3 TOPOGRAPHY AND GEOMORPHOLOGY

Chapter 3 provides an overview of the existing topography and geomorphology characteristic of the Pipeline Component of the Queensland Curtis LNG (QCLNG) Project and outlines expected impacts.

In particular, the chapter considers two proposed options for the route of the Export Pipeline. *Volume 2*, *Chapter 12* describes these options and the process for selection of the final route. Topography and geomorphology of the options are identical. This allows impacts and mitigation strategies to be considered prior to a decision on final alignment.

3.1 PROJECT ENVIRONMENTAL OBJECTIVE AND VALUES

The Project environmental objective for topography and geomorphology is to maintain a stable landform that does not result in uncontrolled erosion.

The following sections outline the existing environmental values relating to topography and geomorphology.

The proposed pipeline routes for the core parts of the Pipeline Component, the Export Pipeline, Lateral Pipeline and Collection Header, will traverse land[1] with broadly varying topography and characteristics. This includes steep topography associated with the Great Dividing Range, level or gently sloping country through Central Queensland and marine and tidal areas associated with the Export Pipeline crossing to Curtis Island. The maximum elevation at any point[2] is around 550 m for the Export Pipeline where it passes over the Callide Range (kilometre points, or KP 295) and the lowest elevation is associated with the Export Pipeline crossing to Curtis Island.

Very steep areas, where slopes may exceed 15 per cent, are located on the Export Pipeline route between KP 280 and KP 285 and KP 288 and KP 295 which is to the east of the Callide Power Station area crossing the Callide Range. Areas of steep slopes are located on the Lateral Pipeline route between KP 110 and KP 122 and KP 135 and KP 148.

Other steep areas that present potential topographic constraints to pipeline development on the Export Pipeline (refer *Figure 4.3.1*) comprise:

- KP 205 to KP 210
- KP 216 to KP 220
- KP 245 to KP 248
- KP 260 to KP 265

1 Land zones represent major differences in geology and in the associated land forms, soils and physical processes that give rise to distinctive landforms or continue to shape them.

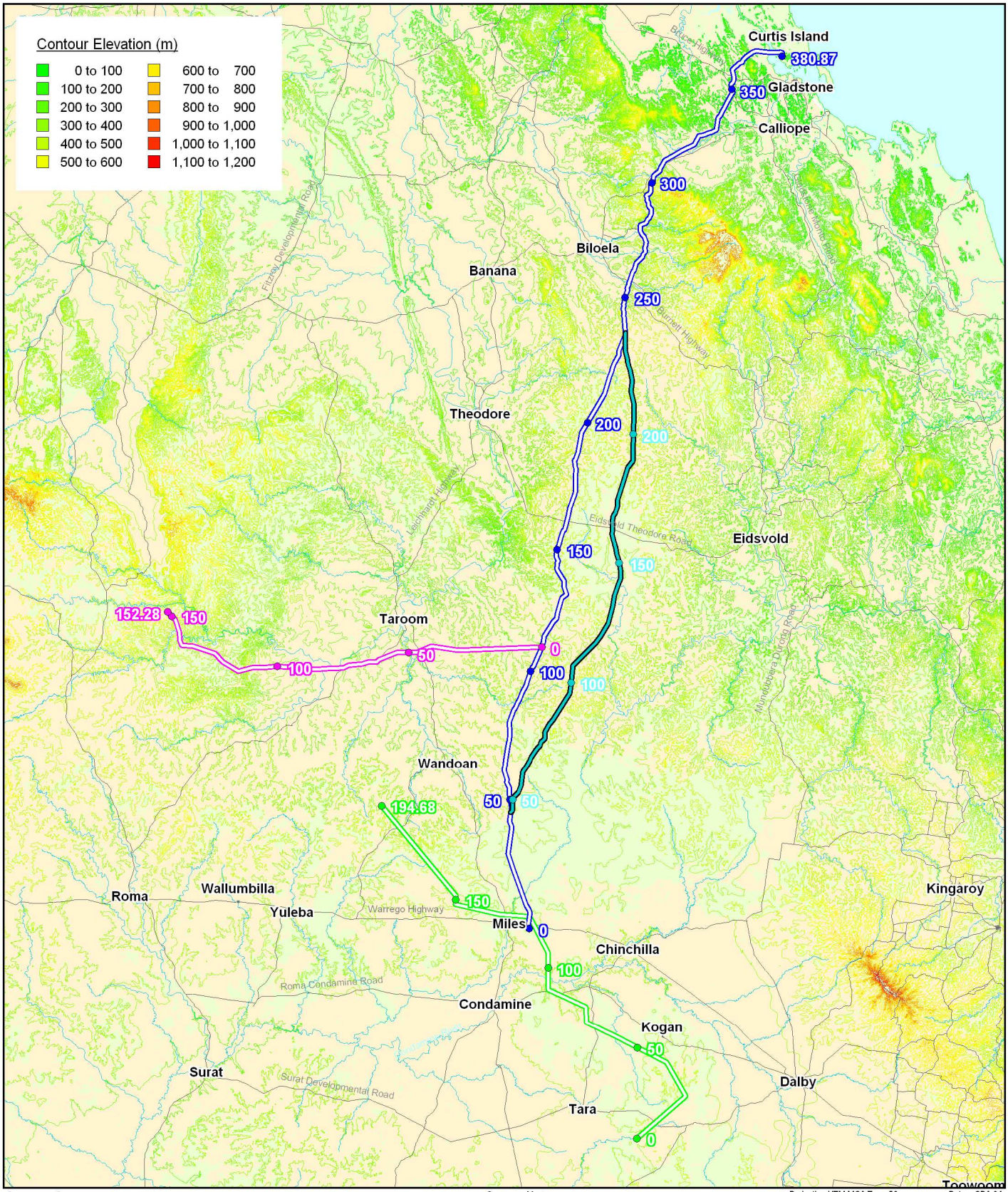
2 Heights are based on the Australian Height Datum (AHD).

- KP 270 to KP 274.

There are no significant topographical or other biophysical features within any of the pipeline corridors that are likely to be of high conservation value.

Table 4.3.1 Land Zones

Land Zone	Approximate Extent of Land Zone		
	Export Pipeline	Collection Header	Lateral
	(km)	(km)	(km)
Tidal flats and beaches	3		
Alluvium (River and creek flats)	44	32	29
Clay plains not associated with current alluvium	7	18	
Old loamy and sandy plains	60	45	
Ironstone jump-ups	54	57	
Basalt plains and hills	5		
Undulating country on fine grained sedimentary rocks	50	28	81
Sandstone ranges	7	2	43
Hills and lowlands on metamorphic rocks	50		
Hills and lowlands on granitic rocks	100		
Other	2 (Ocean)	12 (Not determined)	



Legend:

- Export Pipeline & Kilometre Point
- Lateral Pipeline & Kilometre Point
- Upstream Infrastructure Corridor & Kilometre Point
- Export Pipeline Option 2 & Kilometre Point

Source Note:
1:250,000 Topographic vector copyright Geoscience Australia

Projection UTM MGA Zone 56 Datum GDA 94

0 20 40 60 80
Kilometres

N

QUEENSLAND CURTIS LNG
A BG Group business

Project	Queensland Curtis LNG Project
Client	QGC - A BG Group business
Title	**Topography**

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3.2 POTENTIAL IMPACTS AND MITIGATION

Construction and operation of Pipeline Component infrastructure may impact on steep slopes and deeply dissected terrain by:

- requiring additional disturbance to allow access for specialist heavy machinery
- requiring alternative design for excavations, levelling of sites for hardstand areas for aboveground infrastructure
- requiring special measures to build access tracks with appropriate grade.

Pipeline routes across the Pipeline Component were selected to avoid or minimise impacts associated with topographical and geomorphology constraints. The Export Pipeline will require minimal landform modification although crossing of significant watercourses with high riverbanks will require careful management as described in *Volume 4, Chapter 9*. The slope of the Export Pipeline route will also influence the erosion potential and this is discussed further in *Volume 4, Chapter 4.*

Mitigation measures to ensure no long-term adverse impacts to the topography and geomorphology of Pipeline Component routes are addressed in *Volume 4, Chapter 4.*

3.3 CONCLUSION

The implementation of appropriate control measures during construction will ensure that any impacts from the Pipeline Component of the Queensland Curtis LNG (QCLNG) Project are of a temporary nature and limited to the immediate construction area.

A summary of the impacts outlined in this chapter is provided in *Table 4.3.2.*

Table 4.3.2 Summary of Impacts for Topography and Geomorphology

Impact assessment criteria	Assessment outcome
Impact assessment	Negative
Impact type	Direct
Impact duration	Short term
Impact extent	Local
Impact likelihood	High

Overall assessment of impact significance: negligible, based on the successful implementation of the proposed mitigation measures described in *Volume 4, Chapter 4.*