Chapter 3:

Description of the Affected Environment

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3. DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 Introduction

This chapter provides a generic overview of the biophysical and socio-economic environment in the vicinity of the Port of Ngqura. The description focuses on those aspects of the environment that could be affected by, or could affect, the proposed extension to the container berths and the construction of the administration craft basin.

More specific information on the marine, transportation and socio-economic aspects of the environment are contained in chapters 6, 7 and 8 respectively.

The purpose of providing this environmental description (as presented in this chapter as well as in chapters 6, 7 and 8) is to assist the reader in understanding the possible linkages and interactions between the proposed project and the environment. This information has been sourced largely from previous EIAs conducted in the area.

Overall, the biophysical environment of the Eastern Cape coastal area is very diverse and contains a great variety of landscapes, habitats and species that are uncommon in other regions, as well as a largely unspoilt coastline. Socio-economically, it is one of the most impoverished regions of South Africa, but has great potential to experience continued improvement in living conditions if the resources of the area are managed sustainably.

3.2 Site location

The proposed project consists of two over-arching activities located within the Port of Ngqura, i.e. an extension to the container berths; and the construction and operation of an administration craft basin.

The Port of Ngqura lies within Algoa Bay at the mouth of the Coega River, between the Sundays River (to the east) and the Swartkops River (to the west), and approximately 15 km north-east of Port Elizabeth, in the Eastern Cape province of South Africa. The Port and associated Industrial Development Zone (IDZ) is situated within the Nelson Mandela Metropole, which includes the former Port Elizabeth, Uitenhage and Despatch municipalities.

The project requires the disposal of dredge material and consequently an offshore dredge disposal site within Algoa Bay has been identified. This site is located approximately 8km offshore from the Port of Ngqura in water depth ranging from approximately 29m to 37m. The location of the dredge disposal site is shown in Figure 2.6.

3.3 Biophysical environment

3.3.1 Climate

The Port of Ngqura and Coega IDZ is situated at the transition between the temperate and subtropical bioclimatic zones. Therefore, it receives rainfall throughout the year, with peaks in autumn (May to June) and spring (August to September). The highest monthly averages from 1980 to 1996 were from the months of May, June and August (CES, 2001(a)). The annual average rainfall is about 400 mm (Coetzee *et al.*, 1996).

3.3.2 Terrestrial features: landscape and geology

The locations for the proposed container berth extension and administration craft basin have already been heavily modified as a result of port construction. The offshore dredge disposal site is the same site as used during the construction of the Port of Ngqura and has also therefore been modified. Detailed descriptions of the physical characteristics and the marine ecology within the port and for the offshore disposal site are provided in Chapter 6.

The landforms of the area are primarily a function of the geology, and of climatic and coastal processes. The following two main landscape types occur within the vicinity of the project and are relevant to the proposed project:

- **The sandy coastline and coastal dunes:** There are approximately 20 km of fixed vegetated dunes along the Algoa Bay coastline. Neither the vegetated dunes, nor the mobile dune belt at Coega are actively involved in replenishing beach sand as they lie landward of the storm berm (Illenberger and Burkinshaw, 1996, as cited in CES, 2001(a)). Beach accretion and erosion is therefore predominantly a function of wave action and the longshore movement and deposition of sand, in which the net movement of sand is northwards. The dunes rise to approximately 50-60 m elevation east of the port. These lead onto the coastal plain and tend to visually separate the coastline from the main inland portion of the Coega IDZ and the N2 national road.

- **The offshore islands:** Algoa Bay contains two groups of islands, i.e. the St Croix/Brenton/Jahleel group in the south and the Bird Island group towards the north east. These islands are formed by outcrops of super-mature, erosion resistant Peninsula sandstone of the Table Mountain group and are poorly vegetated (CES, 2001(a)). The largest island, St Croix, is approximately 12ha in size. The other islands are considerably smaller. Jahleel Island, the closest to the Port of Ngqura, is located approximately 1km offshore, is approximately 2ha in size and does not rise more than 20m above sea level. At its closest point, the eastern breakwater of the Port of Ngqura is slightly more than 500m from Jahleel Island.

3.3.3 Vegetation

The Coega IDZ and Port are located in the Sub-Tropical Thicket biome which plays an important role as a buffer separating northern (summer rainfall) and southern (winter rainfall) floral regions. This biome extends roughly from Mossel Bay in the west to East London in the east and 100 – 200 km inland from the coast. A recently completed biological survey of the Sub-Tropical Thicket biome undertaken for the Terrestrial Ecology Research Unit (TERU) estimates this biome to include at least 1558 plant species, including 322 endemics (Vlok & Euston-Brown, 2002). In addition, it provides habitat to numerous rare and endangered animal species, some of which are described below. The survey resulted in the revision of the previous classification system for the different thicket types. This revised classification has been used by the CDC in their development of the primary network for the Coega IDZ's Open Space System which aims to conserve sensitive vegetation types, fauna habitats and ecological processes. The proposed project is within areas of the port already modified by development and does not impinge on any component of the Open Space System developed for the Port and IDZ.

3.3.4 Birds

The coastal birds and seabirds of Algoa Bay rely on the scattered special habitats provided by estuaries and river mouths, rocky shores, dunefields, reefs and the offshore islands. The Algoa Bay Island Nature Reserve consists of the Bird and St Croix (St Croix, Jahleel, Seal and Brenton island) Island groups, each of which has been declared an Important Bird Area as they are inhabited by threatened and endangered species (Barnes, 1998). The islands support globally significant populations of Cape gannets (*Morus capensis*), African Penguins (*Spheniscus demersus*) and Roseate Terns (*Sterna dougallii*). The largest gannet colony in the world is at Bird Island, the largest African Penguin colony in southern Africa is at St Croix, and the only confirmed sites where Roseate Terns breed in South Africa are at Bird and St Croix Islands, with a further possible breeding site being Jahleel Island.

3.3.5 Marine ecosystems

There are three important natural marine habitats that may be affected by the proposed project, in particular related to the disposal of dredge spoil:

- **Sandy beaches and surf zones** - Sandy beaches in the region extend eastwards from the Zwartkops River mouth. Surf zones fluctuate with wave height but may be 250-300m wide. Beach swash zones are usually shallow with low waves. Net sand transport on both the shore and the wave dominated shallow subtidal is north and north eastwards. This type of beach is characteristic of eastern Algoa Bay and has a wide distribution in the region.

- **Shallow subtidal environment** - In the vicinity of the Coega River mouth this zone is dominated by low relief emergent rock reefs interspersed by various grades of sands.

- **Rocky shores on Jahleel Island and in the vicinity of the Marine Growers abalone farm** - Rocky shores are not extensive in eastern Algoa Bay, being largely limited to isolated stretches immediately east of the Coega River mouth and the island shores of which those of Jahleel Island are closest to the Ngqura Port.

A major ecological feature of these beaches/surf zones is the development of dense patches of the diatom *Anaulus australis* which may comprise more than 95% of the total algal production. Consequently, this species is a critical component in the nearshore food web driving interstitial, microbial and macroscopic food chains. High concentrations of food organisms, *Anaulus* blooms and swarms of mysids, lead to eastern Algoa Bay surf zones being important nursery areas for a wide range of fish species.

At least ten species of marine mammals occur in Algoa Bay. Southern right whales use the shallow waters of Algoa Bay to give birth and nurse their young, and 200 to 400 humpback dolphins (about 30 % of SA's population) have the core of their habitat in Algoa Bay (Wooldridge *et al*., 1997). Dense concentrations of dolphins are located east of the Sundays River, using the surf zone as a feeding ground. The most easterly breeding colony of Cape Fur Seals *Arctocephalus pusillus* is located at Black Rocks in the Bird Island group (Wooldridge *et al*., 1997).

The biological structure of Algoa Bay beaches and surf zones is unique in South Africa and is considered to merit a high conservation status. This is reflected in the proposed incorporation of an expanded Marine Protected Area extending eastwards from the eastern breakwater of the Port of Ngqura, into the Greater Addo Elephant National Park.

3.4 Socio-economic environment

3.4.1 Demographics and human development

The Nelson Mandela Metropolitan Municipality (NMMM) had a population of approximately 1 million inhabitants in 2002. A significant percentage of this population is living in poverty (39%) and unemployment levels in the NMMM are estimated at around 40%. This is exacerbated in the urban areas, where 50% to 60% of adults are unemployed (CES, 2001(a)).

3.4.2 In-migration

Despite these realities, even higher levels of poverty and unemployment in the wider Eastern Cape province is contributing to the in-migration of job-seekers to the NMMM, and in particular, to areas in close proximity to the IDZ. An initial assessment for the proposed Port of Ngqura suggested that the population of Motherwell may be growing at a rate of 4.5% a year (CES, 2001(a)). This trend may be expected to increase as the development of the port and the Coega IDZ progresses.

The influx of people from surrounding areas is exacerbating the shortage of housing and other services such as schools and hospitals within the NMMM. Interviews conducted by the socio-economic specialist in 2002 for the EIA for the proposed Coega Aluminium Smelter established that housing schemes are, however, being developed to the north of Motherwell to provide for people residing in informal settlements around areas such as KwaZakhele and Zwide.

3.4.3 Initiatives to promote economic development

In order to reverse the above trends and stimulate and support socio-economic development, a number of initiatives are currently underway in the NMMM and surrounding areas. Key amongst these are the establishment of the Coega IDZ and the development of the Port of Ngqura, support services for the development of small-, medium- and micro-enterprises (SMMEs) and corporate social investment programmes. In addition, the expansion of the Addo Elephant National Park and the growth of the ecotourism sector in the Eastern Cape is being promoted for its conservation value as well as for the contribution that tourism and conservation initiatives can make to employment creation.