

RHODES UNIVERSITY

EXAMINATION: JUNE 2012

ENVIRONMENTAL SCIENCE HONOURS

ENVIRONMENTAL IMPACT ASSESSMENT

Internal Examiners: Dr Kevin Whittington-Jones

Marks: 100

Duration: 3 hours

External examiner: Dr Patrick O'Farrell

INSTRUCTIONS

1. This paper has three questions (1, 2 and 3)
2. Answer every question, noting the choice within questions
3. Number all answers correctly
4. Note that this paper has **SIX** pages

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QUESTION 1 (30 marks)

Please answer **THREE** of the following:

- a) Briefly discuss the purpose and content of an Environmental Management Plan (EMP). (10 marks)
- b) Briefly discuss the characteristics of a *good* EIA. (10 marks)
- c) Discuss what is meant by a Basic Environmental Assessment and describe the key steps of this process. (10 marks)
- d) Provide a brief description of the legal framework that guides an Environmental Assessment Practitioner (EAP) in South Africa as to whether a Basic Assessment or Scoping and EIA is required for a particular development. (10 marks)

QUESTION 2 (20 marks)

Please answer **ONE** of the following:

EITHER

- a) Provide a critical assessment of the purpose of an EIA and the extent to which this is realized. (20 marks)

OR

- b) Provide a critical assessment of the general approach to assessing the significance of impacts during an EIA. (20 marks)
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QUESTION 3 (50 marks)

Please answer **ONE** of the following:

EITHER

- a) With reference to the Kenmare case study (see **Appendix 1; starting on page 4**), briefly describe the **key steps** of the ESIA process that will need to be conducted. You are then required to describe the key environmental / social impacts (at least 10) likely to be associated with this development and provide a critical assessment of the options for mitigation of each these particular impacts and ways in which Kenmare can assess whether the mitigation measures have been effective. (50 marks)

OR

- b) With reference to the Kenmare case study (see **Appendix 1; starting on page 4**) and other literature that you have read during the module, discuss the importance of thorough stakeholder engagement and the potential challenges associated with engaging with the different stakeholder groups on **this** project. You are also required to provide a critical assessment of options to overcome the potential challenges of engaging effectively with each of the stakeholder groups associated with **this** project. (50 marks)

PLEASE SEE APPENDIX 1 ON THE FOLLOWING PAGE

APPENDIX 1: KENMARE RESOURCES CASE STUDY

1. BACKGROUND TO CASE STUDY

Kenmare Moma Mining (Mauritius) Limited (KMMML) and Kenmare Moma Processing Mauritius Limited (KMPML), collectively referred to as “Kenmare”, have been involved in developing a titanium mineral sands project in north-eastern Mozambique since 1987. In the 1990s Kenmare identified and explored further deposits in the coastal regions from Moma town to Mogincual. One of the sites showed significant mineralisation and is located north-east of the town of Moma, at 16°30'S, 39°40'E, hereafter referred to as the Moma titanium minerals deposit (Figure 1). KMMML/KMPML propose building a heavy mineral sands mine and processing operation in the Moma district of Nampula Province in northern Mozambique. Final products will consist of multiple grades of Ilmenite, zircon and rutile all of which will be sold to overseas markets. A computer-generated aerial image of the proposed operation is shown in Figure 2.

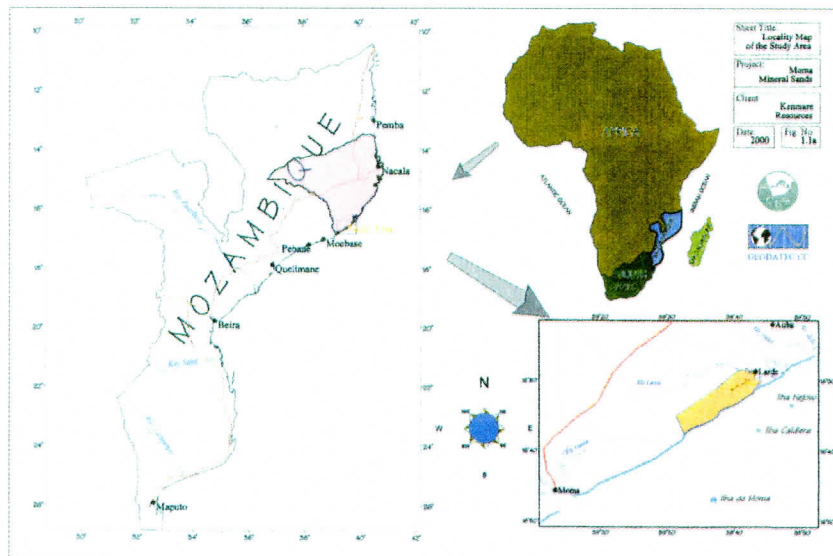


Figure 1: Location of the Kenmare Moma Mine in Nampula Province, Mozambique

The land surrounding the proposed mine is used for subsistence agriculture, mainly involving crops of cassava and beans. Local communities employ “slash and burn” approach to clearing land prior to planting and much of the land surrounding the land is therefore highly disturbed. There are, however, small patches of natural woodland and coastal forest in the area. Fishing and rearing of chickens and goats are used by many of the communities to supplement their food source. There is very little formal employment available within 200km of the mine.

The primary water supply for the local communities is in the form of shallow hand-dug wells or boreholes, although surface water features are used for bathing and washing clothes.

2. OVERVIEW OF THE PROPOSED OPERATION

The proposed mining operation at the Namalope Reserve will be a mineral sands mining project that extracts titanium minerals (ilmenite and rutile) and zircon using a dredge mining process to recover heavy minerals from dune sands. The mining process will use two cutter suction dredges that operate in a 400m wide by 700m long man-made mining pond with a minimum depth of 5.5m and a maximum depth of 15m. These dredges operate by cutting sand at the working face and transferring this sand by means of a suction pump and pipe to the concentrator floating behind the dredges (Figure 3 on next page).



Figure 2: Aerial image of the Kenmare Moma Mine

Prior to mining, vegetation will be cleared and topsoil removed to a depth of 200mm and then immediately transferred to the back of the mined out areas where it is used for rehabilitation. Long-term stock-piling of topsoil will be avoided to maximise the viability of the natural seed bank within the topsoil. The amount of clearing will be limited to no more than the area required for mining in the following year, although the actual area will vary from 0.5km² to 2.5km², depending on the thickness of the deposit in different areas.

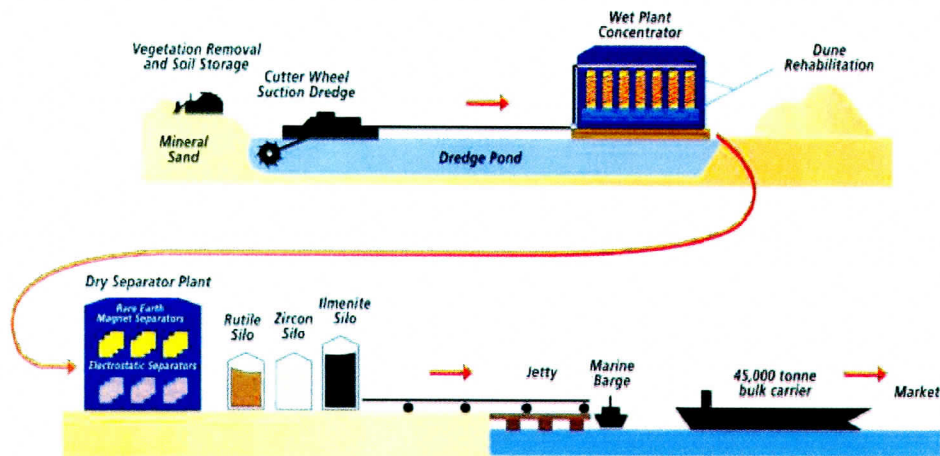


Figure 3: Schematic diagram of the Kenmare operation

As the mining face advances, the pond will be filled with tailings from the floating concentrator to a level at or slightly above the pre-existing land surface. Thereafter, the tailings will be contoured, and the top layer mixed with previously stored topsoil to produce a better water-retaining, fertile substrate for re-vegetation. Where required to meet the objectives of the Mine Rehabilitation Strategy, rehabilitation will be facilitated through addition of fertiliser and seeding with a variety of native species.

The proposed development will include an accommodation camp for 150 employees. All sewage will be treated on site and general (non-hazardous) waste will be buried in an on-site landfill. Hazardous waste will be transported by road to Maputo (~1500km away) for disposal in a hazardous waste landfill.

END OF EXAMINATION PAPER