



global environmental solutions

Ohorongo Cement

Scoping Report (Including Impact Assessment) for the Proposed
Expansion to the Ohorongo Cement Operations

SLR Project No.: 734.15017.00001

Report No.: 1

December 2016



Ohorongo Cement

Scoping Report (Including Impact Assessment) for the Proposed
Expansion to the Ohorongo Cement Operations

SLR Project No.: 734.15017.00001

Report No.: 1

December 2016

Ohorongo Cement (Pty) Ltd

DOCUMENT INFORMATION

Title	Scoping Report (Including Impact Assessment) for the Proposed Expansion to the Ohorongongo Cement Operations
Project Manager	Werner Petrick
Project Manager e-mail	wpetrick@slrconsulting.com
Author	Fiona Bolton
Reviewer	Werner Petrick
Client	Ohorongongo Cement (Pty) Ltd
Date last printed	2016/12/01 08:23:00 AM
Date last saved	2016/12/01 08:23:00 AM
Comments	
Keywords	EIA, Scoping, Assessment, Amendment, Ohorongongo Cement, Otavi, Tsumeb
Project Number	734.15017.00001
Report Number	1
Status	Final – for MET review
Issue Date	December 2016

SLR CONTACT INFORMATION

SLR contact	Werner Petrick
Email	wpetrick@slrconsulting.com
Tel number	+264 64 402 317
Fax number	+264 64 403 327

SCOPING REPORT (INCLUDING IMPACT ASSESSMENT) FOR THE PROPOSED EXPANSION TO THE OHORONGO CEMENT OPERATIONS

CONTENTS

EXECUTIVE SUMMARY	I
1. INTRODUCTION	1-1
1.1 BACKGROUND.....	1-1
1.2 MOTIVATION FOR THE PROPOSED CHANGES TO THE OHORONGO OPERATION.....	1-5
1.3 INTRODUCTION TO THE ENVIRONMENTAL IMPACT ASSESSMENT	1-5
1.3.1 ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FOR THE PROPOSED EXPANSION TO THE OHORONGO OPERATION.....	1-5
1.3.2 EIA PROCESS.....	1-6
1.3.3 EIA TEAM	1-7
2. SCOPING METHODOLOGY	2-1
2.1 INFORMATION COLLECTION	2-1
2.2 SCOPING REPORT.....	2-1
2.3 PUBLIC PARTICIPATION PROCESS	2-2
2.3.1 INTERESTED AND AFFECTED PARTIES	2-3
2.3.2 STEPS IN THE PUBLIC CONSULTATION PROCESS	2-3
2.3.3 SUMMARY OF ISSUES RAISED	2-5
3. ENVIRONMENTAL LAWS AND POLICIES	3-1
3.1 SUMMARY OF APPLICABLE ACTS & POLICIES.....	3-1
3.2 CONVENTION ON BIOLOGICAL DIVERSITY	3-4
4. DESCRIPTION OF THE PROPOSED EXPANSION TO THE OHORONGO OPERATION	4-1
4.1 APPROVED FACILITIES AT THE OHORONGO OPERATION.....	4-1
4.2 PROPOSED EXPANSION TO THE OHORONGO OPERATION	4-2
4.2.1 MINING	4-3
4.2.2 CEMENT MANUFACTURING PROCESS	4-4
4.2.3 POWER SUPPLY	4-4
4.2.4 FUEL SUPPLY AND STORAGE	4-4
4.2.5 WATER REQUIREMENTS.....	4-4
4.2.6 TRANSPORT REQUIREMENTS.....	4-4
4.2.7 TIME TABLE	4-5
4.2.8 EMPLOYMENT.....	4-5
4.3 DECOMMISSIONING AND CLOSURE PHASE OF THE TWO NEW MINING AREAS	4-6
4.3.1 CLOSURE OBJECTIVES.....	4-6
4.3.2 DECOMMISSIONING ACTIVITIES	4-6
4.3.3 PIT AND QUARRY DECOMMISSIONING.....	4-6
4.3.4 MINERALISED WASTE FACILITIES	4-6
4.3.5 CLOSURE ACTIVITIES.....	4-6
5. DESCRIPTION OF THE CURRENT ENVIRONMENT.....	5-1
5.1 CLIMATE.....	5-1
5.1.1 TEMPERATURE	5-1
5.1.2 PRECIPITATION.....	5-1
5.1.3 HUMIDITY.....	5-2
5.1.4 SOLAR RADIATION.....	5-2
5.1.5 WINDS.....	5-2
5.2 TOPOGRAPHY AND DRAINAGE	5-2
5.3 GEOLOGY.....	5-2

5.4	HYDROGEOLOGY	5-2
5.5	SOILS	5-3
5.6	BIODIVERSITY	5-4
5.6.1	FLORA	5-4
5.6.2	FAUNA	5-5
5.7	AIR QUALITY	5-6
5.8	ARCHAEOLOGY	5-6
5.9	VISUAL	5-6
5.10	NOISE	5-7
5.11	SURROUNDING LAND USE AND CLOSEST SENSITIVE RECEPTORS	5-7
5.11.1	LAND USE	5-7
5.11.2	CLOSEST SENSITIVE RECEPTORS	5-7
6.	ALTERNATIVES	6-1
6.1	INFRASTRUCTURE LAYOUT	6-1
6.2	MANUFACTURING PROCESS	6-1
6.3	ALTERNATIVE TRANSPORT ROUTES AND MECHANISMS	6-2
6.4	THE “NO-GO” OPTION	6-3
7.	IDENTIFICATION AND DESCRIPTION OF POTENTIAL ENVIRONMENTAL IMPACTS	7-1
7.1	ASPECT AND IMPACT IDENTIFICATION	7-1
8.	ASSESSMENT OF RELEVANT ASPECTS & IMPACTS AND MANAGEMENT & MITIGATION MEASURES FOR ALL IDENTIFIED ASPECTS	8-1
8.1	BIODIVERSITY	8-3
8.1.1	ISSUE: PHYSICAL IMPACTS ON BIODIVERSITY	8-3
8.2	THIRD PARTIES’ (AND ANIMALS) SAFETY	8-5
8.2.1	ISSUE: DANGEROUS EXCAVATIONS	8-5
8.2.2	ISSUE: HAULING OF LIMESTONE NEAR HOUSES – 3 RD PARTIES’ SAFETY	8-7
8.3	SURFACE WATER	8-9
8.3.1	ISSUE: ALTERATION OF THE HYDROLOGICAL REGIME	8-9
8.4	AIR QUALITY	8-10
8.4.1	ISSUE: AIR POLLUTION	8-10
9.	WAY FORWARD	9-1
9.1	WAY FORWARD FOR THE SCOPING REPORT	9-1
10.	ENVIRONMENTAL IMPACT STATEMENT AND CONCLUSIONS	10-1
11.	REFERENCES	11-2

LIST OF FIGURES

FIGURE 1: REGIONAL SETTING OF THE OHORONGO OPERATION	1-3
FIGURE 2 – LOCAL SETTING OF THE OHORONGO OPERATION, ML 153 AND THE MINING LICENCE APPLICATION AREAS	1-4
FIGURE 3 – THE EIA PROCESS	1-7
FIGURE 4: CLOSEST SENSITIVE RECEPTORS	5-9
FIGURE 5: GEOLOGICALLY SUITABLE FOOTPRINT (RESOURCE) AREAS FOR THE SILICA SAND PIT AND LIMESTONE QUARRY	6-1

LIST OF TABLES

TABLE 1: EIA PROCESS	1-6
TABLE 2: THE ENVIRONMENTAL PROJECT TEAM	1-8
TABLE 3: SCOPING REPORT REQUIREMENTS STIPULATED IN THE EIA REGULATIONS.....	2-1
TABLE 4: SUMMARY OF INTERESTED AND AFFECTED PARTIES	2-3
TABLE 5: CONSULTATION PROCESS WITH IAPS AND AUTHORITIES	2-3
TABLE 6: RELEVANT LEGISLATION AND POLICIES FOR THE OHORONGO OPERATION	3-2
TABLE 7: SUMMARY OF THE PROPOSED EXPANSION AT THE OHORONGO OPERATION	4-2
TABLE 8: ESTIMATED NUMBER OF TRIPS PER DAY FOR EACH CAMPAIGN	4-5
TABLE 9: INTERNATIONAL AND NATIONAL CONSERVATION STATUS OF BIRD SPECIES	5-5
TABLE 10: ENVIRONMENTAL ASPECTS AND POTENTIAL IMPACTS ASSOCIATES WITH THE AMENDMENTS 7- 2	
TABLE 11: CRITERIA FOR ASSESSING IMPACTS	8-2

LIST OF APPENDICES

APPENDIX A: PROJECT TEAM CVS.....	A
APPENDIX B: INFORMATION SHARING RECORD.....	B
APPENDIX C: IAP DATABASE.....	C
APPENDIX D: ISSUES AN RESPONSE REPORT.....	D
APPENDIX E: BIODIVERSITY SPECIALIST STUDY	E
APPENDIX F: UPDATED EMP	F

ACRONYMS AND ABBREVIATIONS

Below a list of acronyms and abbreviations used in this report.

Acronyms / Abbreviations	Definition
BID	Background Information Document
DEA	Department of Environmental Affairs
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
EPL	Exclusive Prospecting Licence
IAP	Interested and Affected Party
km ²	Square kilometres
m	Metre
m ²	Square metres
ML	Mining License
MAWF	Ministry of Agriculture, Water and Forestry
MET	Ministry of Environment and Tourism
MME	Ministry of Mines and Energy
OML	Otavi Mountain Lands

EXECUTIVE SUMMARY

1. General introduction

This report is a Scoping Report (including impact assessment) for the proposed expansion of the mining activities associated with the approved Ohorongo Cement Factory and quarry located between Otavi and Tsumeb. Ohorongo Cement (Pty) Ltd (Ohorongo Cement) owns and operates the existing Ohorongo Cement Factory and quarry. The existing operation is located approximately 18 km north-east of Otavi and 39 km south-west of Tsumeb, 10 km west of the B1 National Road, in the Otjozondjupa Region, north-central Namibia. The project site is centred on the farms Ma Foi 784 and Hannover 549. Ma Foi 784 is owned by Schwenk Namibia Pty Ltd, while Hannover 549 is owned by the State (care of the Ministry of Lands and Resettlement). Refer to Figure 1 of the Scoping Report for the regional setting of the Ohorongo Operation.

The Ministry of Environment and Tourism (MET) issued an Environmental Clearance Certificate (ECC) in 2008 after an environmental impact assessment (EIA) was conducted (between 2007 and 2008) for the Ohorongo Operation. A Mining Licence (ML 153) was subsequently issued by the Ministry of Mines and Energy. Furthermore, Ohorongo Cement holds two Exclusive Prospecting Licences (EPLs), namely EPL No. 3371 and EPL No. 5166 located over the neighbouring farms Ma Foi 784 and Hannover 549. The above mentioned ECC was renewed by MET in March 2013 and Ohorongo Cement submitted another renewal application to MET earlier in 2016.

The approved Ohorongo operation includes a quarry (consisting of three open pits) for the mining of limestone, marl and shale, as well as a cement manufacturing plant and other ancillary infrastructure including an access road, powerline and boreholes. The 2008 Environmental Impact Assessment (EIA) (and Environmental Clearance Certificate) included all of these facilities and associated activities and the potential impacts relating to them.

After Ministry of Environment and Tourism (MET) and Ministry of Mines and Energy (MME) approval of the original Ohorongo Operation (2008 EIA), Ohorongo Cement continued resource investigation on the neighbouring farms Ma Foi 784 and Hannover 549 (EPL No 3371 and EPL 5166). During this exploration phase, Ohorongo Cement discovered additional mineral resources required as part of the cement manufacturing process, namely Special Silica Sand and Special Grade Limestone.

It is proposed to use the additional special raw materials (i.e. Special Grade Limestone and Special Silica Sand) for the cement production process. These raw materials are present within the EPL sites. Ohorongo Cement is applying to the Ministry of Mines and Energy (MME) for a new Mining Licence covering sections of both EPLs to access the raw materials from a proposed new pit (special grade silica sand) and quarry (special grade limestone). Refer to Figure 2 for the local setting including the Ohorongo Operations, ML 153 and the Mining Licence application areas.

The main purpose of this report is to provide information relating to the proposed expansion to the Ohorongo Operation and to indicate which environmental aspects and potential impacts have been identified during the Screening and Scoping phases. Existing information from the 2008 EIA was also used in this report and is further augmented by additional site observations, specialist assessments and the results of recent stakeholder consultation. The potential impacts of the proposed pit and quarry could therefore be assessed, and the assessment is also included in this report. The potential impacts were cumulatively assessed, taking into consideration the existing environment and all other (previously assessed and approved) activities and facilities related to the Ohorongo Operation.

This report, together with the updated Ohorongo EMP, should therefore provide sufficient information for MET to make an informed decision regarding the proposed expansion to the Ohorongo Operation and whether an environmental clearance certificate can be issued or not.

It should be noted that this environmental process is running in parallel with another proposed project at the Ohorongo Cement Factory. SunEQ GmbH is proposing to construct and operate a photovoltaic (PV) power plant with a capacity of up to ten (10) megawatt (MW_{AC}) at the Ohorongo Cement Factory. The electricity generated from the solar PV power plant would be used at the Ohorongo Cement Factory. The proposed site is located adjacent to the existing cement factory.

As both of the proposed projects are related to the Ohorongo Cement site, the environmental assessment process will be combined where possible. In this regard, one public consultation process was conducted to limit stakeholder fatigue and to avoid potential confusion. However, a separate set of EIA related reports has been produced to support each application. Stakeholders will have the opportunity to review the documents for both of the proposed projects.

2. Motivation for the proposed expansion to the Ohorongo Operation

After Ministry of Environment and Tourism (MET) and Ministry of Mines and Energy (MME) approval of the original Ohorongo Operation (2008 EIA), Ohorongo Cement continued resource investigation on the neighbouring farms Ma Foi 784 and Hannover 549 (EPL No 3371 and EPL 5166). During this exploration phase, Ohorongo Cement discovered additional mineral resources required as part of the cement manufacturing process, namely Special Silica Sand and Special Grade Limestone.

The inclusion of these additional raw materials into the cement manufacturing process will not increase the life of the existing Ohorongo Operation, which is estimated to be at least 100 years.

3. Description of the proposed expansion to the Ohorongo Operation

The table below summarises the proposed expansion related activities at the Ohorongo Operation. (Refer to Figure 2).

TABLE 2: SUMMARY OF THE PROPOSED EXPANSION AT THE OHORONGO OPERATION

Relevant project component	Description of proposed expansion to operations
Mining plan	<p><u>Special Limestone Quarry</u></p> <p>The new quarry will be located on the farm Hannover 549, west of the existing Ohorongo Operation. The new quarry will cover an area of approximately 2 hectares for a period of 25 years and will have the following approximate dimensions:</p> <ul style="list-style-type: none"> • Length x width: 150 x 150 m • Depth: 10 m <p>Due to the limited demand for these raw materials, it is expected that mining operations will be carried out in campaigns rather than continuous operation. It is expected that the total demand of Special Grade Limestone of 1,000 tonnes per year will be extracted in one single campaign of approximately 1 – 2 weeks per year.</p>
	<p><u>Special Silica Sand</u></p> <p>The proposed sand pit will be located on the farm Ma Foi 784, south east of the existing Ohorongo Operation. The proposed pit will cover an area of approximately 4 hectares for a period of 25 years and will have the following approximate dimensions:</p> <ul style="list-style-type: none"> • Length x width: 260 x 150 m • Depth: 10 m <p>Due to the limited demand for these raw materials, it is expected that mining operations will be carried out in campaigns rather than continuous operation. It is expected that the total demand of Special Silica Sand of 5,000 tonnes per year will be extracted in five to ten campaigns per year. Each campaign is expected to be 1 – 2 weeks in duration.</p>

Due to the nature of the proposed project, i.e. small scale open pit mining with limited support infrastructure, there will be no construction phase. Therefore, the description and assessment of the construction activities, as detailed in the 2008 EIA, will not be repeated in this report.

4. Identification of environmental aspects

As described above, there will be no construction phase associated with the proposed expansion project. The potential impacts associated with the construction facilities, activities and other construction related issues, as described and assessed in the 2008 EIA therefore remain relevant and will not be revisited or re-assessed.

The following issues were assessed in more detail and potential cumulative impacts associated with these issues re-assessed in this process and the findings presented in the Scoping Report:

- Physical impacts on biodiversity;
- Dangerous excavations;

- Air quality impacts (i.e. dust);
- Alteration in the hydrological regime.

5. Environmental impact assessment findings

5.1 Physical impacts on biodiversity

The clearing of a total of 6 ha (4 ha for the proposed silica sand pit and 2 ha for the proposed limestone quarry) as well as other project related activities will result in the following impacts:

- Loss of habitats;
- Loss of shelter for smaller vertebrates, especially reptiles;
- Direct impacts to birds through removal of nest sites in plants and on the ground;
- Destruction of plants, including some of conservation concern;
- Animal mortality resulting from vehicles and machinery strikes as well as through clearing of land (i.e. slow moving animals and dormant invertebrates);
- Vehicle tracks damage the soil and inhibit root growth.

With the implementation of mitigation measures, most of these impacts can be managed to acceptable levels.

The assessment found the significance of this potential impact to be high in the unmitigated scenario and low in the mitigated scenario.

5.2 Dangerous excavations

Dangerous excavations and infrastructure include all structures into or off which third parties and animals can fall and be harmed. Dangerous excavations related to the proposed expansion project include the pit and quarry. This infrastructure presents a potential risk of injury and/or death to both animals and third parties. With the implementation of mitigation measures (such as access control) the risk can be significantly reduced.

The assessment found the significance of this potential impact to be high in the unmitigated scenario and medium in the mitigated scenario.

5.3 Hauling of limestone near houses – third parties' safety

In the unmitigated scenario, the movement of the haul trucks, right next to a household with children presents a potential risk of injury and/or death to third parties. With the implementation of mitigation measures, such as either using an alternate haul road or relocating the people, the significance on this impact can be reduced to acceptable levels.

The assessment found the significance of this potential impact to be high in the unmitigated scenario and medium in the mitigated scenario.

In the mitigated scenario the severity reduces to low as an alternative route will be followed (or the relocation of third parties), to prevent impacts.

5.4 Alteration of hydrological regime

There is little distinct runoff in the area of the proposed silica sand pit, with few defined channels for flow and very shallow relief, resulting in most rainfall which falls either infiltrating, or becoming overland flow. The proposed limestone quarry is located at the foothills of a ridge (refer to Figure 2). There is a noticeable drainage line flowing from the ridge, past the proposed limestone quarry, where water would flow during rainfall events. Due to the limited footprint of the proposed pit and quarry, the related area for runoff generation is small. As such, any reduction in runoff caused by this infrastructure will have a minor effect on downstream conditions (if at all).

With the implementation of clean and dirty water separation measures the reduction in downstream flow will be further reduced as clean water will be diverted around the operational area and allowed to flow downstream. Flood protection measures at the limestone quarry will reduce the potential for further impacts.

The assessment found the significance of this potential impact to be medium in the unmitigated scenario and low in the mitigated scenario. The proposed expansion project will have no change to the previously identified impact assessment significance rating.

5.5 Increase in dust levels

The main source of nuisance dust associated with the proposed expansion is the access / haul road for the limestone quarry. While the quarry will not be mined on a continuous basis (mining activities are expected to occur for 1-2 weeks a year), the impact during this time will be very high to those people living alongside this road (refer to Figure 4). The implementation of mitigation measures (i.e. where the receptors have been relocated out with the impact zone) will greatly reduce the significance of this impact. It is acknowledged that the mining operations will create an increase in dust levels, however as there are no receptors in close proximity to the proposed pit and quarry there will be no impact.

The assessment found the significance of this potential impact to be medium-high in the unmitigated scenario and low in the mitigated scenario. The proposed expansion project will have no change to the previously identified impact assessment significance rating.

6. Way forward

The way forward is as follows:

- MET review the Scoping Report and EMP and provide record of decision.

SCOPING REPORT (INCLUDING IMPACT ASSESSMENT) FOR THE PROPOSED EXPANSION TO THE OHORONGO CEMENT OPERATIONS

1. INTRODUCTION

1.1 BACKGROUND

On 26 March 2008, Ohorongo Mining (Pty) Ltd (Ohorongo Mining) received an Environmental Clearance Certificate (ECC) from the Ministry of Environment and Tourism (MET) after an environmental impact assessment (EIA) was conducted for the Ohorongo Manufacturing Plant and Quarry (CCA, 2008). Ohorongo Cement operates the existing quarry sites under their Mining Licence area (ML 153) that was issued by the Ministry of Mines and Energy (MME), subsequent to the above mentioned environmental clearance. In September 2008, Ohorongo Mining changed their name to Ohorongo Cement (Pty) Ltd (Ohorongo Cement). The above mentioned ECC was renewed by MET in March 2013 and Ohorongo Cement submitted another renewal application to MET earlier in 2016.

The existing Ohorongo Manufacturing Plant and Quarry (Ohorongo Operation) is located approximately 18 km north-east of Otavi and 39 km south-west of Tsumeb, 10 km west of the B1 National Road, in the Otjozondjupa Region, north-central Namibia. The Ohorongo Operation is located 340 kilometres north of Windhoek on the farm Sargberg 585, which is owned by the State (care of Ministry of Lands and Resettlement). Refer to Figure 1 for the regional setting.

The approved Ohorongo operation includes quarries for the mining of limestone, marl and shale, as well as a cement manufacturing plant and other ancillary infrastructure including an access road, powerline and boreholes. The 2008 Environmental Impact Assessment (EIA) described and assessed all of these facilities and associated activities and the potential impacts relating to them.

Ohorongo Cement also holds two Exclusive Prospecting Licences (EPLs), namely EPL 3371 and EPL 5166, which surrounds ML 153. (Refer to Figure 1).

It is proposed to use additional special raw materials (i.e. Special Grade Limestone and Special Silica Sand) for the cement production process. This proposed expansion to Ohorongo Cement's existing operations will allow them to improve the quality of their product. It is therefore not aimed at increasing the cement manufacturing throughput.

These raw materials are present within the EPL sites located on Ohorongo Cement's neighbouring farms Ma Foi 784 and Hannover 549. Ohorongo Cement is applying to the Ministry of Mines and Energy (MME) for a new Mining Licence covering sections of both EPLs to access the raw materials from a proposed new pit and quarry. Refer to Figure 2 for the local setting including the Ohorongo Cement Operations, ML 153 and the proposed new Mining Licence area.

Prior to the development of the proposed expansion project, environmental clearance is required from the Ministry of Environment and Tourism (MET): Department Environmental Affairs (DEA) on the basis of an approved EIA amendment process, in terms of the Environmental Management Act, 2007 (No. 7 of 2007). In order for MET to consider an application for an ECC amendment an Environmental Impact Assessment (EIA) process must be undertaken in terms of the EIA Regulations (GN No. 30).

SLR Environmental Consulting (Namibia) (Pty) Limited (SLR), an independent firm of environmental consultants based in Namibia, has been appointed by Ohorongo Cement to undertake and manage the EIA process.

It should be noted that the EIA process for the above-mentioned expansion project is running in parallel with another proposed project at the Ohorongo Cement Factory. SunEQ GmbH is proposing to construct and operate a photovoltaic (PV) power plant with a capacity of up to ten (10) megawatt (MW_{AC}) at the Ohorongo Cement Factory. The electricity generated from the solar PV power plant would be used at the Ohorongo Cement Factory. The proposed site is located adjacent to the existing cement factory.

As both of the proposed projects are related to the Ohorongo Cement site, the environmental assessment process will be combined where possible. In this regard, one public consultation process was conducted to limit stakeholder fatigue and to avoid potential confusion. However, a separate set of EIA related reports has been produced to support each application. Stakeholders will have the opportunity to review the documents for both of the proposed projects.

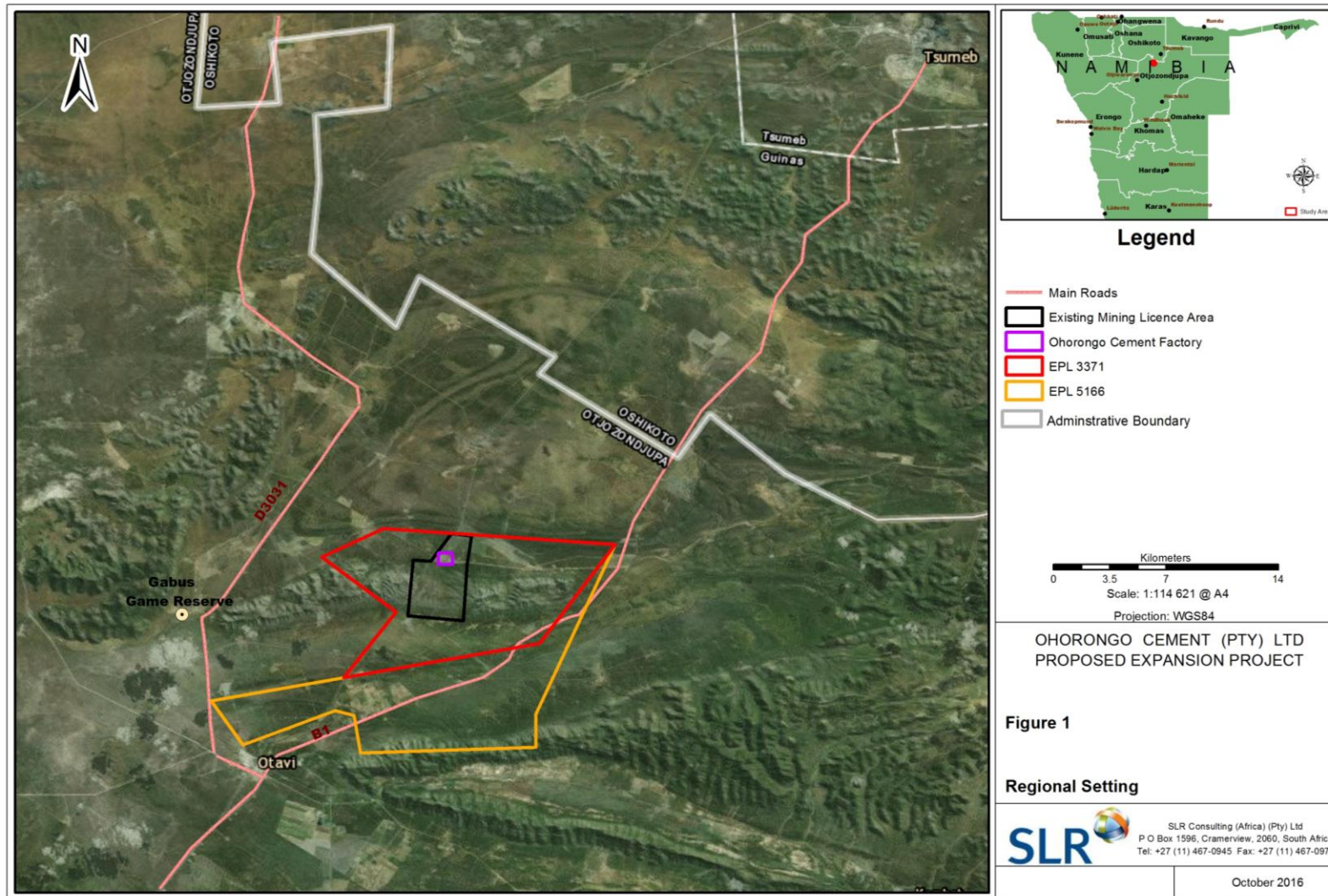


FIGURE 1: REGIONAL SETTING OF THE OHORONGO OPERATION

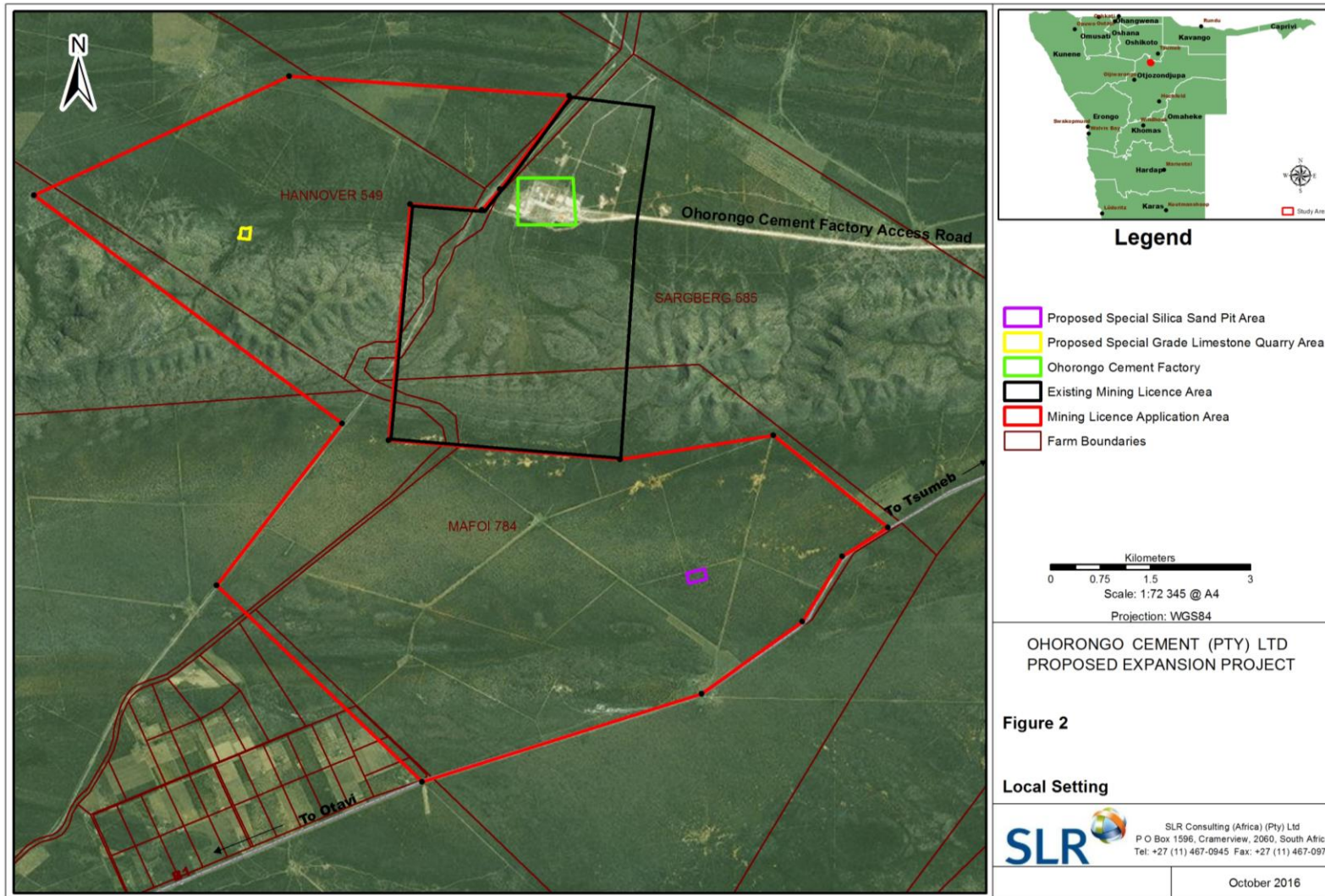


FIGURE 2 – LOCAL SETTING OF THE OHORONGO OPERATION, ML 153 AND THE MINING LICENCE APPLICATION AREAS

The environmental baseline and potential impacts associated with the Ohorongo operation have therefore already been determined and evaluated through the above mentioned (“original”) EIA process. This “original” EIA process was conducted between 2007 and 2008, which included a scoping phase and an assessment of impacts, the development of an EIA Report and an Environmental Management Plan (EMP) (CCA, 2008).

This document (the “Scoping Report (Including Impact Assessment) for the Proposed Expansion to the Ohorongo Cement Operations”) utilises the existing information from the approved EIA report, augmented by additional specialist studies and input from the stakeholder consultation process.

1.2 MOTIVATION FOR THE PROPOSED CHANGES TO THE OHORONGO OPERATION

After Ministry of Environment and Tourism (MET) and Ministry of Mines and Energy (MME) approval of the original Ohorongo Operation, Ohorongo Cement continued resource investigation on the neighbouring farms Ma Foi 784 and Hannover 549, within their EPL 3371 and EPL 5166. During this exploration phase, Ohorongo Cement discovered additional mineral resources, namely Special Silica Sand and Special Grade Limestone. These additional mineral resources are required to improve the quality of the cement product.

The inclusion of these additional raw materials into the cement manufacturing process will not increase the life of the existing Ohorongo Operation, which is estimated to be at least 100 years. It will also not increase the current production rate. The Special Silica Sand and Special Grade Limestone will improve the quality control process and will be used as correction materials.

1.3 INTRODUCTION TO THE ENVIRONMENTAL IMPACT ASSESSMENT

Environmental Impact Assessments are regulated by the Ministry of Environment and Tourism (MET) in terms of the Environmental Management Act, 7 of 2007. This Act was gazetted on 27 December 2007 (Government Gazette No. 3966) and enacted on 6 February 2012. The Environmental Impact Assessment Regulations: Environmental Management Act, 2007 (Government Gazette No. 4878) were promulgated on 6 February 2012.

1.3.1 ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FOR THE PROPOSED EXPANSION TO THE OHORONGO OPERATION

Prior to the development of the proposed new sand pit and limestone quarry (and associated ancillary infrastructure), environmental clearance is required from the Ministry of Environment and Tourism (MET): Department Environmental Affairs (DEA) on the basis of an approved EIA amendment process.

This EIA process is conducted in terms of the Environmental Management Act, 7 of 2007 and the above mentioned EIA regulations. This process includes: a screening phase and a scoping phase, which will

include an impact assessment and an amended Environmental Management Plan (EMP) for the Ohorongo Operation.

This report is the Scoping Report, with assessment included. The main purpose of this report is to provide information relating to the proposed expansion to the Ohorongo Operation and to indicate which environmental aspects and potential impacts have been identified during the Screening and Scoping phases. Existing information from the 2008 EIA (CCA, 2008) was also used in this report and is further augmented by additional site observations, specialist assessments and the results of recent stakeholder consultation. The potential impacts of the new pit and quarry (and associated ancillary infrastructure) could therefore be assessed, and the assessment is also included in this report. The potential impacts were cumulatively assessed, taking the existing environment and all other (previously assessed and approved) activities and facilities associated with the Ohorongo Operation into consideration.

It is thought that this Scoping Report (including an assessment of impacts), together with the attached revised EMP, will provide sufficient information for the MET to make an informed decision regarding the proposed project, and whether an environmental clearance certificate can be issued or not.

The additional/updated specialist studies that were conducted include a biodiversity assessment.

1.3.2 EIA PROCESS

The EIA Scoping process and corresponding activities are outlined in Table 1 below.

TABLE 1: EIA PROCESS

Objectives	Corresponding activities
Project initiation/screening phase (September – October 2016)	
<ul style="list-style-type: none"> Identify environmental aspects and potential impacts internally Notify the decision making authority of the proposed project and process Initiate the EIA Scoping process. 	<ul style="list-style-type: none"> Project initiation meetings and site visits. SLR conducted a site visits to familiarise themselves with the proposed expansion to the Ohorongo Operation and to inspect the existing environment where this will occur. Identify environmental and social issues, taking the 2008 EIA into consideration. Determine further legal requirements. Notify MET (DEA) of the proposed PV power plant project and the EIA process through telephonic discussion and a background information document.
Scoping phase (including assessment of impacts) (October – December 2016)	
<ul style="list-style-type: none"> Review and update the existing Ohorongo Operation interested and/or affected parties (IAPs) database and involve IAPs in the scoping process through information sharing. Further identify potential environmental issues associated with the proposed expansion. Consider alternatives. Provide a detailed description of the potentially affected environment. 	<ul style="list-style-type: none"> Notify government authorities of the project and EIA process (telephone calls, e-mails, distribution of background information documents, newspaper advertisements and site notices). Refer to Appendix B. Submit Application for Amendment to MET. Interested and affected party (IAP) registration and comments. Public and Focus Group meetings. Conduct specialist studies (including site visits by relevant specialists). Compilation of Scoping Report (including assessment of

Objectives	Corresponding activities
<ul style="list-style-type: none"> Assessment of potential environmental impacts associated with the proposed new pit and quarry (and associated ancillary infrastructure) as well as the potential cumulative impacts for the wider Ohorongo Operation. Develop management and mitigation measures. 	<ul style="list-style-type: none"> impacts) and revise the existing Ohorongo EMP. Distribute Scoping Report and EMP to relevant authorities and IAPs for review. Forward finalised Scoping Report with EMP and IAPs comments to MET for decision making.

The above mentioned EIA process is explained diagrammatically in Figure 3 below.

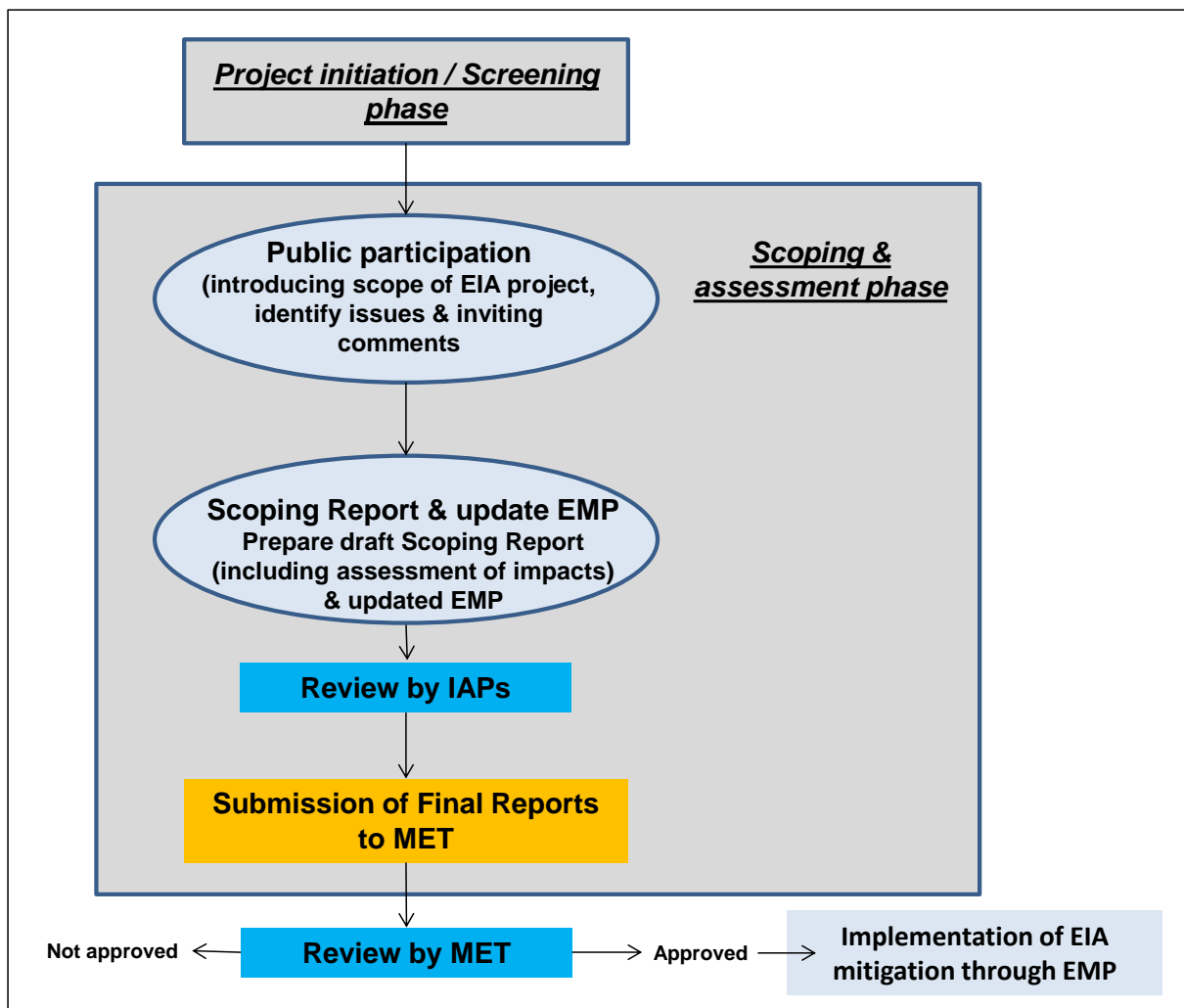


FIGURE 3 – THE EIA PROCESS

1.3.3 EIA TEAM

SLR Environmental Consulting (Namibia) (Pty) Ltd (SLR) is the independent firm of consultants appointed by Ohorongo Cement to undertake the EIA. Werner Petrick, the EIA project manager has approximately seventeen years of relevant experience in conducting/managing EIAs, compiling EMPs

and implementing EMPs and Environmental Management Systems. Werner is certified as lead environmental practitioner and reviewer under the Environmental Assessment Professionals Association of Namibia (EAPAN). Marvin Sanzila, the EIA Project Assistant has six years of experience in the environmental management discipline with four years' experience in the mining industry dealing with environmental management systems implementation (ISO14001), coordination and implementation of EMPs, legal compliance and two year with EIAs. Fiona Bolton, the project assistant, holds an Honours degree in Environmental Science and has ten years of relevant experience. The relevant curriculum vitae documentation is attached in Appendix A. The environmental project team for the proposed expansion to the Ohorongo Operation is outlined in Table 2 below.

TABLE 2: THE ENVIRONMENTAL PROJECT TEAM

Team	Name	Designation	Tasks and roles	Company
Ohorongo Project Team	Manfred Pirker	Plant Manager	Responsible for the implementation of the EIA outcomes.	Ohorongo Cement (Pty) Ltd
	Junge Jansen	SHE Coordinator		
	Dr. Markus Schauer	Head of Geology and Environment from Schwenk Zement KG		
Project management	Werner Petrick	Project Manager	Management of the process, team members and other stakeholders. Report and process review	SLR
	Fiona Bolton	Project Assistant	Report compilation	
	Marvin Sanzila	Project Assistant	Project administration/assistant	
Specialist investigations	Hoens Potgieter	Biodiversity	Biodiversity assessment	African Wilderness Restoration

2. SCOPING METHODOLOGY

2.1 INFORMATION COLLECTION

SLR used various sources to identify both the environmental issues associated with the proposed expansion to the Ohorongo Operation and the terms of reference for specialist investigations. The main sources of information for the preparation of the Scoping Report include:

- Relevant information relating to the new pit and quarry (and associated ancillary infrastructure), provided by Ohorongo Cement;
- Site visits by SLR;
- Consultation with the technical project team;
- Consultation with and input from specialists;
- Consultation with IAPs/stakeholders; and
- Consultation with relevant authorities.

Extensive use was made of Ohorongo Cement's approved EIA and EMP Report (CCA, 2008).

2.2 SCOPING REPORT

The main purpose of this Scoping Report is to indicate which environmental aspects relating to the proposed expansion of the Ohorongo Operation might have an impact on the environment. Due to reasons mentioned in Section 1.3.1, these potential impacts could also be assessed and the findings presented in this report. Table 3 outlines the Scoping Report requirements contained in Section 8 of the Environmental Impact Assessment Regulations promulgated in February 2012 under the Environmental Management Act, 7 of 2007. The table includes reference to the relevant sections in the report.

TABLE 3: SCOPING REPORT REQUIREMENTS STIPULATED IN THE EIA REGULATIONS

REQUIREMENTS FOR A SCOPING REPORT IN TERMS OF THE FEBRUARY 2012 REGULATIONS	REFERENCE IN REPORT
(a) the curriculum vitae of the EAP who prepared the report;	Appendix A
(b) a description of the proposed activity;	Section 4
(c) a description of the site on which the activity is to be undertaken and the location of the activity on the site	Section 4 and Section 5
(d) a description of the environment that may be affected by the proposed activity and the manner in which the geographical, physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed listed activity	Sections 5, 7 and 8
(e) an identification of laws and guidelines that have been considered in the preparation of the Scoping Report;	Section 3.
(f) details of the public consultation process conducted in terms of regulation 7(1) in connection with the application, including - (i) the steps that were taken to notify potentially interested and affected parties of the	Sections 1.3.2 and 2.3 and Appendix B

REQUIREMENTS FOR A SCOPING REPORT IN TERMS OF THE FEBRUARY 2012 REGULATIONS	REFERENCE IN REPORT
proposed application; (ii) proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the proposed application have been displayed, placed or given; (iii) a list of all persons, organisations and organs of state that were registered in terms of regulation 22 as interested and affected parties in relation to the application; and (iv) a summary of the issues raised by interested and affected parties, the date of receipt of and the response of the EAP to those issues;	
(g) a description of the need and desirability of the proposed listed activity and any identified alternatives to the proposed activity that are feasible and reasonable, including the advantages and disadvantages that the proposed activity or alternatives have on the environment and on the community that may be affected by the activity;	Sections 1.2 and 6
(h) a description and assessment of the significance of any significant effects, including cumulative effects, that may occur as a result of the undertaking of the activity or identified alternatives or as a result of any construction, erection or decommissioning associated with the undertaking of the proposed listed activity;	Sections 7 and 8
(i) terms of reference for the detailed assessment; and	Section 7
(j) an environmental management plan, which includes - (i) information on any proposed management, mitigation, protection or remedial measures to be undertaken to address the effects on the environment that have been identified including objectives in respect of the rehabilitation of the environment and closure; (ii) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of the activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and (iii) a description of the manner in which the applicant intends to modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation remedy the cause of pollution or degradation and migration of pollutants.	Section 8 and Appendix F

2.3 PUBLIC PARTICIPATION PROCESS

The public participation process for the expansion to the Ohorongo Operation was aimed at ensuring that all persons and/or organisations that may be affected by, or interested in, the proposed expansion were informed of the project and could register their views and concerns. By consulting with relevant authorities and IAPs, the range of environmental issues to be considered in the Scoping Report (including the assessment of impacts) has been given specific context and focus.

Included below is a summary of the people consulted, the process that was followed, and the issues that were identified.

2.3.1 INTERESTED AND AFFECTED PARTIES

The following table (Table 4) provides a broad list of stakeholders that are relevant to the Ohorongo Operation and the proposed expansion. They were informed about the need for the proposed expansion and the EIA process, including the public consultation, being conducted.

TABLE 4: SUMMARY OF INTERESTED AND AFFECTED PARTIES

Local and regional government – councillors and key officers	Ministries and parastatals – key officers	Special interest groups	Other IAPs
Otjozondjupa Regional Council	Ministry of Environment and Tourism	Neighbouring farm owners / users and Tourism Lodges	Mining / Industrial companies
Otavi Municipality	Ministry of Mines and Energy	Other groups of individuals that shown an interest in the proposed project	Chamber of Mines
Tsumeb Municipality	Ministry of Agriculture, Water and Forestry	National Chamber of Commerce and Industry	Environmental NGOs e.g. Earthlife Namibia
	Ministry of Urban and Rural development		Individual specialists
	National Heritage Council		Press / Media
	Ministry of Works, Transport and Communication		
	Roads Authority		
	Ministry of Lands and resettlement		
	NamPower		

The full stakeholder database for this project is included in Appendix C of this report.

2.3.2 STEPS IN THE PUBLIC CONSULTATION PROCESS

Table 5 sets out the steps that were followed as part of the consultation process:

TABLE 5: CONSULTATION PROCESS WITH IAPS AND AUTHORITIES

TASK	DESCRIPTION	DATE
Notification - regulatory authorities and IAPs		
Notification to MET	SLR notified MET of the proposed project through a background information document (BID). Subsequently, SLR had a telephonic discussion with MET:DEA regarding the proposed PV power project and the EIA being followed. MET agreed to the EIA process.	September & October 2016
IAP identification	The Ohorongo Cement stakeholder database was used. This database is updated as and when required. A copy of the IAP database is attached in Appendix C.	September - October 2016 and throughout the process

TASK	DESCRIPTION	DATE
Distribution of background information document (BID)	<p>BIDs were distributed via email to relevant authorities and IAPs on the IAP stakeholder database and hard copies were made available on request.</p> <p>Hard copies of the BID were also made available at the Otavi and Tsumeb Municipalities and were further distributed during the Scoping Focus Group meetings and (open) public meetings.</p> <p>The purpose of the BID was to inform IAPs and authorities about the proposed expansion to the Ohorongo Operation, the assessment process being followed, possible environmental impacts and ways in which IAPs could provide input to SLR. Attached to the BID was a registration and response form, which provided IAPs with an opportunity to submit their names, contact details and comments on the project.</p> <p>A copy of the BID is attached in Appendix B.</p>	September 2016
Site notices	<p>Site notices were placed at the Otavi and Tsumeb Municipalities to notify IAPs of the proposed project, the EIA amendment process being following and the public meetings. The site notice that were displayed are attached in Appendix B.</p> <p>Furthermore, site notice were placed at relevant locations to inform IAPs of the availability of the Scoping Report for review.</p>	September 2016 November 2016
Newspaper Advertisements	<p>Block advertisements were placed as follows:</p> <ul style="list-style-type: none"> • The Namibian (27 September and 4 October 2016) • The Republikein (27 September and 4 October 2016) <p>Copies of the advertisements are attached in Appendix B.</p>	September 2016
Public and Focus Group Meetings and submission of comments		
Public meetings	<p>Two public meetings were held as follows:</p> <ul style="list-style-type: none"> • Otavi Town Hall • Makalani Hotel, Tsumeb <p>Similar project information was presented/shared at all the meetings and discussions. A copy of the slides that were presented at these meetings is included in Appendix B.</p>	6 October 2016
Focus group meetings	<p>Two focus group meeting were held with key stakeholders and affected parties as follows:</p> <ul style="list-style-type: none"> • Otavi Municipality • Neighboring farmers and people living within the proposed site boundary; • Ministry of Lands and Resettlement <p>Similar project information was presented/shared at all the meetings and discussions. A copy of the slides that were presented at these meetings is included in Appendix B.</p>	6 and 7 October 2016
Comments and Responses	<p>Minutes of the meetings and all comments received during the meetings and by email are attached in Appendix B. A Summary Issues and Response Report is attached in Appendix D.</p>	September - October 2016
Review of draft Scoping Report		
IAPs and authorities (excluding MET) review of Scoping Report and EMP	<p>Copies of the Scoping Report (including impact assessment) and the EMP were made available for review at the following places:</p> <ul style="list-style-type: none"> • Otavi Municipality • Tsumeb Municipality 	October – November 2016

TASK	DESCRIPTION	DATE
	<ul style="list-style-type: none"> • National Library of Namibia in Windhoek. <p>Electronic copies of the report were available on request to SLR (on a CD).</p> <p>Summaries of the Scoping Report were distributed to all relevant authorities and IAPs (with e-mail addresses) that are registered on the IAP database via e-mail. Stakeholders without e-mail addresses that are registered on the project, were notified of the availability of the scoping report through 'bulk SMSs (14 November). Site notices were also put up in Otavi (i.e. Otavi Municipality and the Spar) and Tsumeb (Tsumeb Municipality, Spar and Pupkewitz). Proof of the notification of the availability of the report for review via e-mail, site notices and SMS are attached in Appendix B.</p> <p>Electronic copies of the report were also sent to the relevant Ministries via e-mail.</p> <p>Authorities and IAPs could review the Scoping Report and submit comments in writing to SLR. The comments period commenced on the 7th of November and the closing date for comments was 30 November 2016.</p>	
MET review of Scoping Report and EMP	A copy of the final Scoping Report, including authority and IAP review comments, was delivered to MET on completion of the public review process.	December 2016

2.3.3 SUMMARY OF ISSUES RAISED

All issues that have been raised throughout the process by authorities and IAPs are provided in Appendix B to the Scoping Report. Issues and questions pertain to:

- Land use
- Groundwater and Surface water pollution
- Air quality – dust
- Socio-economic issues.

A Summary Issues & Response Report is attached in Appendix D.

3. ENVIRONMENTAL LAWS AND POLICIES

The Republic of Namibia has five tiers of law and a number of policies relevant to environmental assessment and protection, which includes:

- The Constitution.
- Statutory law.
- Common law.
- Customary law.
- International law.

Relevant policies currently in force include:

- The EIA Policy (1995).
- Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation (1994).
- The National Climate Change Policy of Namibia (September 2010).
- Minerals Policy of Namibia (2004).
- Policy for the Conservation of Biotic Diversity and Habitat Protection (1994).
- Policy for Prospecting and Mining in Protected Areas and National Monuments (1999).

As the main source of legislation, the Constitution of the Republic of Namibia (1990) makes provision for the creation and enforcement of applicable legislation. In this context and in accordance with its constitution, Namibia has passed numerous laws intended to protect the natural environment and mitigate against adverse environmental impacts.

The management and regulation of mining activities falls within the jurisdiction of the Ministry of Mines and Energy (MME), with environmental regulations guided and implemented by the Department of Environmental Affairs (DEA) within the Ministry of Environment and Tourism (MET).

The section below summarised the various applicable laws and policies, international treaties and protocols.

3.1 SUMMARY OF APPLICABLE ACTS & POLICIES

In the context of the Ohorongo Operation, there are several laws and policies currently applicable. They are reflected in Table 6.

TABLE 6: RELEVANT LEGISLATION AND POLICIES FOR THE OHORONGO OPERATION

YEAR	NAME	Natural Resource Use (energy & water)	Emissions to air (fumes, dust & odours)	Emissions to land (non-hazardous & hazardous)	Emissions to water (industrial & domestic)	Noise (remote only)	Visual	Vibrations	Impact on Land use	Impact on biodiversity	Impact on Archeology	Emergency situations	Socio-economic	Safety & Health	Other
1990	The Constitution of the Republic of Namibia of 1990	X	X	X	X	X	X	X	X	X	X	X	X	X	
1997	Namibian Water Corporation Act, 12 of 1997	X											X		
1992	The Minerals (Prospecting and Mining) Act 33 of 1992	X	X	X	X					X					
2001	The Forestry Act 12 of 2001	X							X	X					
2013	Water Resources Management Act 11 of 2013	X			X								X		
2004	National Heritage Act 27 of 2004										X			X	
2007	Environmental Management, Act 7 of 2007	X	X	X	X	X	X	X	X	X	X		X	X	
2012	Regulations promulgated in terms of the Environmental Management, Act 7 of 2007	X	X	X	X	X	X	X	X	X	X	X	X	X	X
1975	Nature Conservation Ordinance 14 of 1975	X			X					X	X				
1976	Atmospheric Pollution Prevention		X												

YEAR	NAME	Natural Resource Use (energy & water)	Emissions to air (fumes, dust & odours)	Emissions to land (non-hazardous & hazardous)	Emissions to water (industrial & domestic)	Noise (remote only)	Visual	Vibrations	Impact on Land use	Impact on biodiversity	Impact on Archeology	Emergency situations	Socio-economic	Safety & Health	Other
	Ordinance 11 of 1976														
1995	Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation	X	X	X	X	X	X	X	X	X	X	X		X	
2004	Pollution Control and Waste Management Bill (3rd Draft September 2003)		X	X	X	X									
1990	Petroleum Products and Energy Act, No. 13 of 1990		X	X	X					X				X	X
1974	Hazardous Substance Ordinance, No. 14 of 1974														X

3.2 CONVENTION ON BIOLOGICAL DIVERSITY

This treaty re-affirms that countries are responsible for conserving their biological diversity and using biological resources in a sustainable manner. The following definition applies: “Biological diversity means the variability among living organisms from all sources, inter alia terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems” (Convention on Biological Diversity, 1992). Namibia is a signatory to this and other international conventions and, according to article 114/144 of the Namibian Constitution, the government is subject to the law of these conventions.

4. DESCRIPTION OF THE PROPOSED EXPANSION TO THE OHORONGO OPERATION

Ohorongo Cement holds a Mining Licence (ML 153) on the farm Sargberg 585, and operates the Ohorongo Cement Factory and Quarry within this area. Furthermore, Ohorongo Cement also holds two Exclusive Prospecting Licences (EPLs), namely EPL 3371 and EPL 5166, which surrounds ML 153. (Refer to Figure 1).

Ohorongo Cement has conducted exploration activities on the EPL areas and, according to the results of the raw mineral resource evaluation, suitable raw material resources were identified within these areas (Schwenk Zement KG, 2016). It is proposed to use these additional raw materials (Special Grade Limestone and Special Silica Sand) in the existing cement manufacturing process.

These raw materials are present within the EPL sites located on Ohorongo Cement's neighbouring farms Ma Foi 784 and Hannover 549. Ohorongo Cement is applying to the Ministry of Mines and Energy (MME) for a new Mining Licence covering sections of both EPLs to access the raw materials from a proposed new pit and quarry. (Refer to Figure 2).

Ohorongo Cement therefore proposes to extend the mining into the EPL areas. There will be no changes to the manufacturing operations at the Ohorongo Cement Factory.

This section describes the proposed new silica sand pit and limestone quarry (including associated ancillary infrastructure) in relation to the approved infrastructure and current activities at the Ohorongo Operation.

This section of the report will however not repeat detailed descriptions of activities and facilities that will not change from that those presented in the 2008 EIA. The focus will be on the proposed expansion activities, and associated environmental aspects and impacts that need to be re-assessed. The relevant reports from the previous EIA process (CCA, 2008) will be made available on request to SLR.

Due to the nature of the proposed project, i.e. small scale open pit mining with limited support infrastructure, there will be no construction phase. Therefore, the description and assessment of the construction activities will not be repeated in this report.

4.1 APPROVED FACILITIES AT THE OHORONGO OPERATION

The following facilities were approved following the successful completion of the 2008 EIA process, the details of which will not be repeated in this report (the 2008 EIA Report is available from SLR on request):

- Quarry: For the mining of limestone, marl and shale.

- Cement Manufacturing Plant: Including crusher, raw mill, kiln, clinker storage, cement mills, cement storage and cement packing facilities.
- Support infrastructure: Including roads, conveyors, stores, powerline, water supply pipeline etc.

4.2 PROPOSED EXPANSION TO THE OHORONGO OPERATION

With reference to Figure 2, the table below summarises the proposed expansion areas associated with the approved Ohorongo Operation.

TABLE 7: SUMMARY OF THE PROPOSED EXPANSION AT THE OHORONGO OPERATION

Relevant project component	Description of proposed expansion to operations
Mining plan	<p><u>Special Limestone Quarry</u></p> <p>The new quarry will be located on the farm Hannover 549, west of the existing Ohorongo Operation. The new quarry will cover an area of approximately 2 hectares over a period of 25 years and will have the following approximate dimensions:</p> <ul style="list-style-type: none"> • Length x width: 150 x 150 m • Total mining area over 25 years: ± 2 Ha • Maximum depth: ±10 m <p>Due to the limited demand for these raw materials, it is expected that mining operations will be carried out in campaigns rather than continuous operation. It is expected that the total demand of Special Grade Limestone of 1,000 tonnes per year will be extracted in one single campaign of approximately 1 to 2 weeks per year.</p>
	<p><u>Special Silica Sand</u></p> <p>The proposed sand pit will be located on the farm Ma Foi 784, south east of the existing Ohorongo Operation. The proposed pit will cover an area of approximately 4 hectares for a period of 25 years and will have the following approximate dimensions:</p> <ul style="list-style-type: none"> • Length x width: 260 x 150 m • Total mining area over 25 years: ± 4 Ha • Maximum depth: ±10 m <p>Due to the limited demand for these raw materials, it is expected that mining operations will be carried out in campaigns rather than continuous operation. It is expected that the total demand of Special Silica Sand of 5,000 tonnes per year will be extracted in five to ten weeks per year.</p>

Taking the above mentioned information into consideration, the following Sections (4-3 to 4-6) provide more detail regarding the proposed expansion.

4.2.1 MINING

4.2.1.1 MINING METHOD

The raw materials will be extracted largely by Free Digging. It is expected that the Special Silica Sand will be freely dug out by means of hydraulic excavators. Raw material from the Special Grade Limestone will be drilled and blasted only in areas that are too hard for free digging. The preferred mining method will be to dig freely or use hydraulic excavators wherever possible.

Mining activities will take place to a maximum depth of 10 m.

4.2.1.2 DRILLING AND BLASTING OPERATIONS

The drilling equipment fleet consists of rotary drills (diesel powered units). The planned nominal production blasthole pattern is a grid of 4 x 4 m spacing with a drilling depth maximum of 10 m. Ammonium nitrate fuel oil (ANFO) bulk explosives will be used predominantly. Emulsion explosives will be used if necessary. The powder factor for production blasting is estimated to be at least 0.30 kg/t (kilogram explosive per tonne of rock), based on similar situations for blasting calcrete, and may be higher. The actual amount will be confirmed during mining activities.

Ohorongo Cements special equipped and approved explosives vehicle will deliver explosives to the blast sites, and manual labour will be used for blast hole stemming. The mine blasting crew will have responsibility for managing and conducting the blasting operations. Normal safety precautions will be observed to alert personnel ahead of actual blasting taking place.

4.2.1.3 LOADING, OFF-LOADING AND HAUL OPERATIONS

The main loading equipment fleet is planned to consist of diesel powered wheel loader and/or excavators capable of loading mine haul trucks to have a maximum mobility and flexibility. Loaders will also be used for cleaning up working faces.

The main hauling equipment fleet is expected to consist of diesel dump trucks.

4.2.1.4 MINING EQUIPMENT

Major mining equipment includes wheel loaders, haul trucks, hydraulic excavators, rotary drills and dozers as well as mining support equipment such as track dozers, rubber-tyred dozers, graders and water trucks that are currently located at the approved Ohorongo Operations.

4.2.1.5 OTHER MINING ACTIVITIES

Support activities will include road and ramp development, clean-up in the loading areas, maintenance of roads, ramps and operating surfaces and other site development. Additional support equipment will

include mobile maintenance equipment units (fuel/lube trucks and mechanics' trucks), support trucks and other equipment.

Minimal non-mineralised waste will be generated as part of the proposed expansion. Due to the size and scale of the proposed expansion project, it is expected that the types of waste would be limited to small quantities of both domestic waste and hazardous waste (oily rags etc.). Waste at the pit and quarry sites will be separated according to type and transported to the existing Ohorongo Operations where it will be dealt with in accordance with the existing waste management procedures and in accordance with ISO 14 001 requirements.

4.2.2 CEMENT MANUFACTURING PROCESS

There are no planned changes to the existing cement manufacturing plant or production output. The Special Grade Limestone and Special Silica Sand will however improve the quality control process of the cement being manufactured at the factory.

4.2.3 POWER SUPPLY

Diesel powered generators will be used for power supply during the mining campaigns wherever and whenever needed.

4.2.4 FUEL SUPPLY AND STORAGE

Diesel is the main consumable and will be required for the generators (mentioned in Section 4.5) as well as vehicles used during the mining campaigns. The existing diesel storage facilities within Ohorongo Operation (240 000 litres) will be used for the described mining activities. No new diesel storage facilities will be erected at the new mining sites.

4.2.5 WATER REQUIREMENTS

Water for the approved Ohorongo Operation is sourced from boreholes located on the farm Sargberg 585. Approximately 60 000 m³ per annum is used as part of the existing operation. The proposed expansion will require < 5 000 m³ per annum additionally. It is planned that this water will be sourced from the existing boreholes located on the farm Sargberg 585 and transported to the proposed new mining areas by water truck. Water will only be used for dust suppression of the haul roads as and where required.

4.2.6 TRANSPORT REQUIREMENTS

Due to the scale of the proposed project, it is proposed that existing roads/tracks will be used to transport the raw material to the cement factory. (Refer to Figure 2 for the proposed transport routes). These roads/tracks will be upgraded, where required.

The limestone will be hauled, for the entire distance, from the proposed new quarry to the factory along existing proposed access route or the existing alternative access route farm roads/tracks.

The silica sand will be hauled, first along existing farms roads/tracks, turning onto the B1 for approximately 9 km before turning off onto the existing Ohorongo Cement access road.

It is expected that the amount of Special Grade Limestone required for the cement manufacturing process will result in approximately 30 CAT 740 dump truck trips per year, while the Special Silica Sand will result in approximately 170 road truck trips (each around 25 ton) per year.

However, with reference to section 4.2, it is expected that the total demand of Special Grade Limestone of 1,000 tonnes per year will be extracted in one single campaign of approximately 1 – 2 weeks per year; and the total demand of Special Silica Sand of 5,000 tonnes per year will be extracted in five to ten weeks per year.

Taking the above-mentioned into considerations, the number of trips per day during the campaigns is summarised in the table below:

TABLE 8: ESTIMATED NUMBER OF TRIPS PER DAY FOR EACH CAMPAIGN

Campaign	Special Grade Limestone		Special Silica Sand	
	1 week per year	2 weeks per year	Five weeks per year	10 weeks per year
Volume per campaign	1,000 tons = 30 trips		5,000 tons – 170 trips	
Trips per day (5 day working week)	6	3	6.8	3.4

Ohorongo Cement will make use of their own CAT truck fleet for the above mentioned activities in the Special Grade Limestone pit. For the mining of Special Silica Sand, Ohorongo will use for the part of transport that will use the public road the service of a logistic partner with typical side tipper road trucks.

4.2.7 TIME TABLE

The life of the two new pit areas is approximately 25 years, however this will not extend the life of the existing Ohorongo Operation. As stated in the 2008 EIA (CCA, 2008), the life of the existing operations is expected to be at least 100 years.

4.2.8 EMPLOYMENT

The existing Ohorongo cement factory and quarry currently employs approximately 320 permanent and temporary employees and 50 contractors (and sub-contractors). Due to the nature and scale of

the proposed expansion project, no additional employment opportunities will be created. It is planned that existing employees will be used to mine the proposed new areas during the mining campaigns.

4.3 DECOMMISSIONING AND CLOSURE PHASE OF THE TWO NEW MINING AREAS

4.3.1 CLOSURE OBJECTIVES

In broad terms the main closure objective will be to remove as much infrastructure as possible and rehabilitate what remains to resemble the pre project land state as closely as possible.

4.3.2 DECOMMISSIONING ACTIVITIES

The conceptual decommissioning plan must include:

- Surface infrastructure will be removed from site. As the open pits will remain in perpetuity, they will be 'made safe' to prevent injury to third parties (refer to Section 4.2.3 below).
- Areas where infrastructure has been removed will be levelled and restored in terms of soils horizons, vegetation and drainage.

4.3.3 PIT AND QUARRY DECOMMISSIONING

Decommissioning of the pit and quarry areas will be in line with the Ohorongo Operation's Decommissioning and Closure Plan.

Access ramps to the open pit and quarry will be bunded off to prevent access down the ramps and the top berm of the pit will be sloped to an angle of approximately 45 degrees.

The pit and quarry slopes will be assessed and stabilised for long term stability performance and to prevent future harm to people or wildlife.

4.3.4 MINERALISED WASTE FACILITIES

All overburden remaining at the end of the life of mine will be returned to the pit/quarry. Topsoil will be spread on top of the material to rehabilitate these areas.

4.3.5 CLOSURE ACTIVITIES

All mining activities and manufacturing operations will have ceased by the closure phase of the operation. The potential for impacts during this phase will depend on the extent of demolition and rehabilitation efforts during decommissioning and on the features which will remain, such as the open pit areas.

5. DESCRIPTION OF THE CURRENT ENVIRONMENT

The existing Ohorongo Operation can be reached from the capital city, Windhoek, some 340 km to the south along the B1 national road, which is a surfaced road in excellent condition. Windhoek is connected by direct commercial air travel from several European countries, South Africa and other African countries.

The large regional town of Tsumeb, a mining centre in its own right, is located some 39 km north east of the project area, along the B1 road. A domestic airport is located at Tsumeb, currently with both scheduled and charter flights connecting with Windhoek. The smaller town of Otavi lies some 18 km south west from the existing Ohorongo Operation near the cross roads of the main north-south National Road B1, the road to Grootfontein and the road to Outjo. Otavi is also on the north-south railway line that was constructed to transport goods from Tsumeb to Swakopmund and Walvisbay. Internal access to the project area is via a well-maintained network of farm roads. Given the arid climate of the area, these roads are generally passable all year-round.

This section has been compiled by referring extensively to the environmental baseline descriptions contained in the 2008 EIA report (CCA, 2008) as well as from recent site visits undertaken by the EIA project team. Additional information that was used to further update this section includes a biodiversity assessment that was undertaken for the proposed project.

The detailed description of the current environment relating to the wider Ohorongo Project Area and surroundings will not be repeated in this Scoping Report. The aspects, more specific to the proposed expansion, are however described below. The social and economic baseline was also described in detail in the 2008 EIA and will not be repeated in this Scoping Report.

5.1 CLIMATE

This section summarises the main climatic parameters within the Ohorongo Operational area.

5.1.1 TEMPERATURE

The average maximum temperatures during the hottest month, December, are in the range of 32 – 34 °C. The average minimum temperatures during the coldest month, July, are in the range of 4 – 6 °C. Frost may occur 1 – 5 days per year.

5.1.2 PRECIPITATION

The mean annual rainfall for the study area is 500 – 550 mm. Almost all rain falls between October and April, with the wettest months being January and February.

5.1.3 HUMIDITY

Values for relative humidity in the driest month (September), range from 10 – 20%. In the most humid months (February and March), the values for RH are in the range of 80 – 90 %.

5.1.4 SOLAR RADIATION

The area is relatively dry and experiences intense solar radiation in the range of 6.0 – 6.2 kWh/m²/day on average. This is close to the highest values for Namibia.

5.1.5 WINDS

The nearest wind data available is for Grootfontein (approximately 70 km east of the Ohorongo Operation). It must be noted that there is no prevailing wind direction. The wind blows from any direction with only a slightly greater frequency from the east. Calm conditions occur for 41 % of the time, more commonly at night. Strong easterly winds blow for several days a year in Namibia, mainly in spring. These are known as Berg Winds. They are hot and dry and result in a considerable increase in fire hazard ratings.

5.2 TOPOGRAPHY AND DRAINAGE

The steep east-west ridge (south of the proposed Special Limestone quarry) shown in Figure 2 rises some 500 m above the surrounding plains which are fairly flat. The surface drainage is typical of drainage in limestone or karst areas in that watercourses from the ridge end abruptly on the plains as the water seeps into the ground. In this regard, there is a drainage line that flows from the ridge onto the plain in close proximity to the proposed grade limestone quarry. The proposed silica sand pit is located on the flat plains. The overall drainage pattern is northward and then westward, as part of the Ugab catchment. However there is little surface water flow on the plains for the abovementioned reason.

5.3 GEOLOGY

The Ohorongo Operations are located on the Maieberg and Ghaub formations of the Otavi Group (Tsumeb Subgroup), on the northern side of the Maieberg Syncline.

5.4 HYDROGEOLOGY

The site is within the Tsumeb-Otavi-Grootfontein Subterranean Water Control Area – GN 1969 of 13 November 1970 and Proclamation 278 of 31 December 1976. Therefore a permit is required to drill boreholes, and to utilise groundwater for industrial and domestic use. The Department of Water Affairs

has divided the Karst aquifers into compartments for the purpose of regulating abstraction of groundwater. The Ohorongo Operation falls into Compartment G, where a total abstraction of 1.5M m³/annum is permitted to be abstracted. Water quality in the area is generally good.

Groundwater monitoring over the wider area of the Otavi Mountain Lands (OML) in the past indicates a steady decline in the water levels in the OML.

Groundwater flow in the area takes place mainly along fractures and contact zones within hard rock formations. Groundwater in the area flows in a north westerly direction as inferred from historical groundwater data.

Groundwater in the area is extensively utilised with more than 500 known boreholes in a 30 km radius, more than 50 within 10 km, and approximately 15 within a 5 km radius.

Existing boreholes in the area are drilled to less than 50 m deep and yield approximately 5 m³/day. Residence time of groundwater is low and the groundwater table reacts rapidly to recharge and/or abstraction. As part of the 2008 EIA study, a borehole was sunk on the farm Sargberg 585. The rest water level at the time was 31.52 m below ground surface. Pump tests revealed a yield of approximately 4 m³/h. The transmissivity value was calculated at 38 m²/d. This is a low level of transmissivity.

Many karst features occur in the OML due to the solution of limestone and dolomite along joints and fractures that have provided a passage for water. Solution features can result in springs, where an underground "stream" intersects the ground surface, and caves. The nearest cave that is known to contain water is Aikab Hericenote, approximately 20 km away from the Ohorongo Operation. Furthermore, a spring is known to exist some 6 km north of the Ohorongo Operation, but no other karst features are known nearby.

5.5 SOILS

The soil appears to be sandy, ranging in colour from pale brown to grey with broken calcrete pieces in it, to fine red sand. The stunted vegetation on the plains suggests that the soils is not very deep, or possibly the presence of a calcrete or shale layer may limit rooting depth. Approaching the ridge to the south of the Ohorongo Operation, the talus slopes have deeper soil which supports large trees.

Typical in this semi-arid climate the organic content of soils is usually low, with poorly developed topsoil or A-horizon. The topsoil is likely to be better developed in the more densely vegetated woodlands near the base of the hills.

5.6 BIODIVERSITY

A biodiversity survey was undertaken as part of the 2008 EIA (CCA, 2008). The detailed findings of the study will not be repeated in this report. A project specific biodiversity investigation was conducted for the proposed expansion (AWR, 2016). The findings of the 2016 investigation are included in Sections 5.6.1 and 5.6.2 below.

5.6.1 FLORA

Desktop findings

Both the 2008 and 2016 investigations noted that the area had a fairly high diversity of plant life for Namibia. In this regard, the region has a rich structural and floristic diversity. A total of 192 plant species have been recorded in the quarter degree square 1917CB, seven of which are endemic plants species and twenty are protected plant species.

Fieldwork findings

The project area falls in the Acacia Tree-and-shrub Savanna biome with Karstveld type vegetation consisting of mixed woodlands. Strohbach (2008) identified six macro-habitat types in the landscape surrounding the Ohorongo Cement factory area, namely:

- Karstveld plains;
- Footslopes;
- Low limestone hills;
- Steep limestone hills;
- Intermontane valley;
- Kalahari sands.

The site of the proposed sand pit falls in the Kalahari sands habitat and the limestone quarry in the Low limestone hills habitat type.

The site of the proposed sand pit falls in the Kalahari sands macro-habitat. The vegetation structure is open woodland with dense grass cover and a well developed shrub layer. The vegetation is characterised by large *Terminalia sericea* and *Acacia flecki* trees, interspersed with *Bauhinia petersiana*, *Acacia ataxacantha*, *Peltophorum africanum*, *Lonchocarpus nelsii*, and an occasional *Burkea africana*, the last three of which are protected under the Forestry Act. Ground orchids (*Habenaria sp*) have been observed on the farm. Open woodland with a dense shrub layer can support a large variety of vertebrate taxa: woody habitat for bird species such as aerial feeders, gleaners, frugivores and hole nesters; thickets for insectivores and reptiles; and the sandy soil provides substrate for burrowing reptile species. Although the habitat has been modified by livestock farming and fire, it is capable of supporting a relatively high biodiversity.

The site of the proposed limestone quarry falls in the low limestone hills macro-habitat. It lies on the crest of a low-gradient, low altitude ridge running east to west. Vegetation structure is open bushland with fairly low species diversity and poor grass cover. The substrate favours limestone mountain species like *Commiphora glaucescens*, *Combretum apiculatum* and *Terminalia prunioides*.

5.6.2 FAUNA

Desktop findings

Mammals

Mammal richness for the region is high with 92 species possibly occurring, but the many livestock and game farms in the region and their fences inhibit the movement of large mammals. Five of the mammal species are in the IUCN's Vulnerable or Near-threatened categories and four are considered Vulnerable or Near-threatened in Namibia (Cheetah, Brown Hyena, Pangolin, African Wild Cat). An additional ten species, mainly rodents and bats, are possibly of conservation interest but not enough data is available to categorise them. No Namibian endemic or near-endemic mammal species are present in the region.

Birds

According to SABAP 2, 301 bird species were identified in the quarter degree square 1917CB. The project area and surrounding habitat types provide highly suitable habitat for 156 and moderately suitable habitat for 48 bird species. At the international scale, three species are considered Vulnerable, seven species Near-threatened and one species (White-headed Vulture) Critically endangered. However, more of the 301 recorded species are considered endangered on the national scale (refer to Table 9).

TABLE 9: INTERNATIONAL AND NATIONAL CONSERVATION STATUS OF BIRD SPECIES

Categories	International (IUCN) Red Data List	Namibian Red Data List
Near-threatened	7	8
Vulnerable	3	5
Endangered	-	12
Critically endangered	1	3

Reptiles

The distribution ranges of 80 reptile species overlap with the project site, with habitat suitability being high or medium for 51 of these species. This is relatively high species diversity.

Only ten of the species expected to occur on the site have been assessed for international conservation status by the IUCN and they are considered to be of Least Concern. On the national level, two species are considered Vulnerable, three species Endangered and five are Data Deficient but probably Rare.

Amphibians

Distribution ranges indicate that fourteen amphibian species could possibly occur in the area, with medium or high habitat suitability for nine of these. No endemic species are expected to occur. In the

Namibian context it is medium-ranking amphibian diversity and the presence of most of the species are dependent on seasonally available open water.

Fieldwork findings

No signs of large vertebrates were detected in the open woodland vegetation type associated with the proposed silica sand pit. This could be attributed to a recent fire covering a large part of the site. However, 34 bird species were identified during the short field investigation. With regards to the open bushveld vegetation type associated with the proposed limestone quarry, the area has been subjected to livestock grazing. No signs of other vertebrates were visible at the site.

5.7 AIR QUALITY

The project area spans across a semi-arid area. The current dry weather conditions, as well as the areas being grazed exposes the soils to winds and generating a relatively dusty environment. Furthermore, the few roads/tracks in the area are all gravel (except for the B1 and the access road to the existing Ohorongo Cement factory) and any traffic will generate dust. However, the population and activity in the area is very low.

The current (approved) mining activities generate some dust. The operations at the existing cement manufacturing plant generate very little visible dust. The 2008 EIA assessed the significance of air quality impacts from the quarry, crushers and tracks; and the manufacturing plant to be medium and low respectively, without mitigation.

No dust monitoring is currently taking place and therefore emissions listed above cannot be quantified.

5.8 Archaeology

The proposed project area is not expected to contain archaeological artefacts of importance (pers comm, John Kinahan – Archaeologist).

Furthermore, no visible archaeological artefacts or heritage sites were noted in the vicinity of the proposed two mining areas by SLR during the site visits and neither did any of the neighbouring IAPs raised any such concerns during the public participating process.

5.9 VISUAL

The area surrounding the proposed project area is currently used for farming activities and industry (i.e. the Ohorongo Operation). The area has no unique scenic features, however the B1 road is frequently

used by tourists traveling between Windhoek and the north of Namibia as well as Etosha. The landscape character of the area is therefore regarded as low to moderate.

5.10 NOISE

The ambient noise level around the proposed project areas is expected to be of a typical rural environment. Existing noise sources include:

- The approved Ohorongo Operation, located approximately 4 km from the proposed limestone quarry and 6 km from the silica sand pit.
- Roads and related traffic. The B1 is located approximately 1.5 km south east of the proposed silica sand pit and the D3031 is located approximately 7 km west of the proposed limestone quarry.

Potential sensitive noise receptors include the farming and tourism activities described in Section 5.11 below.

5.11 SURROUNDING LAND USE AND CLOSEST SENSITIVE RECEPTORS

5.11.1 LAND USE

Land use within the proposed project area is limited to livestock grazing (that has been severely degraded by bush encroachment) and burning of the encroached bush. The area has an extremely low population density.

The area has no unique scenic features that could be of interest to tourists. Some game/hunting farms and lodges exist further away, i.e. Ohange Lodge, which is located east of the B1, more than 10 km to the north-east of the proposed silica sand pit.

Therefore there is not alternative land uses envisaged that could compete with the proposed mining activities.

The proposed project areas are located on the farms Ma Foi 784 and Hannover 549. The farm Hannover 549 is a resettlement farm owned by the State (care of the Ministry of Lands and Resettlement), while the farm Ma Foi 784 is owned by Schwenk Namibia Pty Ltd.

5.11.2 CLOSEST SENSITIVE RECEPTORS

The closest sensitive receptors to the proposed silica sand pit and limestone quarry included the following (Refer to Figure 4):

- Shed - ±1.5 km south of the silica sand pit.

- Farm house - ±2.6 km north-east of the limestone quarry and immediate next to the proposed access/haul road.
- Farm “outpost” - ±3.3 km east-north-east of the limestone quarry and immediate next to the proposed access/haul road.
- Farm house - ±2.5 km west-north-west of the limestone quarry (located on Hannover 549).

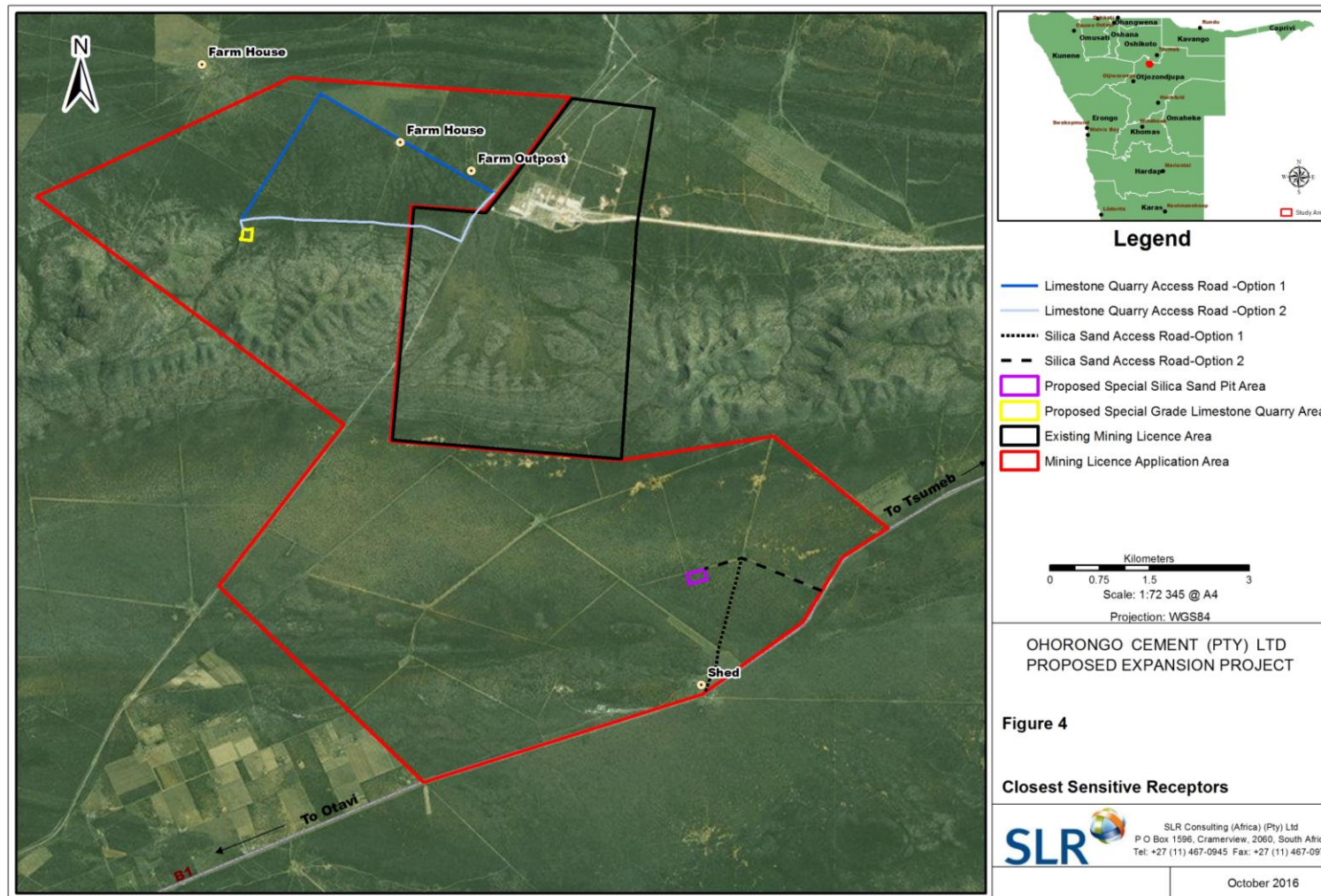


FIGURE 4: CLOSEST SENSITIVE RECEPTORS

6. ALTERNATIVES

Due to the nature and the scale of the proposed project, limited alternative options exist as described below.

6.1 INFRASTRUCTURE LAYOUT

The relative location of the pits is fixed by geological constraints, therefore no alternative sites have been considered. Small variations to these locations were however considered within a slightly larger suitable geological footprint (resource) area. However, the specific silica sand pit and limestone quarry locations were preferred due to accessibility. Also, the limestone quarry is located south of the drainage line that flows from the ridge onto the plain (refer to section 5.2).

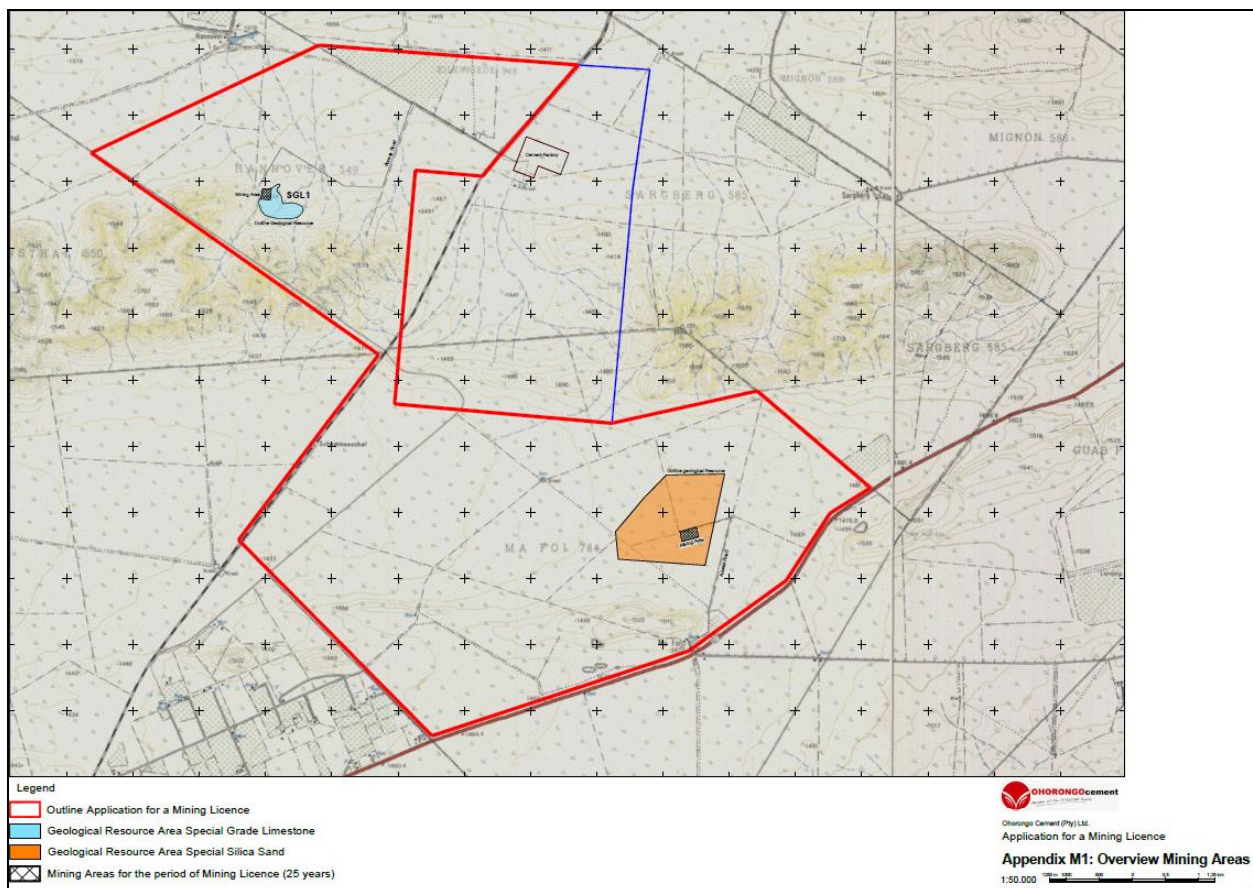


FIGURE 5: GEOLOGICALLY SUITABLE FOOTPRINT (RESOURCE) AREAS FOR THE SILICA SAND PIT AND LIMESTONE QUARRY

6.2 MANUFACTURING PROCESS

The raw materials will be incorporated into the Ohorongo Cement manufacturing process at the existing manufacturing plant. No alternatives have been considered.

6.3 ALTERNATIVE TRANSPORT ROUTES AND MECHANISMS

The volume of project related traffic is expected to be small, i.e. 30 dump truck trips per year for the special grade limestone and 170 dump truck trips per year for the silica sand.

Different campaigns are being considered for each mining area (refer to Section 4.2.7), as follows:

Special grade limestone

- 1 week per year = 6 trips per day
- 2 weeks per year = 3 trips per day

Due to the existing farm house and farm 'outpost' on the preferred transport route for the limestone quarry (refer to the Limestone Quarry Option 1 in Figure 4), various alternative options have been considered, namely:

- The establishment of a new access road/route;
- Relocate the people living in the homestead and cattle post out with the impact zone. This could either be a permanent measure (i.e. build new homestead / cattle post out with the dust fallout zone) or a temporary measure during the time that mining activities at the limestone quarry are active (i.e. move people to alternate lodgings or new home for a few weeks).
- Management and mitigation measures to reduce noise, dust and safety impacts.

The preference would be to establish an alternative access road. (Refer to Figure 4 for the Limestone Quarry Option 2). This route follows an existing track and an existing cut line that has already been partially cleared. Be widening this line and constructing the haul road will cause limited additional biodiversity impacts (refer to Section 8.1).

The relocation of people can be considered as a second option, however there will be further socio-economic implications and potential impacts to be considered. By implementing management and mitigation measures along the route next to the house and outpost will most not reduce the potential impacts to acceptable levels.

Silica sand

- 5 weeks per year = 6.8 trips per day
- (up to) 10 weeks per year = 3.4 trips per day

By spreading the trips over a longer period, specifically for the silica sand, the trips per day will be reduced and there will be less additional traffic on the B1. However, due to the short section that the haul trucks will travel on the B1 road and relatively low numbers of trips per day, the impacts of additional traffic on the B1, even over the shorter time period, is not expected to be significant.

Two route options have been considered for the haul trucks to get to the B1 (refer to Silica Sand Pit Options 1 and 2 in Figure 4). Option 2 is the chosen alternative as it is the shortest route and it avoids third party infrastructure.

6.4 THE “NO-GO” OPTION

The assessment of this option requires a comparison between the alternative of proceeding with the proposed expansion to the Ohorongo Operation (i.e. the special grade limestone quarry and special grade silica sand pit) with that of not proceeding with the proposed expansion.

Proceeding with the proposed expansion will result in Ohorongo Cement being able to mine the mineral resources that has been discovered on the farms Ma Foi 784 and Hannover 549, thereby obtaining the required additional raw materials for their manufacturing plant. This would be beneficial as the quality of the final product would be improved, also ensuring long term continuous operations.

Should the proposed expansion not proceed, the situation would remain as is. The quality control process of the current cement production would not change and the scheduled quality improvement steps would not take place. The mineral resources would remain in situ.

Even though these proposed expansion may result in potential (additional) negative environmental and social impacts which are discussed in detail in Sections 7 & 8 of this report, it can be concluded that proceeding with these proposed expansion will benefit the Ohorongo Operation, which in itself (continues) to result in significant positive social and economic impacts such as employment, investment and procurement of goods and services, as indicated in the 2008 EIA.

7. IDENTIFICATION AND DESCRIPTION OF POTENTIAL ENVIRONMENTAL IMPACTS

7.1 ASPECT AND IMPACT IDENTIFICATION

Table 7-1 provides a summary of all the operational activities/facilities and the potential impacts associated with the new silica sand pit and limestone quarry. Land clearing activities associated with the new facilities are also incorporated.

As described in Section 4, no construction activities as a result of the proposed expansion are foreseen.

The decommissioning and closure objectives of the proposed new pit and quarry will be in line with the rest of the (approved) facilities. No assessment table has therefore been included for the decommissioning phase.

The relevance of the potential impacts (“screening”) are also presented in the tables below to determine if certain aspects need to be assessed in further detail (Section 8 of this report). Because of the existing baseline information obtained from the various specialist studies conducted in the past; the detailed history of Environmental Applications; the existing EMP; as well as the additional studies carried out, potential impacts can also be re-assessed (cumulatively) as part of this process. Also, the relevant management and mitigation measures, to minimise or prevent the potential impacts, will be provided in Section 8 of this report.

TABLE 10: ENVIRONMENTAL ASPECTS AND POTENTIAL IMPACTS ASSOCIATES WITH THE AMENDMENTS

ACTIVITY/FACILITY RELATING TO OPERATIONAL PHASE	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	RELEVANCE (SCREENING) OF POTENTIAL IMPACT	Ref
		(i.e. change from previously assessed impact)		
Special grade silica sand pit and Special grade limestone quarry	Clearing of bush and soil stripping (earthmoving equipment)	Potential impact on biodiversity (physical impacts and general disturbance)	<p>With reference to Sections 5.6.1 and 5.6.2, a biodiversity baseline study of the proposed project areas was conducted as part of this EIA. The potential impacts relating to the physical destruction and disturbance of biodiversity was assessed as medium significance during the 2008 EIA process.</p> <p>The special grade silica sand pit will cover an area of ± 4 ha while the special grade limestone quarry will cover an area of ± 2 ha. Both of these areas, as well as a small area for support infrastructure (± 0.5 ha), will require bush clearing.</p> <p>Taking the above mentioned into consideration, the potential (cumulative) physical impacts on biodiversity was re-assessed by African Wilderness Restoration (AWR) (refer to Section 8). The related management and mitigation measures are stipulated in the updated EMP (refer to Appendix F).</p>	R01
		Potential impact on archaeological sites	<p>With reference to Section 5.8, the proposed project area is not expected to contain archaeological artefacts of importance.</p> <p>Taking the above mentioned into consideration, this issue will not be further assessed in this report.</p>	R02

ACTIVITY/FACILITY RELATING TO OPERATIONAL PHASE	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	RELEVANCE (SCREENING) OF POTENTIAL IMPACT	Ref
		(i.e. change from previously assessed impact)		
	Dangerous excavations	Increased risk of Injury/fatality to animals or third parties falling/trapped in the pit/quarry.	<p>The proposed pit and quarry pose a risk for animals or third parties to fall into them and be killed or hurt.</p> <p>One of the key measures (currently in place for the existing facilities) to avoid this impact as far as possible is through the establishment of a fence along the perimeter of the working area in order to control access by third parties and wildlife. This measure will be implemented at the proposed new mining areas.</p> <p>Taking the above mentioned into consideration, the potential impacts on dangerous excavations have been assessed qualitatively by SLR as part of this EIA. Refer to Section 8 for the assessment of the potential impacts relating to dangerous excavations</p> <p>The related management and mitigation measures are stipulated in the updated EMP (refer to Appendix F).</p>	R03
	Open pit mining	Impact on surface water and groundwater water quality	<p>The proposed pit and quarry pose the risk of contamination of water resources, mainly through accidental spills of hydrocarbons etc. However, due to the scale of the project, there is a low risk of big hydrocarbon spillages. Similar equipment will be used to that assessed in 2008 EIA (refer to Section 4.2.1.4).</p> <p>Management and mitigation for containing and clean-up measures relating to hydrocarbon spillages were included in the 2008 EIA. Due to the fact that the proposed additional mining activities are very similar to those of the approved Ohorongo Operation (though on a smaller scale), as well as the fact that similar equipment will be used to what was assessed in the previous EIA, these management and mitigation measures remain applicable.</p> <p>The related management and mitigation measures as presented in the 2008 EMP remain valid (refer to Appendix F for the updated EMP).</p>	R04

ACTIVITY/FACILITY RELATING TO OPERATIONAL PHASE	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	RELEVANCE (SCREENING) OF POTENTIAL IMPACT	Ref
		(i.e. change from previously assessed impact)		
			Taking the above mentioned into consideration, the potential impacts relating to hydrocarbon spillages will therefore not be assessed further in this report.	
		Hydrological regime alterations (Loss of surface water flow volume as an important ecological driver due to a reduction to the downstream flow)	<p>With reference to Section 5.2, the area where the proposed silica sand pit is located is flat open plains. The proposed limestone quarry is located in close proximity to a drainage line that originates in the ridge. Stormwater management and flood protection measures will need to be implemented to reduce the impacts on the hydrological regime.</p> <p>Taking the above mentioned into consideration, the potential impacts on the hydrological regime have been qualitatively assessed as part of this EIA. Refer to Section 8 for the assessment of the potential impacts relating to hydrology.</p> <p>The related management and mitigation measures are stipulated in the updated EMP (refer to Appendix F).</p>	R05
		Impacts on Biodiversity	<p>Due to the disturbance and the fact that water tends to collect here, large holes in a relatively flat area has a way of attracting exotic invasive plants (thus providing a nucleus for further dispersal) and becoming an ecological trap for other species.</p> <p>Taking the above mentioned into consideration, the potential (cumulative) physical impacts on biodiversity was re-assessed by African Wilderness Restoration (AWR) (refer to Section 8). The related management and mitigation measures are stipulated in the updated EMP (refer to Appendix F).</p>	R06
	Drilling, blasting, loading and vehicle movement causing dust	Increase in dust levels (nuisance & health impacts)	<p>The generation of dust relating to the existing quarry, rusher, blasting, loading and vehicle movement and the impact thereof was assessed as medium significance during the 2008 EIA process.</p> <p>The proposed pit and quarry and associated activities will be of a relatively small</p>	R07

ACTIVITY/FACILITY RELATING TO OPERATIONAL PHASE	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	RELEVANCE (SCREENING) OF POTENTIAL IMPACT	Ref
		(i.e. change from previously assessed impact)		
			<p>scale and will be located relatively far from any receptors. However these new activities will contribute to an increase in dust levels as a result of mining activities (including possible blasting), loading and vehicle movement. The hauling of specifically the limestone, will cause dust near existing farm houses, depending the route being considered.</p> <p>Taking the above mentioned into consideration, the potential impacts on air quality (dust) have been qualitatively assessed as part of this EIA. Refer to Section 8 for the assessment of the potential impacts relating to air quality (dust).</p> <p>The related management and mitigation measures are stipulated in the updated EMP (refer to Appendix F).</p>	
	Drilling, blasting, and other mining activities causing noise	Increase in disturbing noise levels (nuisance)	<p>The increase in disturbing noise levels and the impact thereof was assessed as low during the 2008 EIA process.</p> <p>With reference to Section 4.2.1, similar mining activities will be applied, although mining will be on a smaller scale and not continuous and no manufacturing plant will be established. Therefore, even though there will be an increase in activities as a result of the new pit and quarry, the area is sparsely populated, and the nearest neighbours are 1.6 km and 2.5 km from the proposed limestone quarry and silica sand pit respectively.</p> <p>Based on the above, the noise impact severity is unlikely to change and the impact significance (with mitigation) will remain low. There would however be an increase in ambient noise levels associated with the hauling of the limestone near the farms house and cattle outpost. By choosing an alternative route (refer to section 6.3 and Appendix F) further away, this issue is not regarded significant, taking the small number of trips of a short time period into</p>	R08

ACTIVITY/FACILITY RELATING TO OPERATIONAL PHASE	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	RELEVANCE (SCREENING) OF POTENTIAL IMPACT	Ref
		(i.e. change from previously assessed impact)		
			<p>consideration. This issue will therefore not be further assessed in this report.</p> <p>The related management and mitigation measures as presented in the 2008 EMP remain valid (refer to Appendix F for the updated EMP).</p>	
	Blasting hazards	<p>Increase in ground vibration and fly rock ground vibrations have the potential to cause damage to surrounding structures and fly rock can be released over a distance and can be harmful to people and animals and damage structures and property.</p>	<p>The impacts from blasting activities were assessed as insignificant during the 2008 EIA. With reference to Section 4.2.1.2, the blasting activities will be similar in nature (or even smaller blasts) for the proposed pit and quarry.</p> <p>As explained during the 2008 EIA, the probability of blasting hazards resulting in either damage and/or creating a nuisance is low due to the remote setting of the project site and limited third party infrastructure in the vicinity of the open pit and quarry.</p> <p>Taking the above into consideration, also considering that the nearest receptors to the quarry (where blasting might be conducted) is 2.5 km away, the cumulative impact severity relating to blast hazards remains insignificant (with mitigation) and will not be further assessed in this report.</p> <p>The related management and mitigation measures as presented in the 2008 EMP remain valid (refer to Appendix F for the updated EMP).</p>	R09
	Dewatering associated with mining activities	<p>Lowering of groundwater table impacting on supply to surrounding water users</p>	<p>The groundwater abstraction at a local and regional level and the impact thereof was assessed as medium during the 2008 EIA process.</p> <p>With reference to Sections 5.4 and 4.2.1.1, similar mining activities will be applied, although mining will only take place to a depth of approximately 10 m. As the resting groundwater level was measured in excess of 30 metres below ground level, the proposed mining activities associated with the pit and the quarry are not expected to change the impact rating from the 2008 EIA.</p> <p>The related management and mitigation measures are stipulated in the updated</p>	R10

ACTIVITY/FACILITY RELATING TO OPERATIONAL PHASE	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	RELEVANCE (SCREENING) OF POTENTIAL IMPACT	Ref
		(i.e. change from previously assessed impact)		
			EMP (refer to Appendix F).	
Haulage and handling of mined out material	Noise from vehicles	Increase in disturbing noise levels (nuisance)	Refer to reference R08 (similar comments apply).	R08
	Dust and other air emissions	Increase in dust levels (nuisance & health impacts)	Refer to reference R07 (similar comments apply).	R07
	Haul trucks moving near farm houses	3 rd party safety	The hauling of the limestone very close to the farms house and cattle outpost pose a safety risk to third parties. This issue is qualitatively assessed in Section 8. The related management and mitigation measures are stipulated in the updated EMP (refer to Appendix F).	R11
	Oil and diesel spillages from earth moving equipment	Increased contamination of surface water and groundwater resources and pollution of soil	The potential for hydrocarbon spillages from earthmoving equipment (also during the refuelling of machinery and equipment) is always a possibility. Hydrocarbon spillages have the potential to cause an impact on soil and even groundwater. However, there is a low risk of big hydrocarbon spillages. Similar equipment will be used to that assessed in 2008 EIA (refer to Section 4.2.1.4). Management and mitigation for containing and clean-up measures relating to hydrocarbon spillages were included in the 2008 EIA. Due to the fact that the proposed additional activities are very similar to those of the approved Ohorongo Operation (though on a smaller scale), as well as the fact that similar equipment will be used to what was assessed in the previous EIA, these management and mitigation measures remain applicable. The related management and mitigation measures as presented in the 2008	R12

ACTIVITY/FACILITY RELATING TO OPERATIONAL PHASE	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	RELEVANCE (SCREENING) OF POTENTIAL IMPACT	Ref
		(i.e. change from previously assessed impact)		
			<p>EMP remain valid (refer to Appendix F for the updated EMP).</p> <p>Taking the above mentioned into consideration, the potential impacts relating to hydrocarbon spillages will therefore not be assessed further in this report.</p>	
Transport, storage and handling of hydrocarbons, mined material etc.	Increase in vehicular movement	Increased traffic impacts on the roads and the intersections to the mine access roads	<p>The increase of traffic and associated road safety impacts was assessed as medium low during the 2008 EIA process.</p> <p>With reference to Section 4.2.6, the proposed expansion relating to the pit and quarry will see a slight increase in project related traffic. This increase will be minimal and largely restricted to the unnamed farm roads. The Silica sand will however be transported on approximately 9 km on the B1. Due to the limited project related traffic (refer to Section 4.2.6), this is not expected to change the impact significance of the existing operations. However, Ohorongo Cement must liaise with the Namibian Roads Authority to establish additional safety mechanisms (e.g. road signs) at the B1 intersection.</p> <p>Should the alternative road to the proposed limestone quarry be chosen, it is recommended that the existing crossing over the railway line be used. The proposed road alignment is illustrated in Figure 2.</p> <p>Taking the above into consideration, the cumulative impact severity relating to an increase in project related traffic is unlikely to change and the impact significance (with mitigation) will remain medium low and will not be further assessed in this report.</p> <p>The related management and mitigation measures as presented in the 2008 EMP remain valid (refer to Appendix F for the updated EMP).</p>	R13

ACTIVITY/FACILITY RELATING TO OPERATIONAL PHASE	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	RELEVANCE (SCREENING) OF POTENTIAL IMPACT	Ref
		(i.e. change from previously assessed impact)		
	Potential spillage/leakage of hydrocarbons etc.	Pollution of surface water resources, groundwater resources and soil contamination	<p>The potential for hydrocarbon spillages during the transportation of hydrocarbons was assessed during the previous EIA as low (with mitigation). There will be no change to the type of equipment or management measures for these transport requirements as a result of the proposed expansion. The management and mitigation measures as presented in the approved EMP are therefore still relevant.</p> <p>This issue will therefore not be further assessed. Refer to Appendix F for the 2008 EMP.</p>	R14
General activities, offices and buildings, ablution facilities, waste generation	Waste disposal	Emissions to land, impact on biodiversity, environmental degradation and nuisance impacts	<p>With reference to Section 4.2.1.5, due to the nature and scale of the proposed expansion project, the type and volumes of non-mineralised waste will be minimal. With reference to Section 4.2.8, the operational workforce at the mine will not increase and therefore the overall waste generation is not expected to increase. The waste generated as part of the proposed expansion project would be transported to the existing Ohorongo Operation where it will be dealt with in accordance with the existing waste management procedures.</p> <p>This issue will therefore not be further assessed and the management and mitigation measures in the EMP remain relevant (Appendix F).</p>	R15
General operations, employment and resource management	Economic impacts In-migration and community health /safety and security	Impacts on local economy, informal settlements, increasing pressure on government services, increased demand for basic infrastructure, increased social ills,	<p>The reasons for expanding the mining activities were discussed in detail in Section 1.2 of the report and are (amongst others) economical in nature.</p> <p>The significance of the economic impacts associated with the Ohorongo Operations was assessed in the 2008 EIA to be substantial. The life of the operation remains unchanged as a result of the proposed expansion (see Section 4.2.7).</p> <p>The socio-economic assessment findings from the 2008 EIA therefore remain</p>	R16

ACTIVITY/FACILITY RELATING TO OPERATIONAL PHASE	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT (i.e. change from previously assessed impact)	RELEVANCE (SCREENING) OF POTENTIAL IMPACT	Ref
		etc.	relevant and will not be assessed in further detail as part of this report.	
	Impacts on neighbouring communities	Noise, air emissions, community health/safety and security etc.	Management and mitigation measures, as developed during the 2008 EIA process remain valid and are included in the EMP (Appendix F).	

With reference to Tables 7-1 above, the following issues were identified as requiring re-assessment.

- Physical impacts on biodiversity due to bush clearing activities;
- Third party (and animals) safety:
 - Dangerous excavations as a result of the proposed pit and quarry;
 - Third party safety associated with the haulage of the limestone;
- Hydrological regime alterations; and
- Air quality impacts (dust).

Refer to Section 8 of this Scoping Report for an assessment of the above mentioned issues.

8. ASSESSMENT OF RELEVANT ASPECTS & IMPACTS AND MANAGEMENT & MITIGATION MEASURES FOR ALL IDENTIFIED ASPECTS

The environmental aspects that require further assessment (as identified in Section 7 of this Scoping Report) relate to biodiversity; third parties' (and animals) safety, surface water flow, and air quality.

The discussion and impact assessment for each of the aspects mentioned above covers the operational phase only (including the bush clearing activities). As discussed in Section 7.1, the construction and decommission & closure phases will not be re-assessed.

The activities that are summarised in this chapter are linked to the descriptions provided in Sections 4 and 7 (Table 7-1).

Management and mitigation measures to address the identified impacts are discussed in this section and are included in more detail in the EMP report that is attached in Appendix F.

Both the criteria used to assess the impacts and the method of determining the significance of the impacts are outlined in Table 11: Criteria for assessing impacts

This method complies with the Environmental Impact Assessment Regulations: Environmental Management Act, 2007 (Government Gazette No. 4878) EIA regulations. Part A provides the approach for determining impact consequence (combining severity, spatial scale and duration) and impact significance (the overall rating of the impact). Impact consequence and significance are determined from Part B and C. The interpretation of the impact significance is given in Part D. Both mitigated and unmitigated scenarios are considered for each impact. This same impacts assessment methodology was also used in the 2008 EIA.

TABLE 11: CRITERIA FOR ASSESSING IMPACTS

PART A: DEFINITION AND CRITERIA		
Definition of SIGNIFICANCE	Significance = consequence x probability	
Definition of CONSEQUENCE	Consequence is a function of severity, spatial extent and duration	
Criteria for ranking of the SEVERITY/NATURE of environmental impacts	H	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action. Irreplaceable loss of resources.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints. Noticeable loss of resources.
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints. Limited loss of resources.
	L+	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
Criteria for ranking the DURATION of impacts	L	Quickly reversible. Less than the project life. Short term
	M	Reversible over time. Life of the project. Medium term
	H	Permanent. Beyond closure. Long term.
Criteria for ranking the SPATIAL SCALE of impacts	L	Localised - Within the site boundary.
	M	Fairly widespread – Beyond the site boundary. Local
	H	Widespread – Far beyond site boundary. Regional/ national

PART B: DETERMINING CONSEQUENCE

SEVERITY = L

DURATION		H	Medium	Medium	Medium
Long term		H	Medium	Medium	Medium
Medium term		M	Low	Low	Medium
Short term		L	Low	Low	Medium

SEVERITY = M

DURATION		H	Medium	High	High
Long term		H	Medium	High	High
Medium term		M	Medium	Medium	High
Short term		L	Low	Medium	Medium

SEVERITY = H

DURATION		H	High	High	High
Long term		H	High	High	High
Medium term		M	Medium	Medium	High
Short term		L	Medium	Medium	High

		L	M	H
		Localised Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/ national

SPATIAL SCALE

PART C: DETERMINING SIGNIFICANCE

PROBABILITY (of exposure to impacts)		H	Medium	Medium	High
Definite/ Continuous		H	Medium	Medium	High
Possible/ frequent		M	Medium	Medium	High
Unlikely/ seldom		L	Low	Low	Medium
			L	M	H

CONSEQUENCE

PART D: INTERPRETATION OF SIGNIFICANCE

Significance	Decision guideline
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

8.1 BIODIVERSITY

The section assesses the physical impacts on biodiversity associated with the current and proposed operations. The impact assessment and detailed baseline description of the 2008 EIA were used as a basis for this assessment together with additional specialist investigations and site observations by African Wilderness Restoration (Refer to Appendix Appendix E for the specialist biodiversity report).

8.1.1 ISSUE: PHYSICAL IMPACTS ON BIODIVERSITY

8.1.1.1 INTRODUCTION

With reference to Table 7-1, the bush clearing activities and open pits associated with the proposed silica sand pit and limestone quarry have the potential to impact on biodiversity in the broadest sense. In this regard, the discussion relates to the physical destruction of specific biodiversity areas, of linkages between biodiversity areas and of related species which are considered to be significant because of their status, and/or the role that they play in the ecosystem.

8.1.1.2 ASSESSMENT OF IMPACT

Severity

In the unmitigated scenario, the clearing of a total of 6 ha of land (4 ha for the proposed silica sand pit and 2 ha for the proposed limestone quarry) as well as other project related activities will result in the following impacts:

- Loss of habitats;
- Loss of shelter for smaller vertebrates, especially reptiles;
- Direct impacts to birds through removal of nest sites in plants and on the ground;
- Destruction of plants, including some of conservation concern;
- Animal mortality resulting from vehicles and machinery strikes as well as through clearing of land (i.e. slow moving animals and dormant invertebrates);
- Vehicle tracks damage the soil and inhibit root growth.
- Impacts on topsoil (i.e. damage / loss of topsoil).

The cement factory will use all excavated material, leaving an open pit at the quarry and a pit at the sand pit site. Due to the disturbance and the fact that water tends to collect here, large holes in a relatively flat area has a way of attracting exotic invasive plants (thus providing a nucleus for further dispersal) and becoming an ecological trap for other species. It is probably not possible to rehabilitate the limestone quarry (but see management and mitigation measures below and in the EMP), but rehabilitation of the sand pit is possible and indeed highly recommended. Successful restoration of its key ecological characteristics (relatively flat surface and a mix of trees in an open structure) will be a positive impact

In the unmitigated scenario, the severity is expected to be medium. With the implementation of mitigation measures, the severity can be reduced to low.

Duration

In the unmitigated scenario the loss of biodiversity and related functionality and subsequent colonisation of alien/invasive species is long term and will continue after the life of the operation. This is a high duration. In the mitigated scenario, the duration reduces to medium.

Spatial scale

Biodiversity processes are not confined to the project area. Due to ecosystem linkages and movement of animals, the loss of biodiversity has a medium rating.

Consequence

In the unmitigated scenario, the consequence is high. With mitigation, the consequence is low.

Probability

In the unmitigated scenario, the probability of the impact occurring is high. With the implementation of mitigation measures described in Section 8.1.1.3 the probability reduces to low.

Significance

The significance of this potential impact is medium in the unmitigated scenario and low in the mitigated scenario.

Tabulated summary of the assessed impact – physical destruction of biodiversity

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	H	M	H	M	M
Mitigated	L	M	M	L	L	L

8.1.1.3 CONCEPTUAL DESIGN OF MITIGATION MEASURES

A conceptual discussion of the mitigation measures is provided below. Detailed mitigation measures are included in the updated EMP (Appendix F).

Objective

The objective of the mitigation measures is to prevent, as far as is possible, the unacceptable loss of biodiversity and related functionality through physical disturbance.

Management and Mitigation measures

The measures presented in the 2008 EIA (included in the updated EMP – Appendix F) remain relevant.

The following additional actions are relevant:

- Keep footprint of project as small as possible and enforce the operational boundaries through highly visible signs and regulatory mechanisms such as fines or similar;
- One contradictory guideline: in order to prevent the pit from becoming too deep, the mining area of the sand pit should be enlarged somewhat and the slopes should be gradual to the outside

(this will facilitate rehabilitation). See EMP for additional recommendations and notes for more on this aspect.

- Raise awareness through awareness campaigns and training of key staff;
- Leave large *Peltophorum* trees standing;
- Rescue ground orchids and aloes;
- Strip topsoil (top 15 – 20 cm) before mining and stockpile in 2 m (maximum height) piles for restoration use after mining;
- Once mining is completed, replace topsoil on affected areas according to a comprehensive restoration plan;
- Compile and implement an alien invasive management plan to prevent colonisation of disturbed areas by invader species;
- Conduct annual measurements of basic soil variables such as pH, carbon, organic matter (the latter two should be on an upward trend over time or should at least not deviate from that of adjacent control areas);
- With regards to the proposed pit and quarry that will remain in perpetuity, a restoration plan should be compiled in consultation with a suitably qualified specialist. This plan should include monitoring in the post-operative phase to ascertain the effectiveness of the implementation of the restoration plan. If restoration is not possible, a biodiversity offset project should be investigated by Ohorongo Cement.

8.2 THIRD PARTIES' (AND ANIMALS) SAFETY

The information in this section was sourced from the 2008 EIA (CCA, 2008) as well as SLR's experience with similar projects.

8.2.1 ISSUE: DANGEROUS EXCAVATIONS

8.2.1.1 INTRODUCTION

Dangerous excavations and infrastructure include all structures into or off which third parties and animals can fall and be harmed.

8.2.1.2 ASSESSMENT OF IMPACT

Severity

In the unmitigated scenario, dangerous excavations include the pit and quarry. This infrastructure presents a potential risk of injury and/or death to both animals and third parties. This is a potential high severity. In the mitigated scenario the severity reduces to low as access control will be implemented at the pit and quarry sites to prevent and/or mitigate impacts.

Duration

In the context of this assessment, death or permanent injury is considered a long term, permanent impact. This is a high duration.

Spatial scale

Direct impacts associated with dangerous excavations will be located within the site boundary, with or without mitigation. The potential indirect impacts could extend beyond the site boundary to the families/communities to which the injured people and/or animals belong. This is a medium spatial scale.

Consequence

The consequence is high in both the unmitigated and mitigated scenarios.

Probability

In the unmitigated scenario, without management interventions, the probability of the impact occurring is expected to be medium due to the remoteness of the site. The mitigation measures focus on limiting access to third parties and animals which reduces the probability of the impact occurring to low.

Significance

In the unmitigated scenario, the significance of this potential impact is high. With the implementation of mitigation measures, the significance of this potential impact is medium because the probability of the potential impact occurring is reduced.

Tabulated summary of the assessed impact – dangerous excavations

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	H	H	M	H	M	H
Mitigated	L	H	M	H	L	M

8.2.1.3 CONCEPTUAL DESIGN OF MITIGATION MEASURES

A conceptual discussion of the mitigation measures is provided below. Detailed mitigation measures are included in the updated EMP (Appendix F).

Objective

The objective of the mitigation measures is to prevent physical harm to third parties and animals from potentially dangerous excavations. This can be achieved by implementing access control to the operational areas.

Management and Mitigation measures

The measures presented in the 2008 EIA (included in the updated EMP – Appendix F) remain relevant.

The following additional actions are relevant:

- The operational area will be fenced along the perimeter in order to control access by third parties and wildlife. The entrance gate will be staffed while mining activities are underway. During times when mining is not taking place, the entrance gate will be locked.

8.2.2 ISSUE: HAULING OF LIMESTONE NEAR HOUSES – 3RD PARTIES' SAFETY

8.2.2.1 INTRODUCTION

With reference to sections 4.2.7 and 6.3, as well as Figure 2, the proposed route for hauling the limestone would run immediately next to a farm house and a cattle outpost. The movement of the haul trucks right next to a household (with children) pose a safety risk during the 1 to 2 weeks per year when the material will be hauled to the factory. The assessment below (unmitigated scenario) is based on the (original) "proposed route", indicated with a dark blue line on Figure 2.

8.2.2.2 ASSESSMENT OF IMPACT

Severity

In the unmitigated scenario, the movement of the haul trucks, right next to a household with children presents a potential risk of injury and/or death to third parties. This is a potential high severity. In the mitigated scenario the severity reduces to low as an alternative route further away from the households will be followed (or the relocation of third parties), to prevent impacts.

By implementing management or mitigation measures to the (original) "proposed route", i.e. a fence between the houses and the road; enforcing speed limits, etc. is not considered a good option due to the fact that the possibility exists that children could still climb through the fence into the way of oncoming haul trucks, especially where it passes right next to their houses on a daily basis for more than a week.

Duration

In the context of this assessment, death or permanent injury is considered a long term, permanent impact. This is a high duration without mitigation. With mitigation, the impact is avoided.

Spatial scale

Direct impacts on third parties safety will be located within the site boundary. The potential indirect impacts could extend beyond the site boundary to the families/communities to which the injured people belong. This is a medium spatial scale in the unmitigated scenario.

Consequence

The consequence is high in the unmitigated scenario and low with mitigation.

Probability

In the unmitigated scenario, without management interventions, the probability of the impact occurring is expected to be high due to the (original) "proposed route" being right next to the farm house. The probability could be reduced to medium if management or mitigation measures to the (original) "proposed route", i.e. a fence between the houses and the road; enforcing speed limits, etc. are implemented. However, this would still mean a High a significant impact.

The probability (and impact significance) can therefore only be reduced to acceptable levels if the alternative access road (see light blue colour in Figure 2) is implemented and the third parties at the farm house and cattle outpost is relocated.

Significance

In the unmitigated scenario, the significance of this potential impact is high. With the implementation of mitigation measures, the significance of this potential impact is Low because the probability of the potential impact occurring is reduced.

Tabulated summary of the assessed impact – dangerous excavations

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	H	H	M	H	M	H
Mitigated	L	L	L	L	L	L

8.2.2.3 CONCEPTUAL DESIGN OF MITIGATION MEASURES

A conceptual discussion of the mitigation measures is provided below. Detailed mitigation measures are included in the updated EMP (Appendix F).

Objective

The objective of the mitigation measures is to prevent accident to third parties during the haulage of material on the farm roads.

Management and Mitigation measures

The measures presented in the 2008 EIA (included in the updated EMP – Appendix F) remain relevant.

The following additional actions are relevant:

- Preferred option – follow the alternative access route away from the 3rd parties.
- Another option would be to relocate the people living in the homestead and cattle post out with the impact zone. This could either be a permanent measure (i.e. build new homestead / cattle post out with the dust fallout zone) or a temporary measure during the time that mining activities at the limestone quarry are active (i.e. move people to alternate lodgings or new home for a few weeks). Prior to this option being followed, agreements need to be put in place with the people living in the homestead and cattle post, in liaising with the Ministry of Lands and resettlement. Ohorongo Cement must furthermore follow the International Finance Corporation's comprehensive guidelines on resettlement to ensure they end up no worse off than currently, and are preferably better off than they were before the project was undertaken.

8.3 SURFACE WATER

The information in this section was sourced from the 2008 EIA, additional desktop research and site observations.

8.3.1 ISSUE: ALTERATION OF THE HYDROLOGICAL REGIME

8.3.1.1 INTRODUCTION

With reference to Table 7-1, the proposed pit and quarry could cause a reduction to the downstream flow due to the reduction in runoff. This might lead to a loss of surface water flow volume as an important ecological driver.

8.3.1.2 ASSESSMENT OF IMPACT

Severity

With reference to Section 5.2, there is little distinct runoff in the area of the proposed silica sand pit, with few defined channels for flow and very shallow relief, resulting in most rainfall which falls either infiltrating, or becoming overland flow. The proposed limestone quarry is located at the foothills of a ridge (refer to Figure 2). There is a noticeable drainage line flowing from the ridge, past the proposed limestone quarry, where water would flow during rainfall events. Due to the limited footprint of the proposed pit and quarry and the fact that the limestone quarry would be located outside the above mentioned drainage line, the related area for runoff generation is small. As such, any reduction in runoff caused by this infrastructure will have a minor effect on downstream conditions (if at all).

Given the above discussion, the severity is low in both the unmitigated and the mitigated cases.

Duration

The duration of the potential for reduction in runoff will extend beyond mine closure as the pit and quarry will remain in perpetuity.

Spatial scale

The spatial scale might extend beyond the site boundary. Therefore it will have a medium influence in both the unmitigated and mitigated case.

Consequence

Based on the above assessment the consequence is medium in the both the unmitigated and mitigated cases.

Probability

In the unmitigated scenario, the probability of occurrence is medium as clean surface water run-off may collect in the proposed pit and quarry resulting in a loss of surface water flow.

With the implementation of mitigation measures, the probability decreases to low as clean surface water is diverted around the mining operations and allowed to continue as downstream run-off.

Significance

The significance of this potential impact is medium in the unmitigated scenario and low in the mitigated scenario.

Tabulated summary of the assessed impact – hydrological regime alterations

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	L	H	M	M	M	M
Mitigated	L	H	M	M	L	L

8.3.1.3 CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES

A conceptual discussion of the mitigation measures is provided below. Detailed mitigation measures are included in the updated EMP (Appendix F).

Objective

The objective of the mitigation measures is to prevent significant reductions in water flows and related loss of biodiversity and ecosystem functionality. This can be achieved by allowing (clean) surface water to continue as downstream runoff.

Management and Mitigation measures

The measures presented in the 2008 EIA (included in the updated EMP – Appendix F) remain relevant.

The following additional actions are relevant:

- Stormwater berms will be established upstream of the proposed infrastructure to divert clean surface water around the operational area.
- The limestone quarry will remain outside the 1:100 floodline of the drainage line.
- Flood protection measures will be established on the western boundary of the limestone quarry.

8.4 AIR QUALITY

The information in this section was sourced from the 2008 EIA (CCA, 2008) as well as SLR's experience with similar projects.

8.4.1 ISSUE: AIR POLLUTION

8.4.1.1 INTRODUCTION

With reference to Table 7-1, the proposed expansion could increase the potential impacts on air quality. The activities associated with mining of the pit and quarry have the potential to cause additional dust related impacts, particularly the access / haul road associated with the proposed limestone quarry where receptors reside within the zone of impact.

8.4.1.2 ASSESSMENT OF IMPACT

Severity

The main source of nuisance dust associated with the proposed expansion is the access / haul road for the limestone quarry. While the mining operations will create an increase in dust levels, there are no receptors in close proximity to the proposed pit and quarry and therefore there will be no impact, also taking into consideration the small scale of activities to be conducted over a relatively small time period.

In the unmitigated scenario, where the residents of the homestead and cattle post remain in their current lodgings; and the (original) "proposed route" is followed for hauling of the limestone, the severity of this impact is high. While the quarry will not be mined on a continuous basis (mining activities are expected to occur for 1-2 weeks a year), the impact during this time will be unacceptable.

In the mitigated scenario the severity reduces to low as an alternative route further away from the households (more than 1 km) will be followed (or third parties are relocated) and additional dust mitigation measures will be applied.

Duration

In both the unmitigated and mitigated scenarios, if human health impacts occur, these are potentially medium to long term in nature. This is a medium to high duration. Dust fallout impacts are of medium (nuisance) duration.

Spatial scale

Cumulative air quality impacts are expected to be limited to the site boundary (i.e. the proposed ML area). This is a low spatial scale.

Consequence

In the unmitigated scenario, the consequence is medium to high. With the implementation of mitigation measures, the consequence reduces to low as the severity is reduced.

Probability

The health and nuisance impact probability is linked to the probability of ambient concentrations exceeding acceptable limits at third party receptors. Given that acceptable limits relating to specifically nuisance impacts will most likely be exceeded in the unmitigated scenario, the probability is high. Given the small scale and limited duration of the limestone mining operations (1-2 weeks a year) the likelihood of health related impacts are possible in the unmitigated scenario. With mitigation the probability reduces to low.

Significance

In the unmitigated scenario, the significance of the potential impact is medium high. In the mitigated scenario, the significance reduces to low.

Tabulated summary of the assessed air quality impacts – dust fallout

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	H	M-H	L	M-H	H	M-H
Mitigated	L	M	L	L	L	L

8.4.1.3 CONCEPTUAL DESCRIPTION OF MITIGATION MEASURES

The conceptual discussion of the mitigation measures is provided below. Detailed mitigation measures are included in the updated EMP included in Appendix F.

Objective

The objective is to limit the Ohorongo Operation's contribution to air pollution impacts. All the management and mitigation measures included in the 2008 EIA Report and EMP remain relevant. These will not be repeated again in this report. They can however be found in the updated EMP included in Appendix F.

Management and Mitigation measures

The measures presented in the 2013 EIA (included in the updated EMP – Appendix F) remain relevant.

The following additional actions are relevant:

- Preferred option – follow the alternative access route away from the 3rd parties.
- Another option would be to relocate the people living in the homestead and cattle post out with the impact zone. This could either be a permanent measure (i.e. build new homestead / cattle post out with the dust fallout zone) or a temporary measure during the time that mining activities at the limestone quarry are active (i.e. move people to alternate lodgings or new home for a few weeks). Prior to this option being followed, agreements need to be put in place with the people living in the homestead and cattle post, in liaising with the Ministry of Lands and Resettlement. Ohorongo Cement must furthermore follow the International Finance Corporation's comprehensive guidelines on resettlement to ensure they end up no worse off than currently, and are preferably better off than they were before the project was undertaken.
- Dust suppression on haul roads through the spraying of water.
- Monitoring the fallout dust at the closets sensitive receptor (i.e. above mentioned farm house) during the (and after) the mining activities to determine if there is an increase in ambient fallout dust levels.

9. WAY FORWARD

9.1 WAY FORWARD FOR THE SCOPING REPORT

The way forward is as follows:

- MET review the Scoping Report and EMP and provide record of decision.

10. ENVIRONMENTAL IMPACT STATEMENT AND CONCLUSIONS

It is SLR's opinion that the environmental aspects and potential impacts relating to the proposed expansion have been successfully identified. The following environmental aspects and their overall cumulative impacts associated with the bigger Ohorongo Operation (taking the approved facilities/activities and the proposed expansion into consideration) have been re-assessed:

- Physical impacts on biodiversity due to bush clearing activities;
- Third party (and animals) safety:
 - Dangerous excavations as a result of the proposed pit and quarry;
 - Third party safety associated with the haulage of the limestone;
- Air quality impacts (i.e. dust);
- Surface water flow.

The assessment found that the proposed expansion present the potential for minimal additional risks and related impacts in the mitigated scenario. With regards to air quality; and third parties safety relating to the haulage of the limestone specifically, without mitigation in place the impacts related to people residing in close proximity to the (original) "proposed limestone quarry access / haul road" is likely to result in unacceptable impacts. With mitigation measures in place (i.e. an alterative route further away from the households will be followed, or third parties are relocated) the impacts reduce significantly to be similar to the mitigated impacts from the previous EIA.

Therefore, the overall contribution from the proposed expansion to the potential cumulative impacts associated with the approved operations is such that the original assessment findings remain largely unchanged albeit that some additional mitigation measures are required and have been detailed in the amended EMP.

SLR believes that a thorough assessment of the proposed expansion of mining activities has been achieved and that an environmental clearance certificate could be issued.

11. REFERENCES

Please refer to extensive list of references in the 2008 EIA Report.

African Wilderness Restoration. 2016. Ohorongo Cement Quarry and Sand Pit. Biodiversity baseline and impact assessment: final report for Ohorongo Cement quarry and sand pit.

Colin Christian & Associates. 2008. Environmental Impact Assessment and Management Plan for the Proposed Cement Manufacturing Plant and Quarry: Sargberg (Otavi/Tsumeb).

Google Earth. 2016.

SCHWENK Zement KG. 2016. Mining Plan for the proposed quarry and sand pit: Ma Foi 784 and Farm Hannover 549 (ELP No. 3371 and EPL No. 5166). Report No. 2016-003.

Pers Comms. 2016. John Kinahan - Archaeological specialist.

Fiona Bolton
(Report Author)

Werner Petrick
(Project Manager and Reviewer)

APPENDIX A: PROJECT TEAM CVS

CV for Werner Petrick

CV for Fiona Bolton

APPENDIX B: INFORMATION SHARING RECORD

- Background information documents, advertisements and site poster
- Newspaper Adverts
- Minutes with Stakeholders
- All comments received by email

APPENDIX C: IAP DATABASE

APPENDIX D: ISSUES AN RESPONSE REPORT

APPENDIX E: BIODIVERSITY SPECIALIST STUDY

APPENDIX F: UPDATED EMP



RECORD OF REPORT DISTRIBUTION

SLR Reference:	734.15017.00001
Title:	Scoping Report (Including Impact Assessment) for the Proposed Expansion to the Ohorongo Cement Operations
Report Number:	1
Proponent:	Ohorongo Cement (Pty) Ltd

Name	Entity	Copy No.	Date issued	Issuer
Mr. T. Nghitila	MET – Environmental Commissioner	1	Dec 2016	WP

COPYRIGHT

Copyright for these technical reports vests with SLR Consulting unless otherwise agreed to in writing. The reports may not be copied or transmitted in any form whatsoever to any person without the written permission of the Copyright Holder. This does not preclude the authorities' use of the report for consultation purposes or the applicant's use of the report for project-related purposes.