

Section 4

Assessment and Management of Key Environmental Issues

PREAMBLE

This section of the Environmental Assessment provides relevant background information relating to the environmental aspects identified in Section 3. The following sub-sections provide information related to the existing environment and the proposed mitigation measures and management procedures that would be implemented throughout the life of the Project with respect to the following environmental issues.

- *Noise and blasting.*
- *Groundwater.*
- *Aboriginal heritage.*
- *Bushfire.*
- *Air quality and energy.*
- *Soils and land capability.*
- *Ecology.*
- *Surface water.*
- *Non-Aboriginal heritage.*
- *Traffic and transportation.*
- *Visual amenity.*
- *Socio-economic setting.*

A detailed assessment of the likely residual impacts and, where relevant, programs to monitor the potential environmental impacts, are also outlined.

Information is presented in sufficient detail to enable readers to fully understand the potential impacts of the Project, should it be approved. The extent of detail provided reflects the potential likelihood and severity of impacts and the priority for each environmental issue determined in Section 3.3.



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4.1 BACKGROUND

4.1.1 Introduction

The descriptions of various environmental aspects of the Project throughout this section are reliant upon a range of background information common to many of the key environmental issues. In this sub-section, background information is provided on the topography, climate, geology, land ownership and residences, land uses and the community surrounding the Project Site.

4.1.2 Topography and Drainage

4.1.2.1 Regional Topography and Drainage

The Project Site is located in an area of undulating hills located between two north - south trending ridgelines (**Figure 4.1**). The western ridgeline, located between approximately 15km and 20km to the west of the Project Site is a section of the Great Dividing Range with maximum elevations of approximately 1 346m AHD and 1 359m AHD at Mount Lowden (approximately 15km to the west-northwest of the Project Site) and Mount Cowangerong (approximately 23km to the southwest of the Project Site) respectively. To the west of the Great Dividing Range is a series of rolling to deeply incised hills.

The eastern ridgeline, located approximately 12km to the east of the Project Site, is unnamed with a maximum elevation of 965m AHD at Monga Mountain. This ridgeline peters out to the north of the Project Site. To the east of this ridgeline is a second, lower ridgeline and an east-sloping escarpment with average slopes of approximately 1:1 (V:H) down to coastal plain.

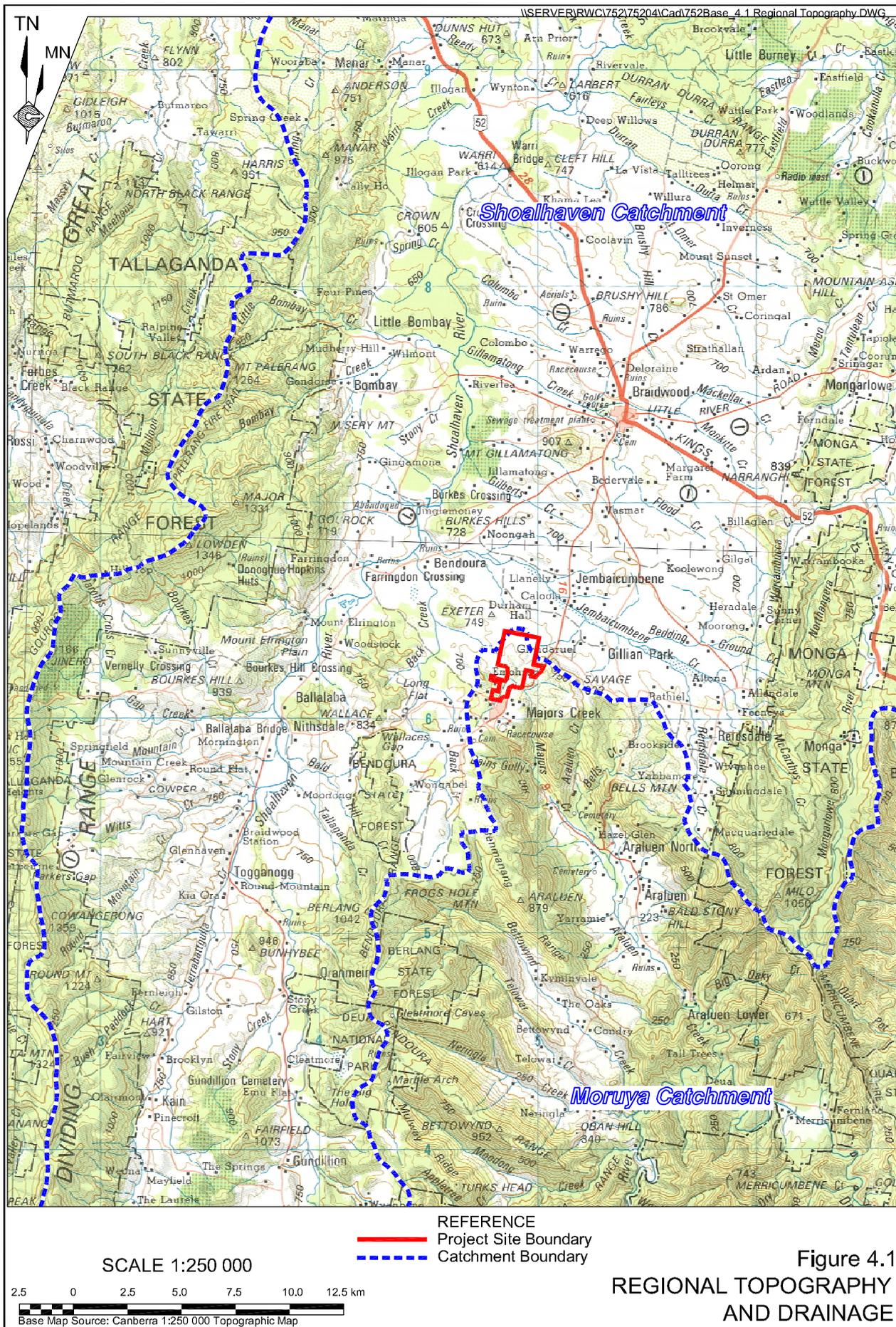
Approximately 1km to the south of the Project Site is deeply incised, south to southeast orientated, narrow valley with side slopes of up to 1:1 (V:H). The floor of the valley occurs at elevations approximately 500m lower than the head of the valley.

The area to the north of the Project Site is dominated by gently undulating hills with elevations between approximately 600m AHD and 800m AHD, with occasional steep sided hills. The highest point to the north of the Project Site is Mount Gillamatong, with a maximum elevation of 907m AHD. Slopes within the area to the north of the Project Site are typically less than 1:10 (V:H), with some more steeply sloped areas having slopes of up to approximately 1:5 (V:H).

The Project Site lies on the boundary of Shoalhaven and Moruya Catchments (**Figure 4.1**). The upper Shoalhaven Catchment covers an area of approximately 9 460km². Surface waters within the catchment flow to the Shoalhaven River which flows in northerly direction before turning east and flowing to the Pacific Ocean to the east of Nowra.

The Moruya Catchment covers an area of approximately 1 490km². Surface waters in the vicinity of the Project Site flow initially to Majors Creek, before flowing to Araluen Creek and the Deua River. The Deua River merges with the Moruya River and flows to the Pacific Ocean at Moruya.





4.1.2.2 Local Topography and Drainage

The topography surrounding the Project Site is presented on **Figure 4.2**. The area immediately to the north, west and east of the Project Site is typically gently undulating, with elevations ranging from 749m AHD at an unnamed hill to the northwest of the Project Site to approximately 650m AHD at the confluence of the Jembaicumbene Creek and the Shoalhaven River.

The topography immediately to the south of the Project Site is more steeply sloped, particularly to the south of the escarpment at the head of the Araluen Valley. Elevations to the south of the Project Site vary from 700m AHD to 300m AHD.

The northern section of the Project Site is within the Shoalhaven Catchment, with a number of unnamed drainages to the northeast of the Project Site draining to Jembaicumbene Creek and to the northwest draining to Back Creek. Both Back and Jembaicumbene Creeks merge with the Shoalhaven River approximately 7km to the northwest of the Project Site.

Jembaicumbene Creek, to the northeast of the Project Site, has been significantly disturbed by mining-related activities and now forms a series of pools and swampy areas.

The area to the southwest and southeast of the Project Site is dominated by Majors Creek which also flows through the southern section of the Project Site. The creek, which has its headwaters approximately 1km to the west of the Project Site, flows to the east before turning to the northeast within the Project Site and then to the south downstream of the Project Site. The creek flows over the escarpment into the Araluen Valley approximately 1.5km to the southeast of the Project Site.

4.1.2.3 Project Site Topography and Drainage

The topography within and immediately surrounding the Project Site is presented on **Figure 4.3**.

The northern section of the Project Site is typically gently undulating with elevations ranging from approximately 740m AHD on the northern boundary of the Project Site to 700m AHD at the head of a number of deeply incised creeks.

The undulating northern section of the Project Site is cut by a number of deeply incised creeks associated with Spring Creek and its tributaries. The slopes of these incised valleys are typically convex, with more gentle slopes on the upper sections and steeper slopes closer to the base of the valley. The surface water assessment (SEEC, 2010 – see Section 4.5) indicates that this reflects active natural erosion that has been exacerbated by past land use history, including alluvial gold mining and construction of water races and dams within the creek lines. SEEC (2010), however, note that the recent gully stabilisation works have successfully stabilised a number of formerly active gullies.

The southern section of the Project Site is dominated by Majors Creek and is typically moderately to gently undulating. Elevations within that section of the Project Site typically range from approximately 650m AHD to 620m AHD.



