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Ohorongo Mining (Pty) Ltd

Proposed Cement Manufacturing Plant and Quarry: Sargberg (Otavi/Tsumeb)

Environmental Impact Assessment and Management Plan

EXECUTIVE SUMMARY

1. INTRODUCTION

Ohorongo Mining (Pty) Ltd was previously called Ohorongo Cement (Pty) Ltd. This is a joint venture between a subsidiary of SCHWENK Zement KG in Germany and Namibian investors. The total investment is expected to be N$ 1.5 billion.

The project is motivated by the growing demand and shortage of cement in southern Africa and the lack of any cement plant in Namibia, despite the fact that the requisite natural resources are abundant here. Ohorongo Mining is the holder of EPL 3371, but only a small portion of this EPL is of interest, and is referred to as the "Study Area". Refer to **Figure 1** (p.5 of the main EIA report) and **Figure 2** (inside back cover).

Ohorongo Mining proposes to establish a quarry and cement plant on the farm Sargberg No. 585, which is about 17 km north of Otavi. The site is adjacent to the railway line to Walvis Bay and Ondangwa. Road access is from the B1 tar road. The economics of cement manufacture require that the manufacturing plant be adjacent to the major source of raw materials, namely limestone, shale and silica. **Photos 1-6** (inside back cover) show an overview of the area.

The major fuel source will be imported coal, but this may be supplemented with encroacher species of bush from nearby parts of Namibia.

A Scoping Report was prepared by Colin Christian & Associates cc (CCA, Nov 2007) as the first stage in this Environmental Impact Assessment. The Scoping Report should be regarded as integral to this EIA report. It deals with the Public Participation Programme and a number of preliminary consultations with specialists in various fields.

Some concerns were raised by the public, mainly based on experience of the old cement plant at Otjiwarongo which had a very poor environmental record, especially with respect to air quality. The issues raised by the public have been assessed at an appropriate level of detail in the EIA. There was considerable interest in the project, especially from the people of Otavi, where more than 200 people attended a public meeting.

The Scoping Report included a number of appendices, which are also of relevance to this EIA report, and which are listed on p.3 of the EIA report. Further specialist studies relevant to the EIA are contained in Appendices K - N to the EIA report.

2. THE PROJECT PROPOSAL

Quarry

The proposed quarry site has sufficient reserves of limestone, shale and silica for more than 100 years. Approximately 1.2 million tonnes of limestone and shale will be mined per annum. The likely extent of the quarry over 25 and 100 years respectively is shown in **Figures 2 & 5**.

Cement Manufacturing Plant

The manufacture of cement requires the following processes: -

Stage 1: Mining and crushing of limestone, and blending with other raw materials containing aluminium, iron and silica. The mixture is referred to as raw meal.

Stage 2: The raw meal is then preheated with exhaust gases from the kiln, then introduced to the kiln where it becomes a semi-smelted product at around 1,450°C. It is then fast cooled to

form clinker, which ranges from dust particles to golf ball size. The maximum clinker production will be about 640,000 t/annum.

Stage 3: Involves grinding of the clinker, and blending the powder with 5% gypsum. Other additives may also be used to provide the required properties of the cement. The maximum cement production would be about 650,000 t/annum

Stage 4: The final cement product is stored in silos, for bulk loading to trucks, or for supply to the bagging plant.

The power consumption will be about 15-17 MW. Approximately 80,000 tonnes of coal per annum will be used to fire the kilns. The coal will be imported via Walvis Bay harbour and railed to the plant. Groundwater will be supplied from four or five boreholes on the farm Sargberg, close to the site of the plant (refer to **Figures 2 & 4** inside back cover). Water consumption will up to 70,000 m^3/annum.

There is a possibility of using encroacher bush as a supplementary fuel source. This refers to indigenous woody plant species that have invaded former grasslands and savannas - resulting in substantial loss of grazing and revenue to farmers due to reduced carrying capacity of the veld. Harvesting such bush for fuel can have positive environmental and economic benefits to many people.

An access road will be built from the B1 tar road to the plant (approximately 10km), and likewise a power line (132kV) will be built on a similar route.

3. THE PROJECT ENVIRONMENT

Section 3 of the EIA provides a description of key aspects of the environment that are relevant to the potential impacts of the project, and constraints upon the project.

With regard to bio-physical aspects, the project location is within the Otavi Mountain Lands which are known to be somewhat sensitive, particular in regard to some vegetation communities and certain aquatic fauna in karst caves. These aspects were therefore considered in some detail. Fauna and birds were also considered and no major concerns were raised about the conservation status of any species being affected by the project.

Socio-economic conditions for most of the people in the area are generally poor and there is a considerable need for employment.

4. LEGAL & POLICY REQUIREMENTS

A specialist report was compiled at the scoping stage on the legal and policy requirements for a project of this nature. The report was contained as Appendix J to the Scoping Report.

5. ENVIRONMENTAL ASSESSMENT

A number of potential impacts were identified as a result of: -

- The public participation,
- An initial site investigation,

- Consultations with specialists,
- Professional experience, and the
- RSA DEAT 1992 Checklist of Environmental Characteristics.

Each of the potential impacts was assessed based on the following criteria: - the nature, extent, duration and intensity of the impact, and the probability that the impact may occur. The confidence that can be placed in the assessment, given the limitations on available information, was also rated. Potential mitigation (or enhancement) measures were recommended in each case. Recommendations were made for further investigation or monitoring during the relevant phase of the project. Finally a significance rating was given to each key issue or impact.

A “low” significance would mean that the impact should not influence a decision to approve the project - although mitigation measures may still be recommended to reduce negative impacts or enhance positive impacts. A “medium” significance would mean that a particular impact should affect a decision to approve the project unless the impact can be effectively mitigated. A “high” significance rating means that the identified impact should affect a decision to approve the project regardless any mitigation measures (or that there is no meaningful mitigation possible for a serious impact).

The table below provides a summary of the issues and impacts identified, the significance rating arising from the assessment, possible mitigation (or enhancement) measures, and recommendations for further investigation or monitoring at some stage of the project life cycle.

Environmental Impact or Issue	**Significance Rating**	**Possible Mitigation**	**Further Investigation or Monitoring Recommended**
Impact on rock and landscape – quarry	Low	Partial rehabilitation of quarry	Response to mining plan
Management of topsoil	Low	Removal and stockpiling of topsoil	“
Potential for sinkhole formation	Low	-	Deep drilling to warn of cavities, if any
Impacts of groundwater abstraction – local level	Medium	-	Regular hydrocensus
Cumulative impacts of groundwater abstraction – regional level (30km)	Low due to cement project alone	-	Monitoring of water levels in karst “wet caves”
Impacts on karst fauna in “wet caves”	Low due to cement project alone	-	Monitoring of water levels in karst “wet caves”
Potential for groundwater contamination	Low	Avoid dolomite and limestone substrates when siting activities that could pollute soil. Control all potential sources of pollution at source.	Periodic water quality tests
Solid & liquid fuels	Low	Compaction of soil, Bunding of liquid installations, Paving for woodchips	Site facilities on tillite or shales
Site camp	Low	Site selection, housekeeping, proper sanitation	Site selection to avoid sensitive areas
Waste disposal	Low	Use in kilns, recycling, or disposal at approved landfill	Monitor compliance with management plan
Impacts on natural vegetation	Medium	Avoid the Steep limestone hill habitat, Rescue geophytes from intermontane valley, Minor adjustments to access road route.	Environmentally sensitive mine planning, Monitor Ficus thonningii on Ma Foi.

Impacts of alien invasive plants	Medium	Monitoring and timeous eradication	Ongoing monitoring
Impacts of harvesting encroacher bush (benefits)	Highly positive	Seek business models to optimise total benefits and distribution of benefits	Establish economic constraints – threshold distances etc.
Impacts of harvesting encroacher bush (negatives)	Medium (negative)	Education and supervision, leaving strips to prevent erosion	Develop a generic EMP and apply as a condition of contract to Ohorongo
Impacts on indigenous fauna	Medium	Speed limits, road design, housekeeping, prevent access to artificial water sources	Recording of animal fatalities
Impacts on birds	Low	Avoid any raptor nests, and avoid large trees	Plan road alignment to avoid large tree clumps
Impacts of access road	Medium	Avoid large trees, Intersect B1 tar road safely, Discourage speeding.	Design stage Consult farm owners and Roads Authority
Impacts of power line	Low	Follow access road, 100m away from dwellings and work places, bird flappers if required	
New housing provision	-		Town planning
Impacts of noise - quarry	Low	Blast during daylight only Maintain vehicles	Design of crusher-housing
Impacts of noise - plant	Low	Design to meet SABS standards	
Impacts of noise – access road	Medium	Design alignment and tar surface, berms near dwellings, normally only 12 hr operation	
Impact of traffic on major roads	Medium to Low	Location of intersection, construct turning lanes, avoid overloading	Consult with Roads Authority
Impacts on air quality – quarry, crusher, tracks	Medium	Clearing & stockpiling of soil, Spraying with water, dust filters	
Impacts on air quality – manufacturing plant	Low	Apply modern technology as proposed	
Health and emergency services	Low	Planning of emergency procedures, training in first aid	
Occupational Health & Safety	-	Technological solutions to comply with dust and noise standards	
Impact of project on HIV/AIDS	Low	Staff education, voluntary testing	Ongoing awareness programme
Impact of HIV/AIDS on the project	Medium	As above, plus regular training to replace workers lost	
Economic benefits to Namibia	High (positive)	Enhance benefits through harvesting encroacher bush	
Potential synergy with Kavango Biofuel	-		Negotiations and feasibility study
Impacts on Namibia's power demand	Low (4.2%)	Design to minimise demand, Install solar water heating	
Impacts of unreliable power supply	Medium	-	
Potential security issues	Low	Establish access control points Conditions of employment	
Visual impacts and lighting	Low	Avoid lighting facades of buildings (except hazard lights for aircraft)	
Impacts on public perceptions	-	Good, regular information supply to the public.	

A qualitative assessment was also made in terms of the three criteria used in Environmental Economics (Stauth, 1983), namely *efficiency, equity* and *intergenerational equity.* These criteria are explained in Section 7.2 of the EIA.

The project is considered to be *efficient* in that it will bring a net benefit to Namibian society. It is considered to be *equitable* in that no group will be disadvantaged by the project, and many will benefit through employment and secondary economic benefits (multiplier effects).

The economic benefits can be greatly enhanced if encroacher bush is used as a supplementary fuel. This option would also enhance the distribution of benefits to a wider range of labourers, small businesses, farmers, transport operators and support industries.

The project satisfies the *intergenerational equity* criterion in that it will not disadvantage any future generations. The resources are sustainable, although groundwater will need to be carefully monitored. Cumulative impacts with other groundwater abstraction and climate change may pose a threat to unique aquatic fauna in karst caves in the medium to long term. Thus water levels in these caves some 19km away and more will need to be monitored by Water Affairs. This is the only potential biodiversity issue, but it does not arise from the cement project alone.

Namibia is expected to have a shortage of electricity for a few years to come, which may present a challenge for the developer.

6. ENVIRONMENTAL MANAGEMENT PLAN

Finally, Section 8 of the EIA report summarises the key management recommendations in the format of an Environmental Management Plan (EMP). The phase at which the recommendation is applicable is indicated for each management measure, namely: -

- Planning and design,
- Construction,
- Operations, and
- Closure & Post Closure phases.

7. CONCLUSION

It is concluded that the economic benefits of the project to Namibia should outweigh the limited negative impacts on the natural environment.

In addition, if the project exploits the opportunity for the use of encroacher bush as fuel, then the socio-economic benefits, and the distribution of benefits, should be greatly enhanced. At the same time controlled and well managed harvesting of encroacher bush should add environmental benefits for many farms that are producing livestock.