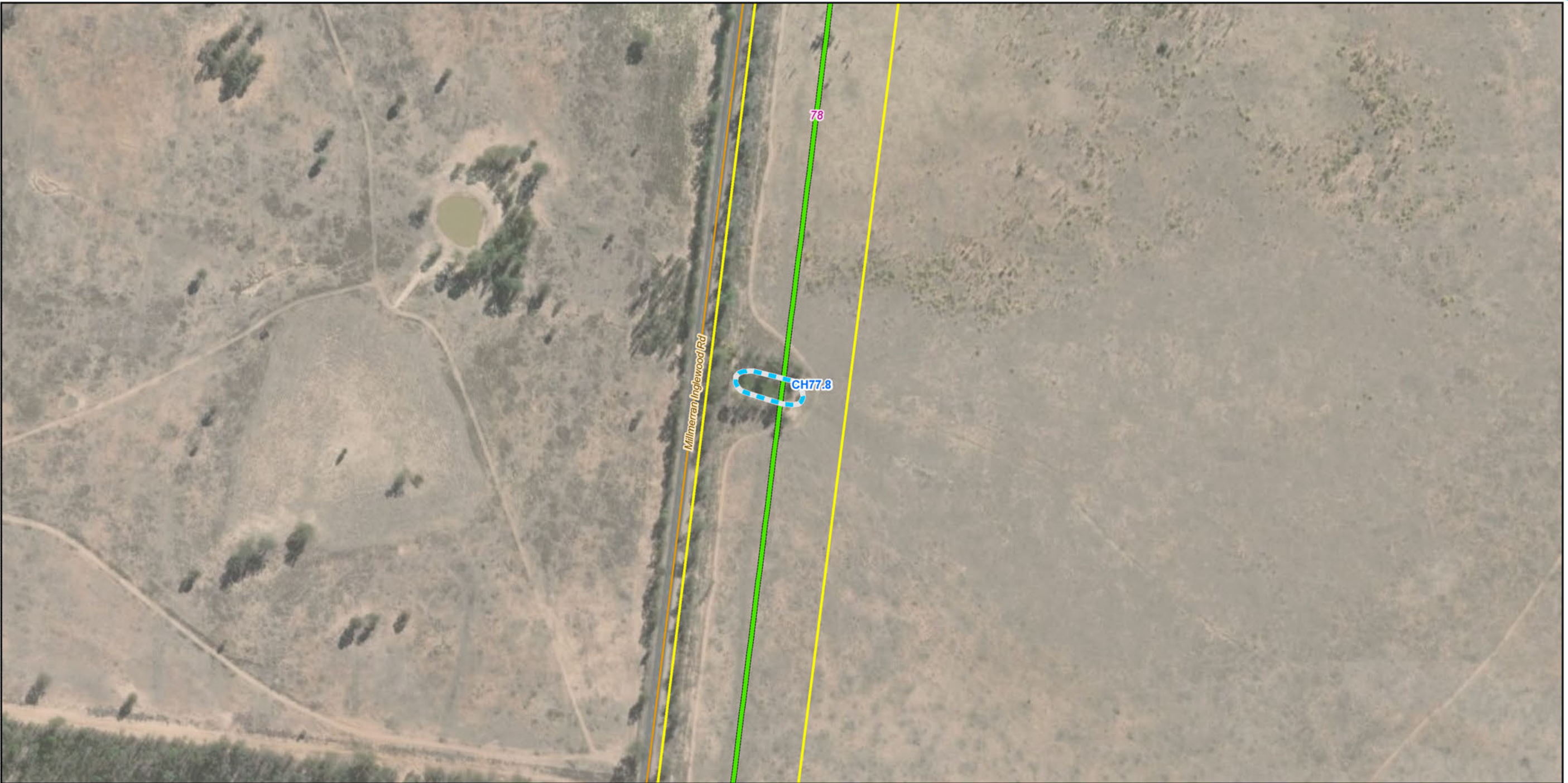




- Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.*



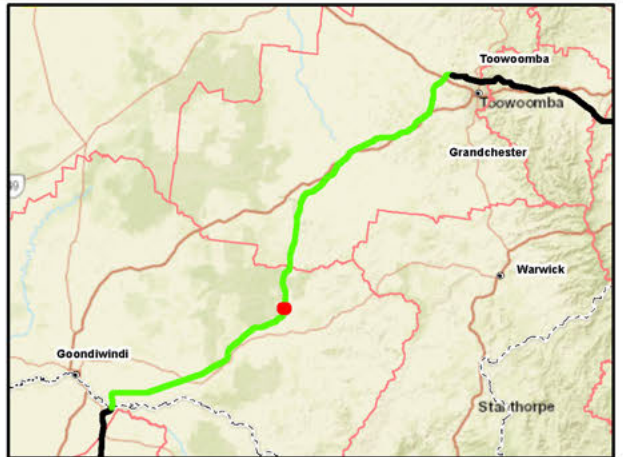




**Legend**

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

**NSW/QLD border to Gowrie**

**Appendix F(I):**

**Artificial waterbodies which intersect with the Project disturbance area**



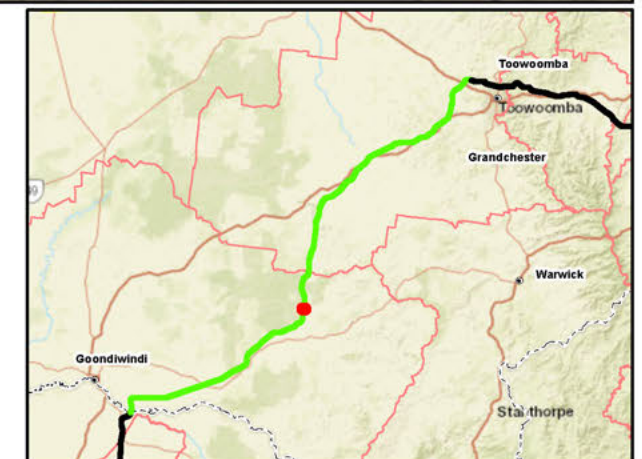
Map by: RBMEF/DTM 2:GIS/GIS\_310\_B2G/Tasks/310-EAP-2019/01/01/214\_SurfaceWaterQuality/310-EAP-2019/01/01/214\_FFIV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



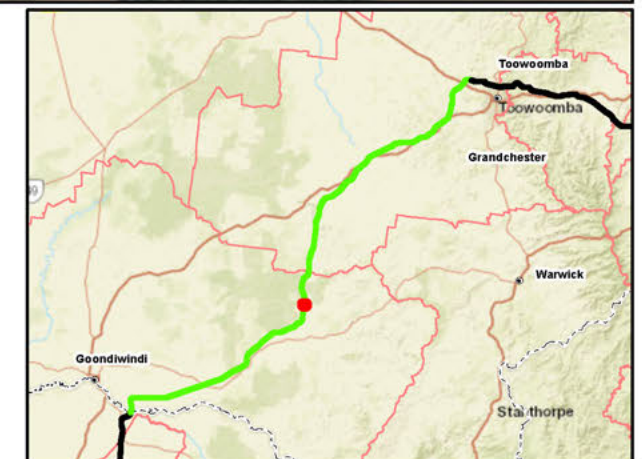
Map by: RB/MEF/DTH 2:\GIS\GIS\_310\_B2G\Tasks\310-EAP-2019\0101214\_SurfaceWaterQuality\310-EAP-2019\0101214\_FF\IV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

*Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.*



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



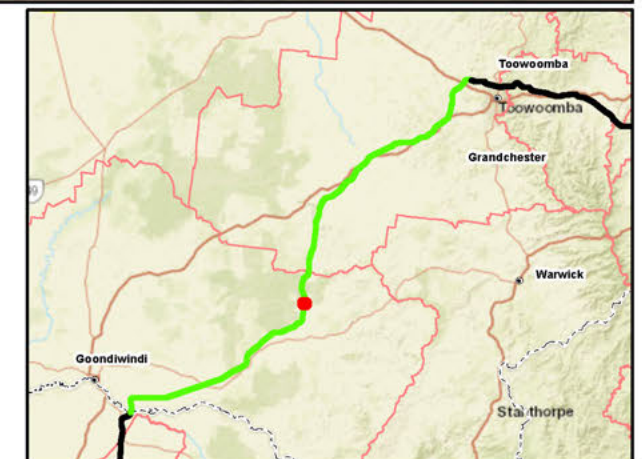
Map by: RB/MEF/DTH 2:\GIS\GIS\_310\_B2G\Tasks\310-EAP-2019\0101214\_SurfaceWaterQuality\310-EAP-2019\0101214\_FF\IV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

NSW/QLD border to Gowrie

Appendix F(o):

Artificial waterbodies which intersect with the Project disturbance area



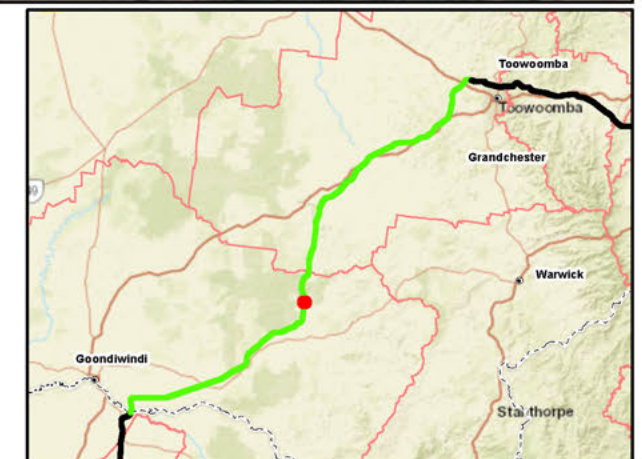
Map by: RB/MEF/DTH Z:\GIS\GIS\_310\_B2G\Tasks\310-EAP-2019\0101214\_SurfaceWaterQuality\310-EAP-2019\0101214\_FF\IV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



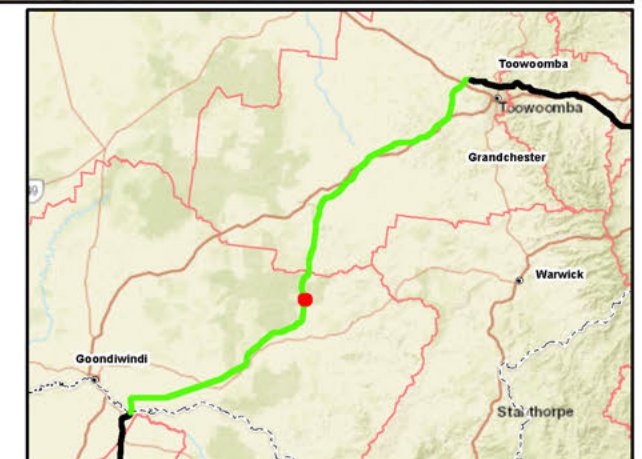
Map by: RB/MEF/DTH Z:\GIS\GIS\_310\_B2G\Tasks\310-EAP-2019\0101214\_SurfaceWaterQuality\310-EAP-2019\0101214\_FF\IV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

*Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.*



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

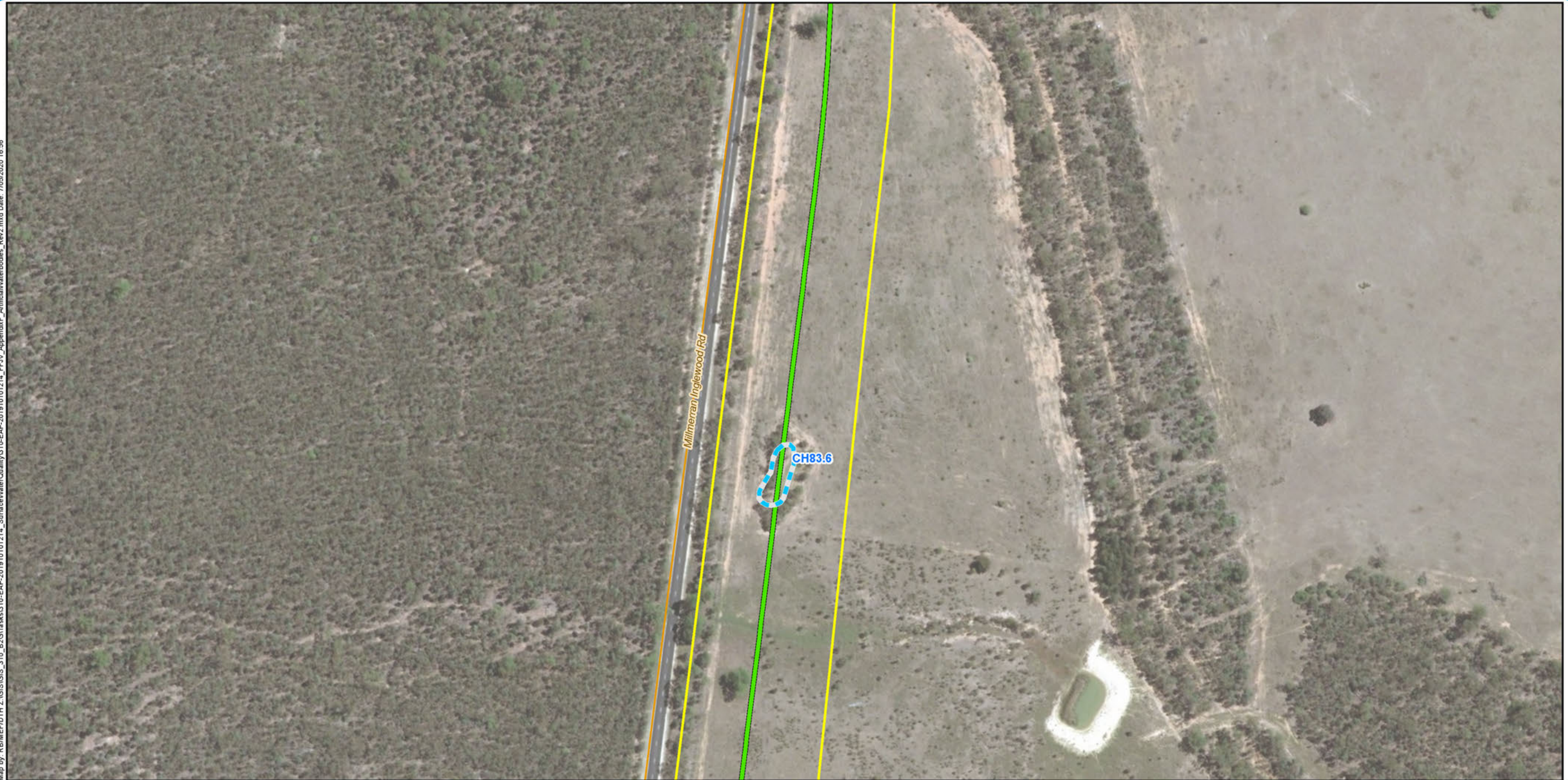
**NSW/QLD border to Gowrie**

**Appendix F(q):**

**Artificial waterbodies which intersect with the Project disturbance area**



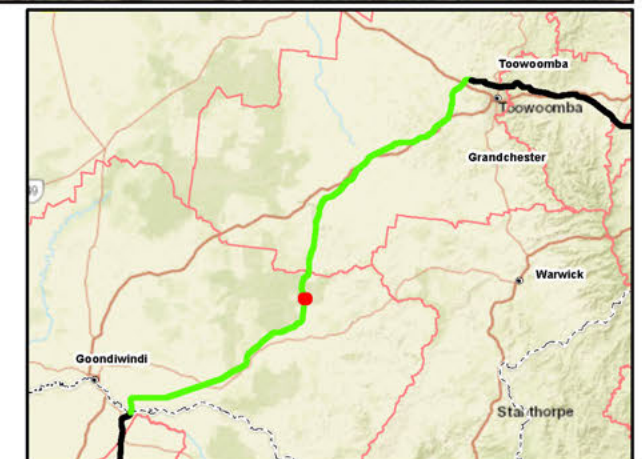
Map by: RB/MEF/DTH Z:\GIS\GIS\_310\_B2G\Tasks\310-EAP-2019\10101214\_SurfaceWaterQuality\310-EAP-2019\10101214\_FF\IV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,000  
 0 0.02 0.04 0.06 0.08 0.1km



Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

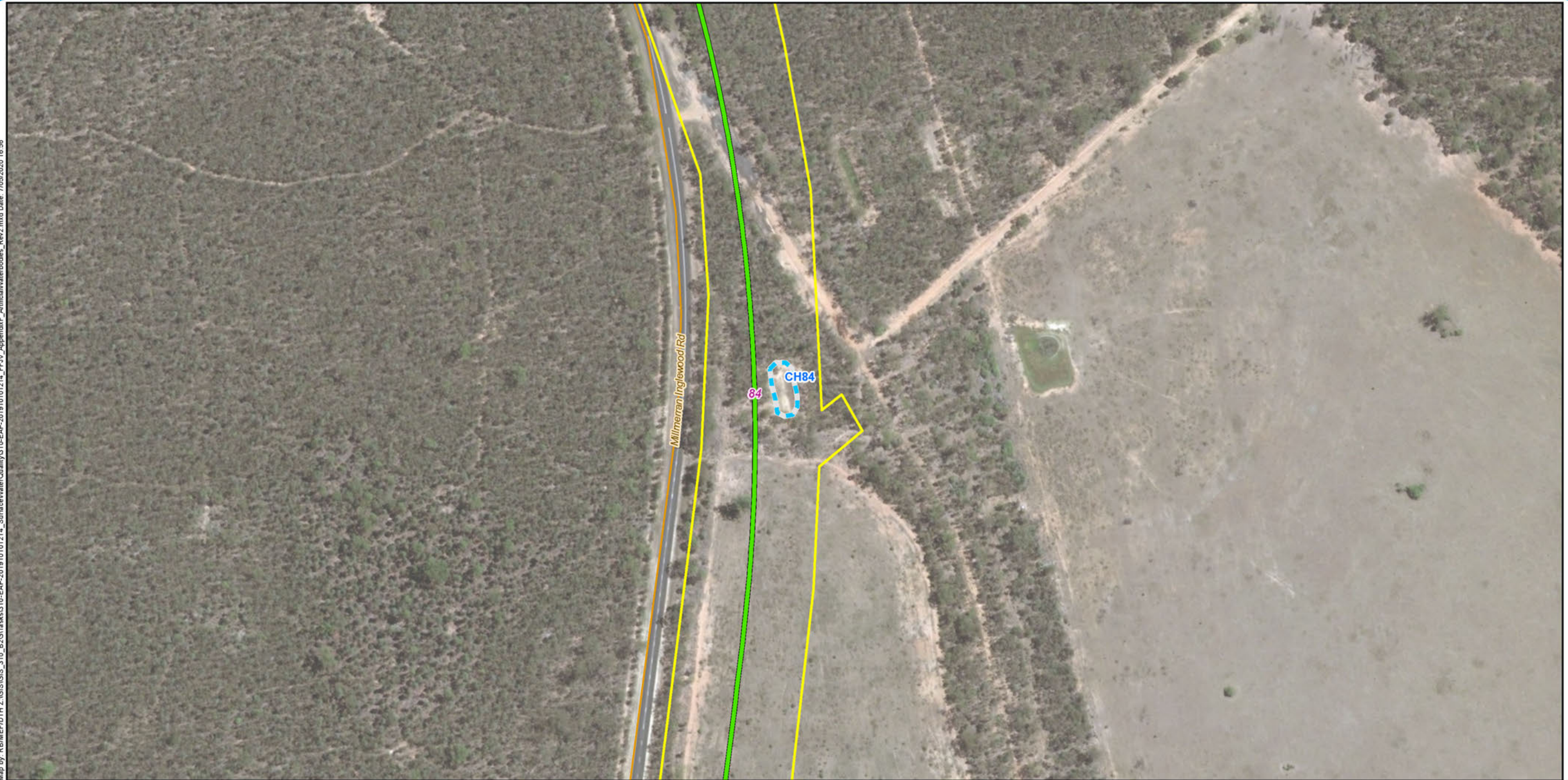
NSW/QLD border to Gowrie

Appendix F(r):

Artificial waterbodies which intersect with the Project disturbance area



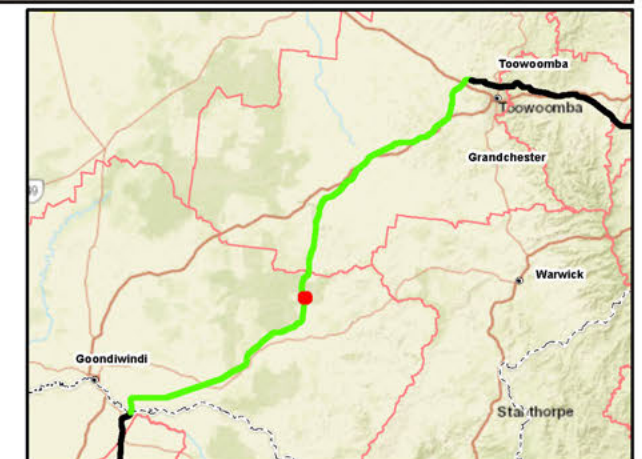
Map by: RB/MEF/DTH 2:\GIS\GIS\_310\_B2G\Tasks\310-EAP-2019\0101214\_SurfaceWaterQuality\310-EAP-2019\0101214\_FF\IV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,000  
 0 0.02 0.04 0.06 0.08 0.1km



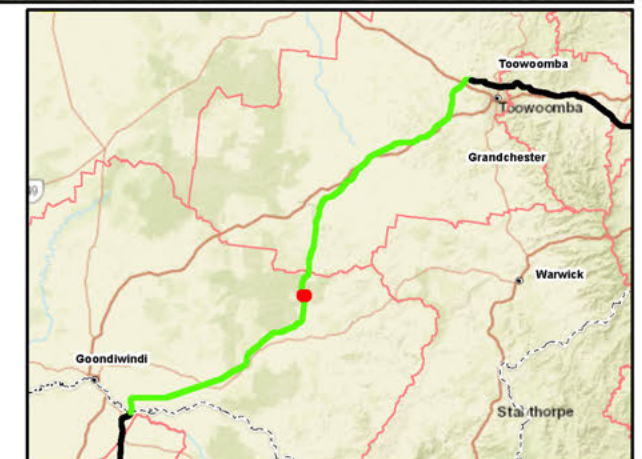
Map by: RB/MEF/DTM 2:GIS/GIS\_310\_B2GIS/GIS\_310-EAP-201910101214\_SurfaceWaterQuality310-EAP-201910101214\_FFIV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

NSW/QLD border to Gowrie

Appendix F(t):

Artificial waterbodies which intersect with the Project disturbance area





**Legend**

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



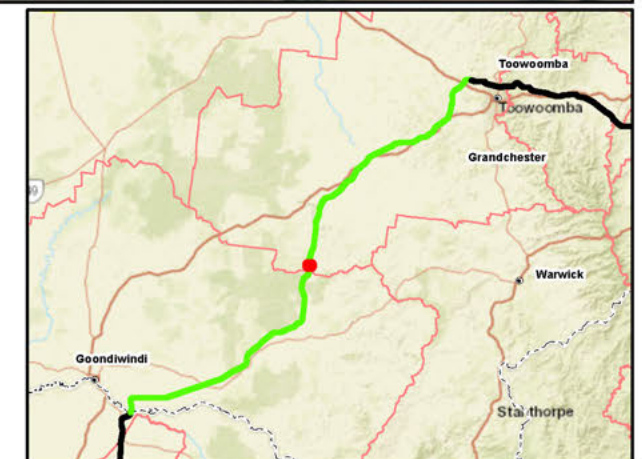
Map by: RB/MEF/DTH Z:\GIS\GIS\_310\_B2G\Tasks\310-EAP-2019\0101214\_SurfaceWaterQuality\310-EAP-2019\0101214\_FF\V\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

NSW/QLD border to Gowrie

Appendix F(v):

Artificial waterbodies which intersect with the Project disturbance area



Map by: RE/MEF/DTM 2:GIS/GIS\_310\_B2GIS/GIS\_310-EAP-201910101214\_SurfaceWaterQuality310-EAP-201910101214\_FFIV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



# Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



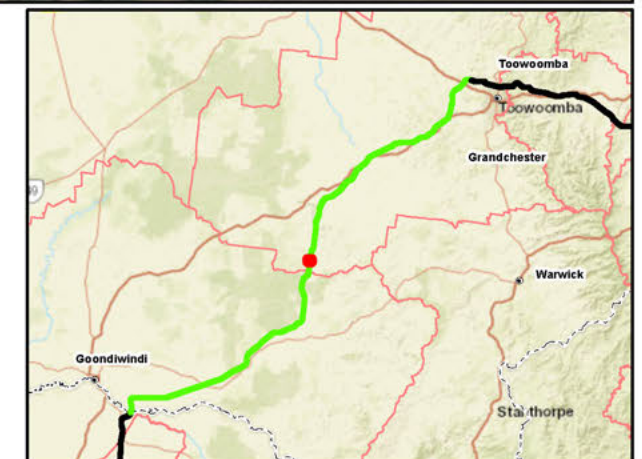
Map by: RB/MEF/DTM Z:\GIS\GIS\_310\_B2G\Tasks\310-EAP-2019\0101214\_SurfaceWaterQuality\310-EAP-2019\0101214\_FF\IV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

NSW/QLD border to Gowrie  
 Appendix F(x):

Artificial waterbodies which intersect with the Project disturbance area

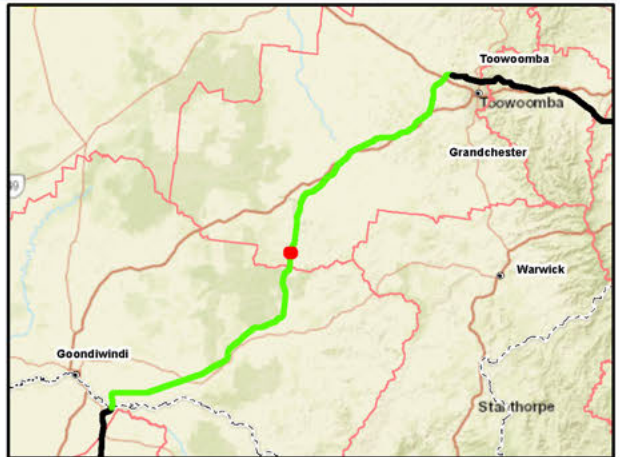




**Legend**

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km

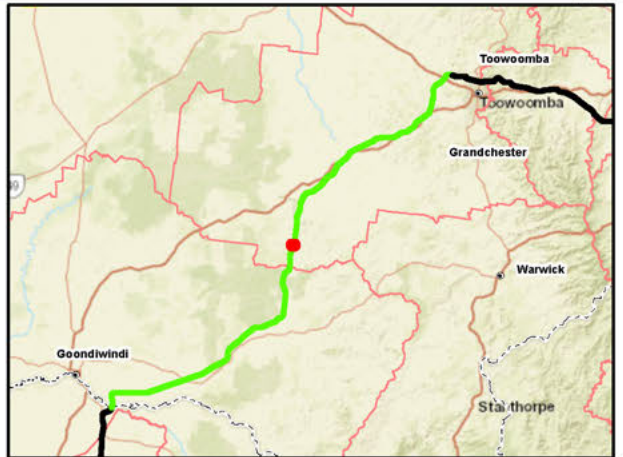




**Legend**

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
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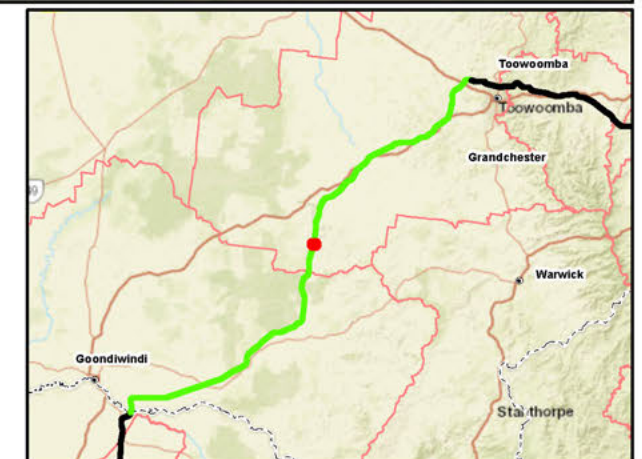
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#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- - - Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

**NSW/QLD border to Gowrie**  
**Appendix F(aa):**

**Artificial waterbodies which intersect with the Project disturbance area**



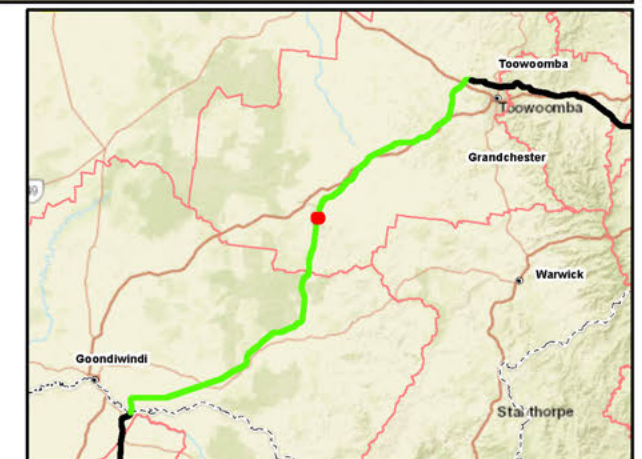
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#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

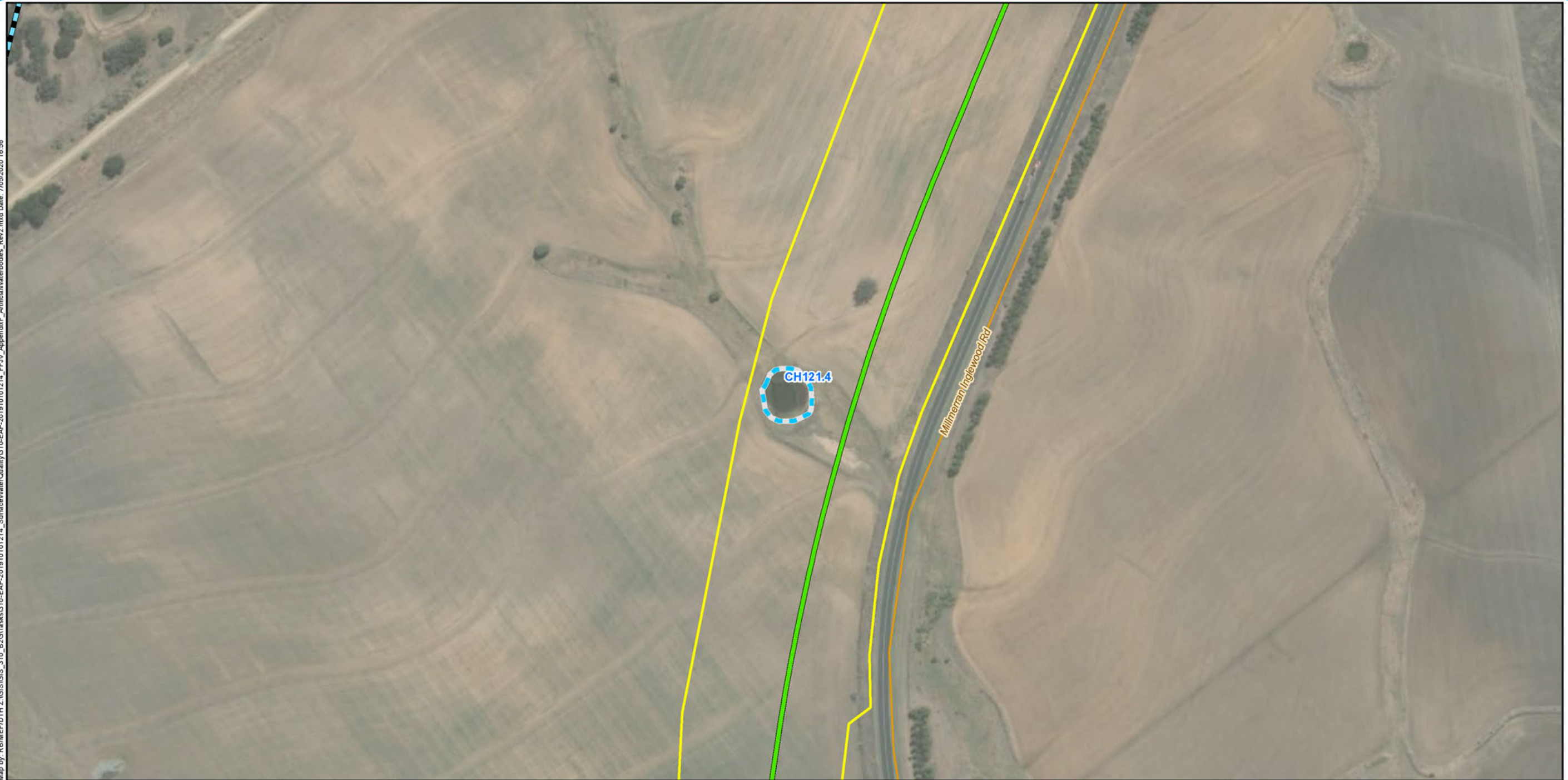
*Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.*



A3 scale: 1:3,500  
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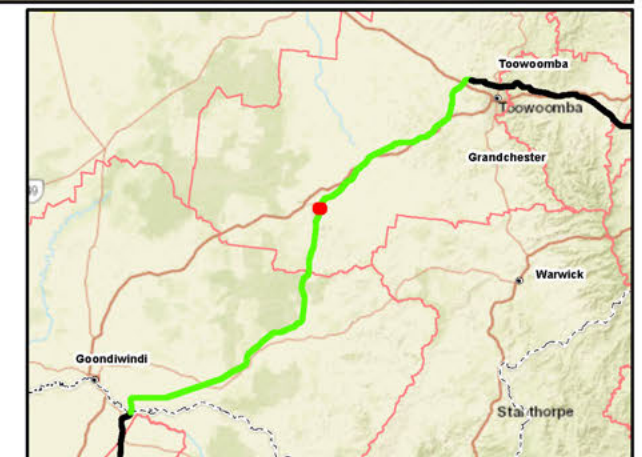
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#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

**NSW/QLD border to Gowrie**  
**Appendix F(ac):**

**Artificial waterbodies which intersect with the Project disturbance area**



Map by: RE/MEF/DTM 2:GIS/GIS\_310\_B2GIS/GIS\_310-EAP-201910101214\_SurfaceWaterQuality310-EAP-201910101214\_FFIV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

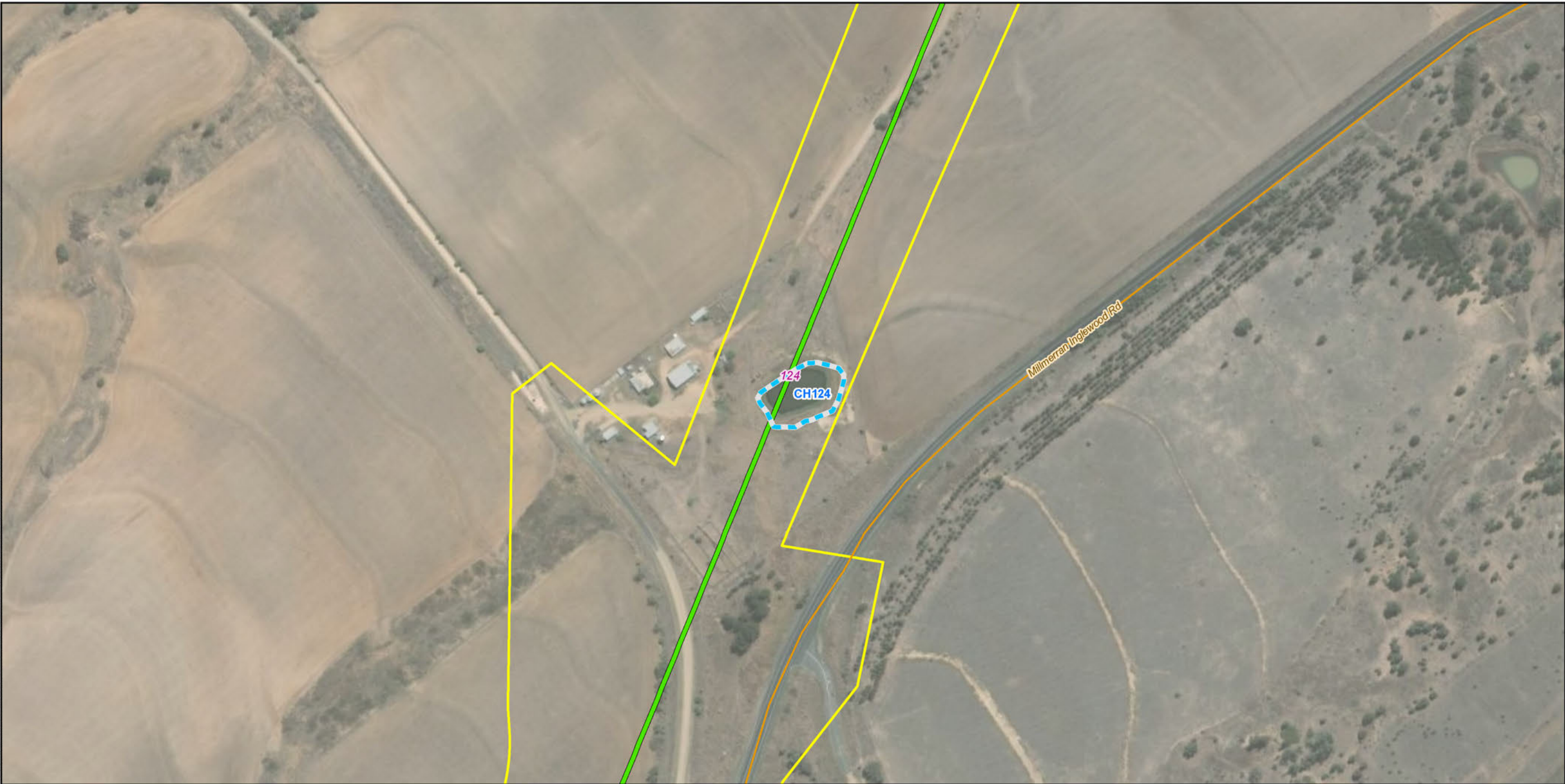
- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

*Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.*



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km

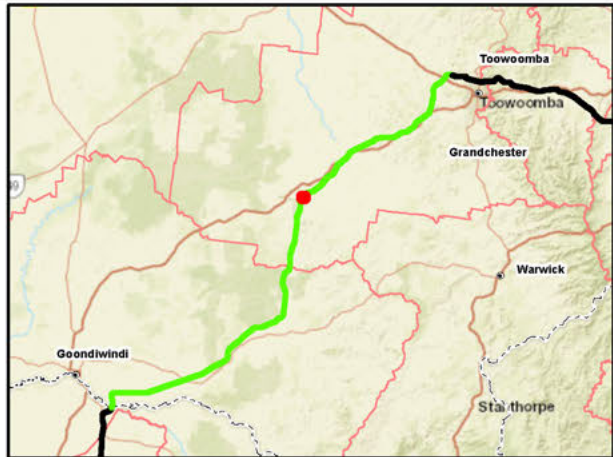




**Legend**

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

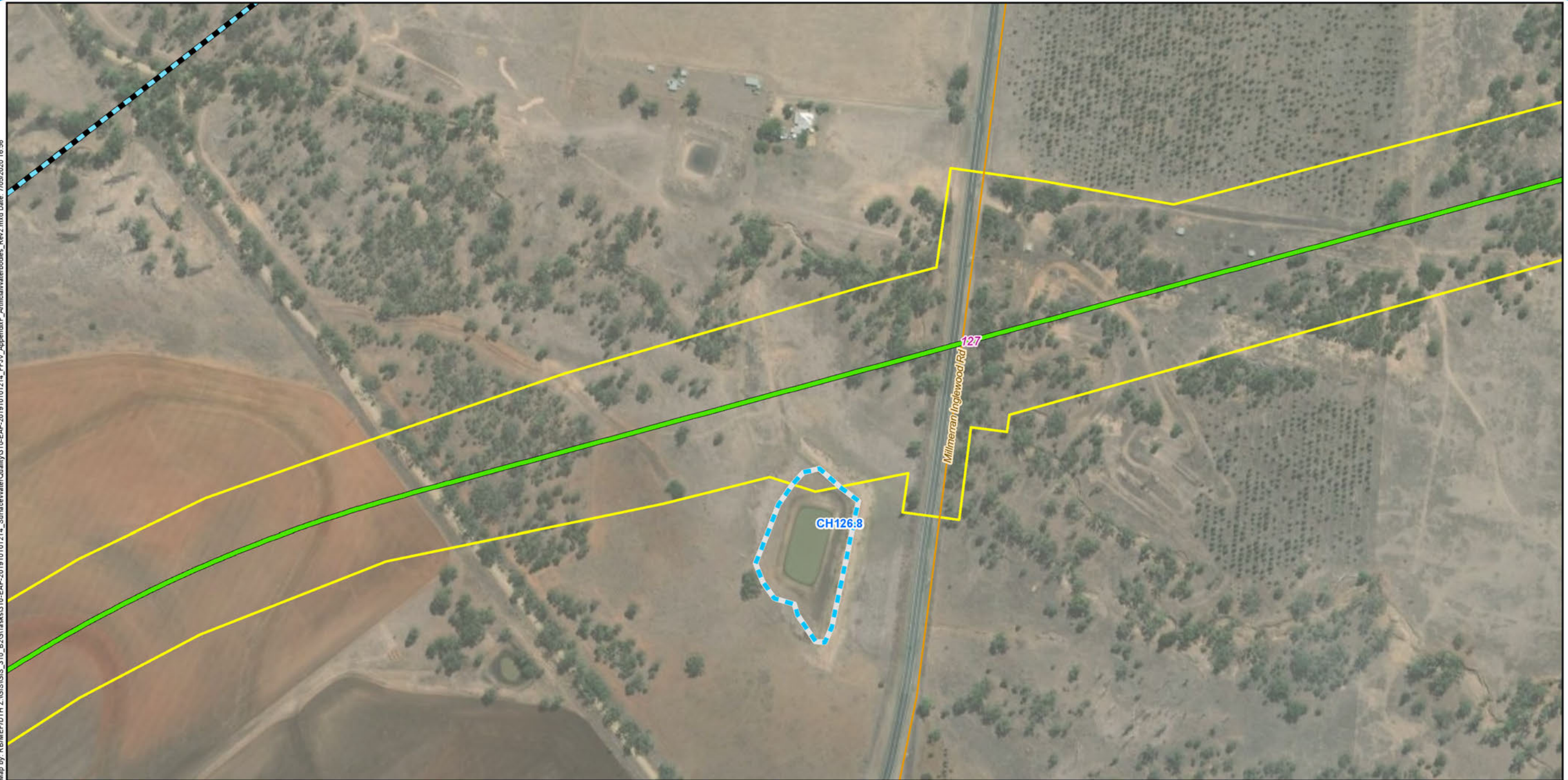
**NSW/QLD border to Gowrie**

**Appendix F(ae):**

**Artificial waterbodies which intersect with the Project disturbance area**



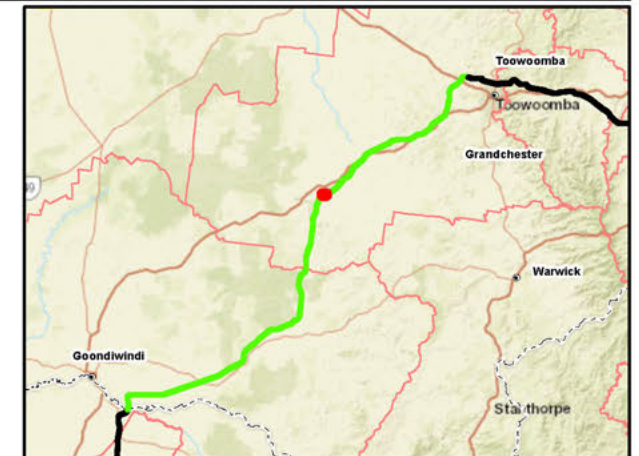
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#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



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 Coordinate System: GDA 1994 MGA Zone 56

**NSW/QLD border to Gowrie**  
**Appendix F(af):**

**Artificial waterbodies which intersect with the Project disturbance area**



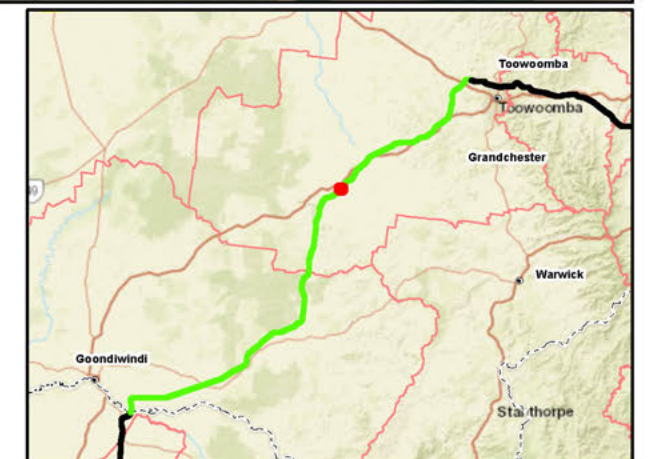
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#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



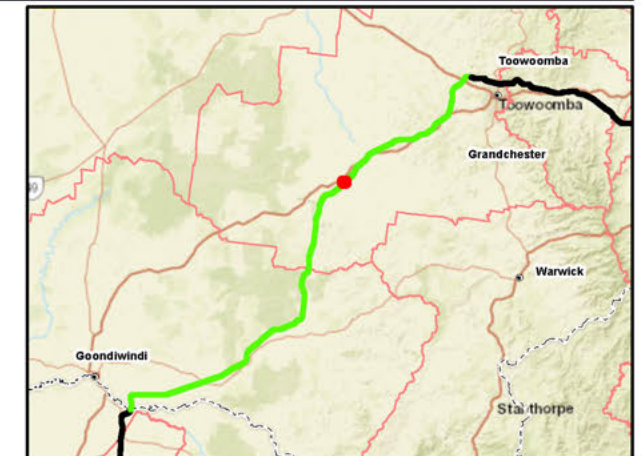
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#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
0 0.025 0.05 0.075 0.1 0.125 km



Map by: RB/MEF/DTM 2:GIS/GIS\_310\_B2G/Task310-EAP-201910101214\_SurfaceWaterQuality310-EAP-201910101214\_FFIV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

*Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.*



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km

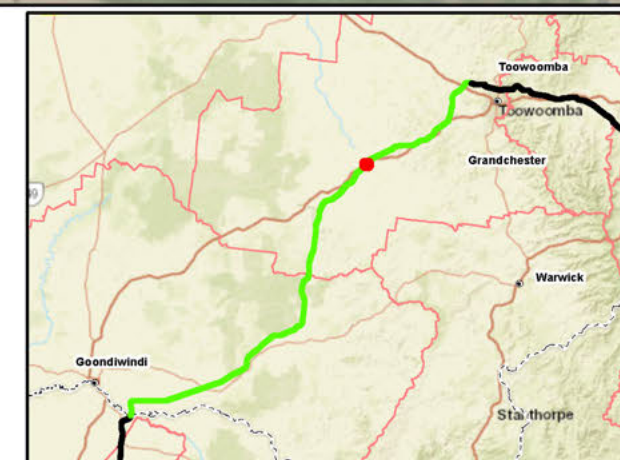




### Legend

- 5 Chainage (km)
 — Major roads
 ■ Artificial / constructed waterbodies
- NSW/QLD border to Gowrie alignment
  Project footprint
- Defined watercourses (Water Act 2000)

*Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.*



A3 scale: 1:3,500

0 0.025 0.05 0.075 0.1 0.125km



Issue date: 18/10/2019    Version: 0  
Coordinate System: GDA 1994 MGA Zone 56

**NSW/QLD border to Gowrie**  
**Appendix F(a):**

### Artificial waterbodies which intersect with the Project disturbance area



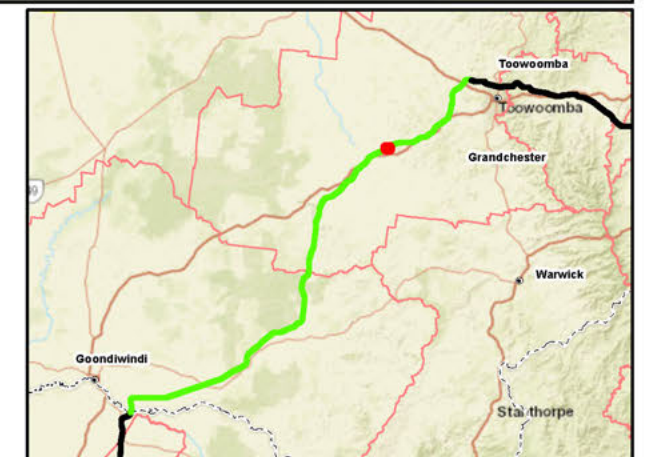
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#### Legend

- 5 Chainage (km)
- Existing rail
- NSW/QLD border to Gowrie alignment
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



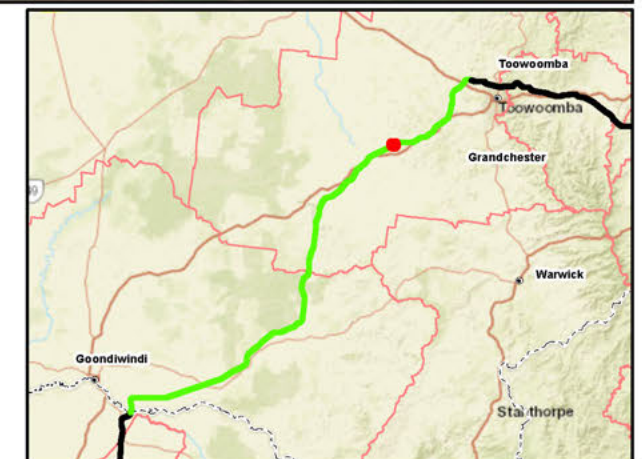
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#### Legend

- 5 Chainage (km)
- + Existing rail
- NSW/QLD border to Gowrie alignment
- Minor roads
- - - Artificial / constructed waterbodies
- Project footprint

*Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.*



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



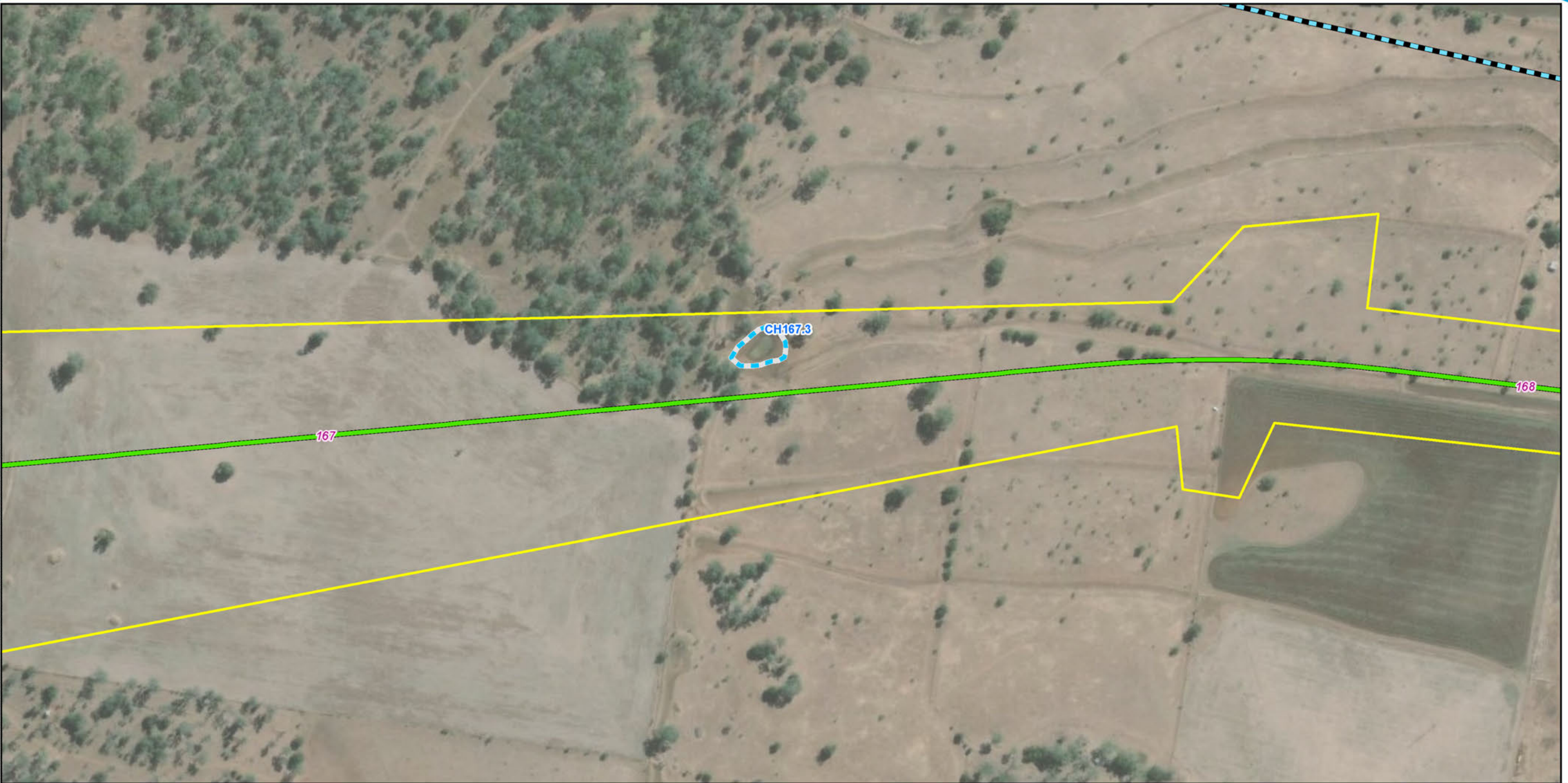
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Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

**NSW/QLD border to Gowrie**  
**Appendix F(al):**

**Artificial waterbodies which intersect with the Project disturbance area**





**Legend**

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



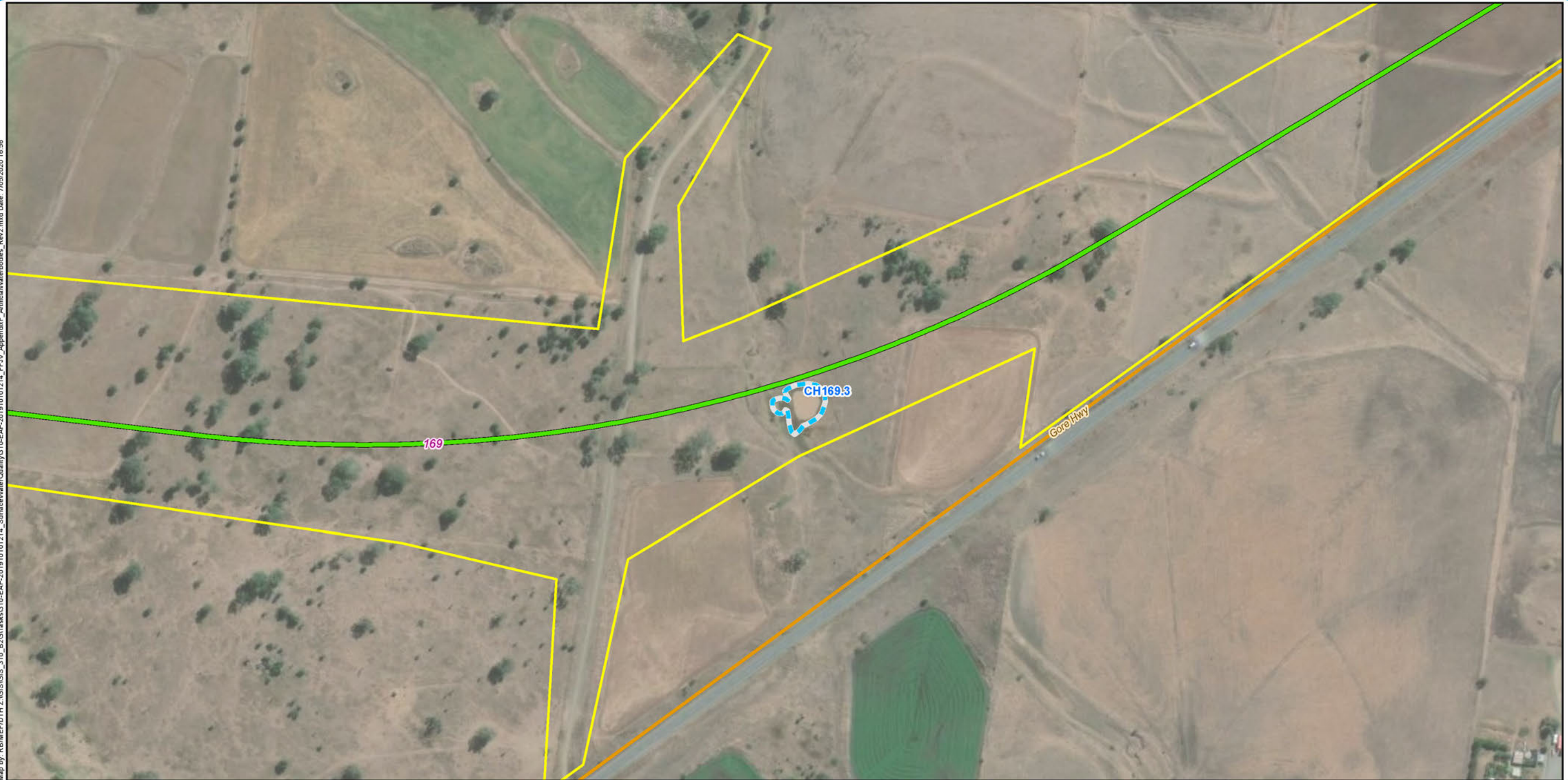
Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

**NSW/QLD border to Gowrie  
 Appendix F(am):**

**Artificial waterbodies which intersect with the Project disturbance area**



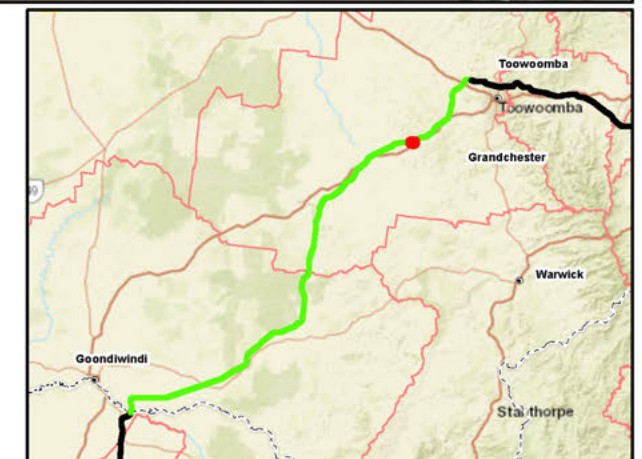
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#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Major roads
- Artificial / constructed waterbodies
- Project footprint

*Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.*



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



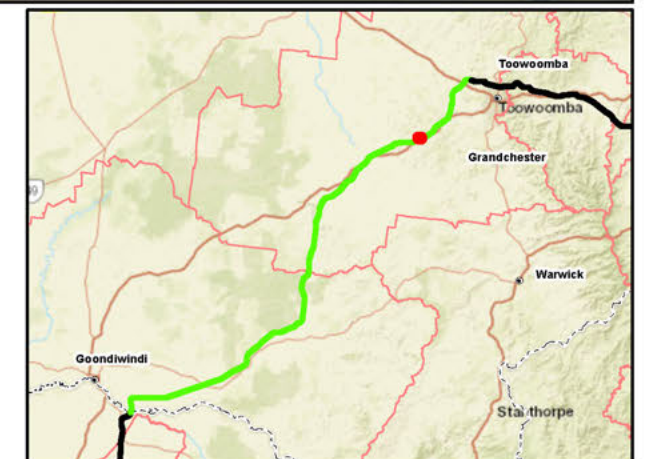
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#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Major roads
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



Map by: RB/MEF/DTM 2:GIS/GIS\_310\_B2G/Task310-EAP-201910101214\_SurfaceWaterQuality310-EAP-201910101214\_FFIV\_AppendixF\_ArtificialWaterbodies\_Rev2.mxd Date: 7/05/2020 16:56



#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Major roads
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

#### NSW/QLD border to Gowrie Appendix F(ap):

#### Artificial waterbodies which intersect with the Project disturbance area



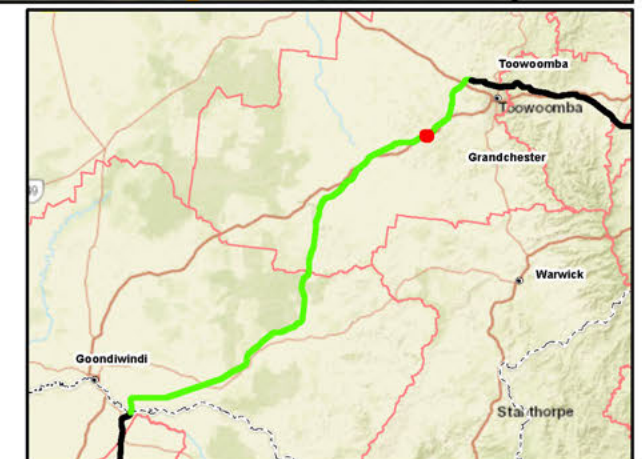
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#### Legend

- 5 Chainage (km)
- Existing rail
- NSW/QLD border to Gowrie alignment
- Major roads
- Minor roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

#### NSW/QLD border to Gowrie Appendix F(aq):

#### Artificial waterbodies which intersect with the Project disturbance area



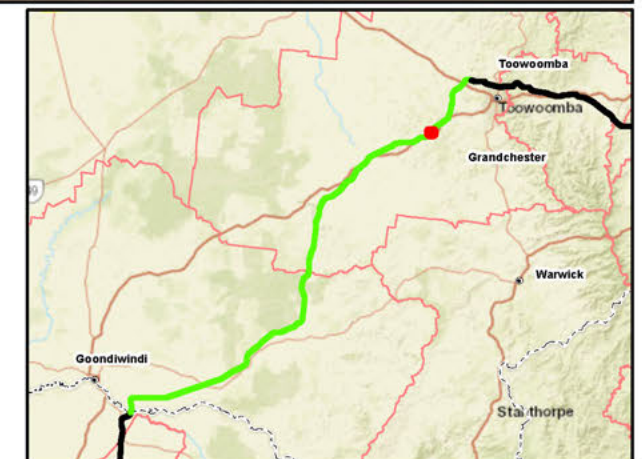
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#### Legend

- 5 Chainage (km)
- Existing rail
- NSW/QLD border to Gowrie alignment
- Major roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



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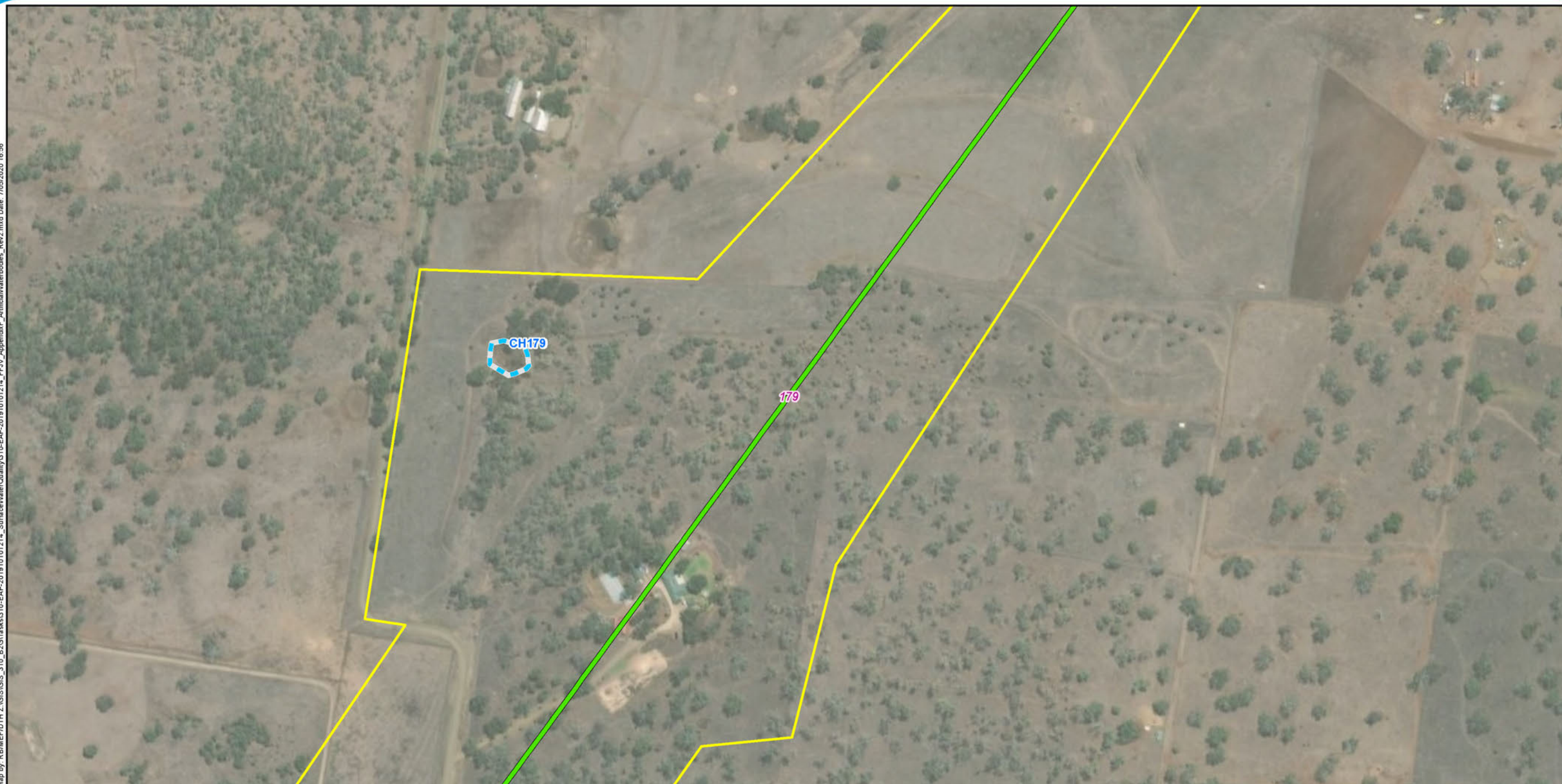
Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

**NSW/QLD border to Gowrie**  
**Appendix F(ar):**

**Artificial waterbodies which intersect with the Project disturbance area**



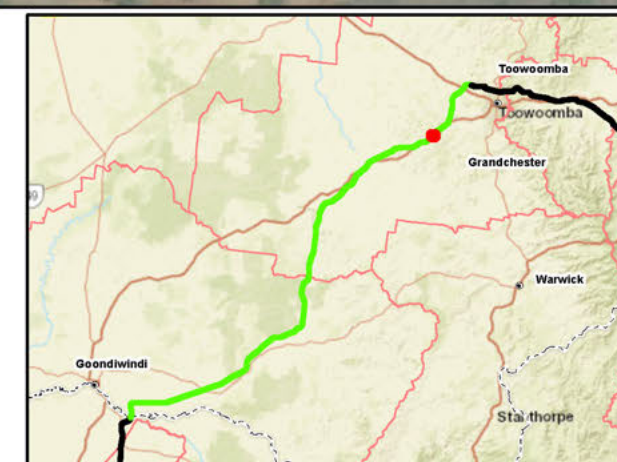
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# Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

## NSW/QLD border to Gowrie Appendix F(as):

Artificial waterbodies which intersect with the Project disturbance area



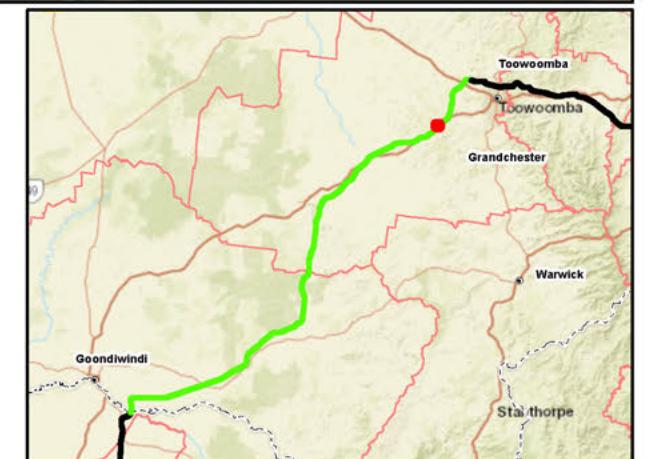
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#### Legend

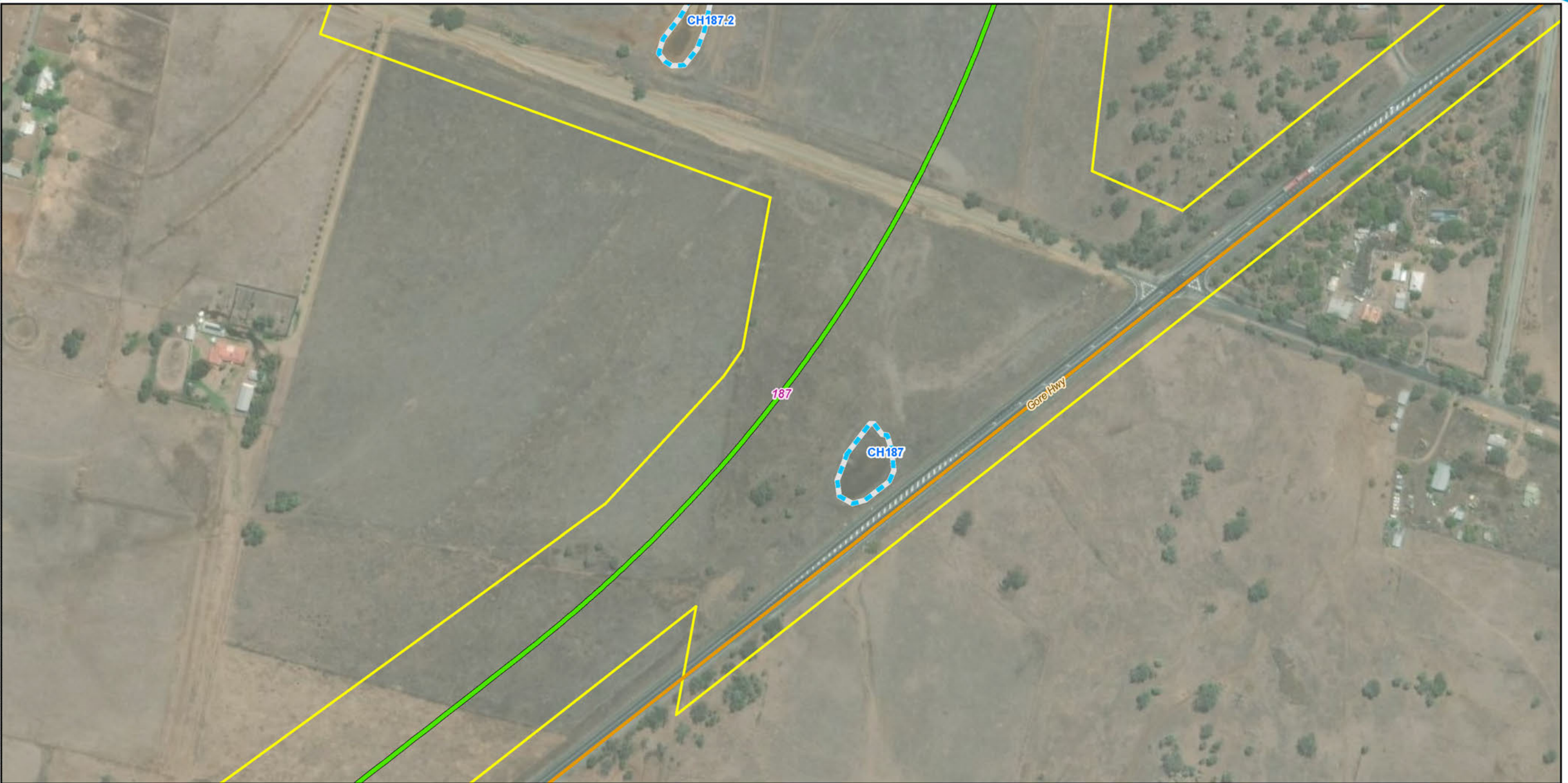
- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- - - Artificial / constructed waterbodies
- Project footprint

*Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.*



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km

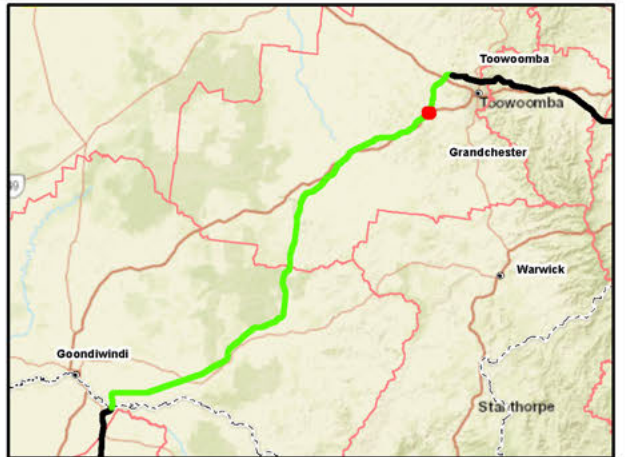




**Legend**

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Major roads
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
0 0.025 0.05 0.075 0.1 0.125 km



Issue date: 18/10/2019 Version: 0  
Coordinate System: GDA 1994 MGA Zone 56

**NSW/QLD border to Gowrie**  
**Appendix F(au):**

**Artificial waterbodies which intersect with the Project disturbance area**



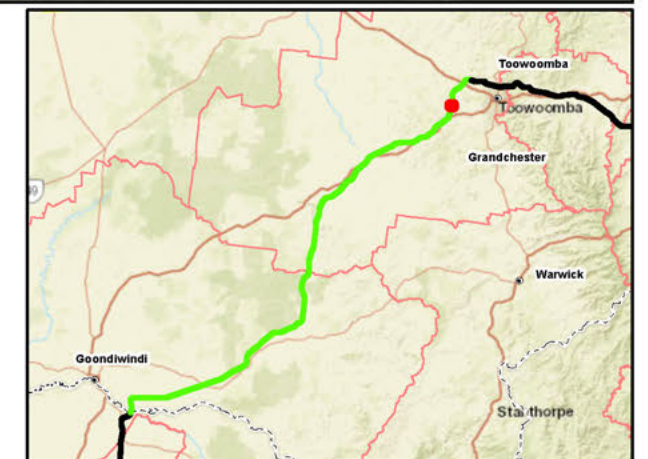
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#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



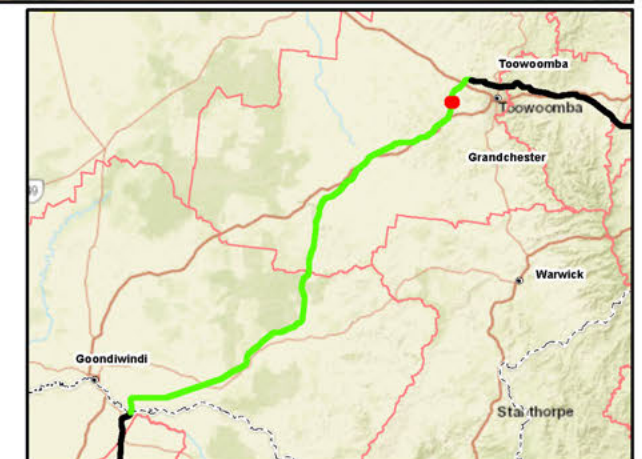
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#### Legend

- 5 Chainage (km)
- NSW/QLD border to Gowrie alignment
- Artificial / constructed waterbodies
- Project footprint

Artificial waterbodies are presented here labelled to an approximate kilometre chainage for illustrative purposes and for cross-referencing within the report.



A3 scale: 1:3,500  
 0 0.025 0.05 0.075 0.1 0.125 km



Issue date: 18/10/2019 Version: 0  
 Coordinate System: GDA 1994 MGA Zone 56

NSW/QLD border to Gowrie  
 Appendix F(a):

Artificial waterbodies which intersect with the Project disturbance area



# APPENDIX

# P

## Surface Water Quality Technical Report

### **Appendix G** Culverts Included in the Reference Design Across Floodplains

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT



## Appendix G

# Culverts included in the reference design across floodplains

The tables below present the number, location and sizing of culverts included in the reference design for the following floodplains:

- Gowrie Creek
- Westbrook Creek and Dry Creek
- Condamine River
- Back Creek
- Nicol Creek
- Bringalily Creek
- Cattle Creek
- Pariagara Creek
- Macintyre Brook
- Macintyre River.

Culvert types are reinforced concrete pipes (RCP) and reinforced concrete box culverts (RCBC).

**Table G1** Gowrie Creek – Floodplain structure locations and details

Approximate chainage (km)	Structure ID	Structure type	No. of cells	Diameter/width x height (m) <sup>1</sup>
203.17	C203.17	RCP	2	1.05
204.92	C204.92	RCP	2	1.05
205.09	C205.09	RCP	12	1.05
205.14	C205.14	RCP	2	1.05
205.30	C205.30	RCP	4	1.05
205.37	C205.37	RCP	15	1.05
205.47	C205.47	RCP	5	1.05
205.60	C205.60	RCP	2	1.05
205.87	C205.87	RCP	7	1.05
206.95	C206.95	RCBC	16	2.40 x 1.20

**Table note:**

1 For RCP height equals diameter

**Table G2** Westbrook Creek and Dry Creek – Floodplain structure locations and details (culverts)

Approximate chainage (km)	Structure ID	Structure type	No of cells	Diameter/width x height (m) <sup>1</sup>
188.72	C188.72	RCBC	11	1.80 x 1.20
191.83	C191.83	RCP	5	2.70
193.38	C193.38	RCBC	2	1.50 x 0.90
193.41	C193.41	RCP	3	1.05
195.64	C195.64	RCP	14	1.05
195.93	C195.93	RCP	2	1.05
196.03	C196.03	RCP	2	1.05



Approximate chainage (km)	Structure ID	Structure type	No of cells	Diameter/width x height (m) <sup>1</sup>
197.42	C197.42	RCP	15	2.40
197.49	C197.49	RCP	11	1.50
197.53	C197.53	RCP	10	1.20
197.71	C197.71	RCP	17	1.05
198.26	C198.26	RCP	15	1.05

**Table note:**

<sup>1</sup> For RCP height equals diameter

**Table G3**      **Condamine River – Floodplain structure locations and details (culverts)**

Approximate chainage (km)	Structure ID	Structure type	No of cells	Diameter/width x height (m) <sup>1</sup>
131.39	C131.39	RCP	1	2.10
131.49	C131.49	RCP	1	2.10
137.83	C137.83	RCP	8	1.35
137.88	C137.88	RCP	11	1.65
137.92	C137.92	RCP	8	1.80
139.37	C139.37	RCP	11	1.80
139.44	C139.44	RCP	8	2.10
139.50	C139.5	RCP	8	2.10
139.56	C139.56	RCP	11	1.80
139.71	C139.71	RCP	9	1.65
139.73	C139.73	RCBC	4	2.4 x 1.8
139.78	C139.78	RCP	10	2.10
140.09	C140.09	RCP	7	1.80
140.11	C140.11	RCP	7	1.80
140.17	C140.17	RCP	6	2.10
140.21	C140.21	RCP	6	2.10
140.23	C140.23	RCP	6	2.10
140.25	C140.25	RCP	6	2.10
140.27	C140.27	RCP	6	2.10
140.32	C140.32	RCP	6	2.10
140.38	C140.38	RCP	6	2.10
140.40	C140.4	RCP	6	2.10
140.43	C140.43	RCP	7	1.80
140.46	C140.46	RCP	5	2.10
140.49	C140.49	RCP	6	2.10
140.51	C140.51	RCP	6	2.10
140.55	C140.55	RCP	5	2.10
140.59	C140.59	RCP	5	2.10
140.64	C140.64	RCP	6	2.10
140.67	C140.67	RCP	5	2.10
140.78	C140.78	RCP	6	2.10
140.83	C140.83	RCP	6	2.10
140.87	C140.87	RCP	4	2.10



Approximate chainage (km)	Structure ID	Structure type	No of cells	Diameter/width x height (m) <sup>1</sup>
140.91	C140.91	RCP	6	2.10
140.98	C140.98	RCP	6	2.10
141.03	C141.03	RCP	4	2.10
141.07	C141.07	RCP	6	2.10
141.11	C141.11	RCP	6	2.10
141.20	C141.2	RCP	6	2.10
141.24	C141.24	RCP	6	2.10
141.29	C141.29	RCP	6	2.10
141.32	C141.32	RCP	4	2.10
142.02	C142.02	RCP	6	2.10
142.04	C142.04	RCP	6	2.10
142.08	C142.08	RCP	6	2.10
142.13	C142.13	RCP	6	2.10
142.15	C142.15	RCP	6	2.10
142.19	C142.19	RCP	6	2.10
142.22	C142.22	RCP	6	2.10
142.25	C142.25	RCP	6	2.10
142.28	C142.28	RCP	5	2.10
142.36	C142.36	RCP	6	2.10
142.41	C142.41	RCP	6	2.10
142.44	C142.44	RCP	6	2.10
142.48	C142.48	RCP	6	2.10
142.50	C142.5	RCP	5	2.10
142.54	C142.54	RCP	4	2.10
142.58	C142.58	RCP	5	2.10
145.16	C145.16	RCBC	4	1.20 x 0.90
145.21	C145.21	RCBC	4	1.20 x 0.90
145.25	C145.25	RCBC	4	1.20 x 0.90
145.32	C145.32	RCBC	2	1.20 x 0.90
145.40	C145.4	RCBC	6	1.20 x 0.90
145.72	C145.72	RCBC	10	1.50 x 0.90
145.83	C145.83	RCBC	4	1.20 x 0.90
145.89	C145.89	RCBC	10	1.50 x 0.90
145.92	C145.92	RCBC	4	1.20 x 0.90
145.98	C145.98	RCBC	4	1.20 x 0.90
146.03	C146.03	RCBC	10	1.50 x 0.90
146.56	C146.56	RCBC	6	1.20 x 0.60
146.62	C146.62	RCBC	4	1.20 x 0.60
147.58	C147.58	RCP	6	1.05
147.63	C147.63	RCP	6	1.05
147.66	C147.66	RCP	6	1.05
147.73	C147.73	RCP	7	1.05



Approximate chainage (km)	Structure ID	Structure type	No of cells	Diameter/width x height (m) <sup>1</sup>
149.39	C149.39	RCP	10	1.35
149.42	C149.42	RCP	12	1.20
149.45	C149.45	RCP	3	1.35
149.76	C149.76	RCP	8	1.20
149.80	C149.8	RCP	8	1.20
149.83	C149.83	RCP	8	1.20
149.87	C149.87	RCP	6	1.35
149.91	C149.91	RCP	6	1.35
149.96	C149.96	RCP	8	1.20
150.01	C150.01	RCP	8	1.05

**Table note:**

<sup>1</sup> For RCP height equals diameter

**Table G4 Back Creek – Floodplain structure locations and details (culverts)**

Approximate chainage (km)	Structure ID	Structure type	No. of cells	Diameter (m)
126.76	C126.76	RCP	12	2.10
126.80	C126.80	RCP	12	2.10

**Table G5 Nicol Creek – Floodplain structure locations and details (culverts)**

Approximate chainage (km)	Structure ID	Structure type	No of cells	Diameter (m)
104.94	C104.94	RCP	18	0.90
105.09	C105.09	RCP	6	0.90
105.11	C105.11	RCP	6	0.90
105.13	C105.13	RCP	6	0.90

**Table G6 Bringalily Creek – Floodplain structure locations and details (culverts)**

Approximate chainage (km)	Structure ID	Structure type	No of cells	Diameter/width x height (m) <sup>1</sup>
100.00	C100.00	RCP	8	1.50
99.84	C99.84	RCP	14	0.90
99.38	C99.38	RCP	17	0.90
97.29	C97.29	RCP	2	0.90
98.87	C98.87	RCP	1	1.50
99.77	C99.77	RCP	1	1.50
98.36	C98.36	RCP	10	0.90
97.38	C97.38	RCP	2	0.90
96.20	C96.20	RCBC	8	2.40 x 1.20
94.91	C94.91	RCBC	5	2.41 x 0.90
95.07	C95.07	RCBC	15	2.40 x 1.50

**Table note:**

<sup>1</sup> For RCP height equals diameter.



**Table G7 Cattle Creek – Floodplain structure locations and details (culverts)**

Approximate chainage (km)	Structure ID	Structure type	No of cells	Diameter/width x height (m) <sup>1</sup>
87.37	C87.37	RCP	6	2.10
87.19	C87.19	RCBC	15	2.40 x 1.50

**Table note:**

1 For RCP height equals diameter

**Table G8 Pariagara Creek – Floodplain structure locations and details (culverts)**

Approximate chainage (km)	Structure ID	Structure type	No of cells	Diameter/width x height (m) <sup>1</sup>
68.75	C68.75	RCBC	40	2.1 x 2.1
66.23	C66.23	RCBC	8	2.4 x 1.5
69.80	C69.80	RCP	5	1.8
69.67	C69.67	RCP	5	1.8
69.54	C69.54	RCP	5	1.8
69.41	C69.41	RCP	5	1.8
69.28	C69.28	RCP	2	1.8
69.21	C69.21	RCP	2	1.8
69.14	C69.14	RCP	2	1.5
69.10	C69.10	RCP	2	1.2
69.02	C69.02	RCP	2	1.2
68.89	C68.89	RCP	2	1.2
67.57	C67.57	RCP	8	1.2
67.64	C67.64	RCP	8	1.2
67.70	C67.70	RCP	8	1.2
67.83	C67.83	RCP	20	1.2
67.96	C67.96	RCP	20	1.2
68.09	C68.09	RCP	20	1.2
68.41	C68.41	RCP	20	1.2

**Table notes:**

1 For RCP height equals diameter

**Table G9 Macintyre Brook (Yelarbon to Inglewood) – Floodplain structure details (culverts)**

Approximate chainage (km)	Structure ID	Structure type	No. of cells	Diameter/width x height (m) <sup>1</sup>
25.15	C25.15	RCBC	1	3.00 x 0.60
25.19	C25.19	RCBC	1	3.00 x 0.60
25.46	C25.46	RCP	21	0.90
25.50	C25.50	RCP	21	0.90
25.80	C25.80	RCBC	24	2.40 x 0.90
25.87	C25.87	RCBC	24	2.40 x 0.90
25.95	C25.95	RCBC	1	3.00 x 0.50
25.97	C25.97	RCBC	1	3.00 x 0.50
27.05	C27.05	RCBC	15	1.50 x 1.20
27.15	C27.15	RCBC	15	1.50 x 1.20
27.24	C27.24	RCBC	25	1.50 x 1.20
27.33	C27.33	RCBC	25	1.50 x 1.20



Approximate chainage (km)	Structure ID	Structure type	No. of cells	Diameter/width x height (m) <sup>1</sup>
27.42	C27.42	RCBC	20	1.50 x 1.20
27.53	C27.53	RCBC	20	1.50 x 1.20
42.87	C42.88	RCP	15	0.90
43.02	C43.02	RCP	15	1.20
43.08	C43.08	RCP	30	1.20
43.16	C43.16	RCBC	9	3.00 x 1.50
43.34	C43.34	RCP	45	1.20
43.56	C43.56	RCP	10	1.20
43.66	C43.66	RCP	15	1.20
43.77	C43.77	RCP	15	1.20
43.86	C43.86	RCP	15	1.20
43.97	C43.97	RCP	15	1.20
44.32	C44.32	RCP	15	1.20
44.67	C44.67	RCP	15	1.20
44.88	C44.88	RCP	30	0.90
44.99	C44.99	RCP	35	0.90
45.24	C45.24	RCP	35	0.90
45.30	C45.30	RCP	35	0.90
45.39	C45.39	RCP	40	0.90
45.46	C45.46	RCP	40	0.90
45.53	C45.53	RCP	40	0.90
45.67	C45.67	RCP	7	0.90

**Table note:**

1 For RCP height equals diameter

**Table G10 Macintyre River (north of NSW/QLD border) – Floodplain structure locations and details (culverts)**

Approximate chainage (km)	Structure ID	Structure type	No. of cells	Diameter/width x height (m) <sup>1</sup>
31.26 (NS2B)	C31.26	RCP	10	1.80
31.32 (NS2B)	C31.32	RCP	10	1.80
31.87 (NS2B)	C31.87	RCP	15	0.90
31.97 (NS2B)	C31.97	RCP	15	0.90

**Table notes:**

1 For RCP height equals diameter