



63 Wessel Road, Rivonia, 2128 PO Box 2597, Rivonia, 2128 South Africa
Tel: +27 (0) 11 803 5726 Fax: +27 (0) 11 803 5745 Web: www.gcs-sa.biz

Nuclear 1: Geotechnical Characterisation Assessment Study for EIA: Peer Review

Report

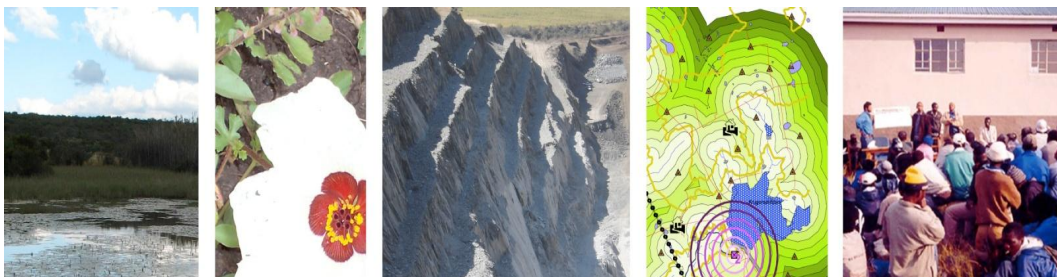
Version - 1

03 September 2015

GIBB (Pty) Ltd

GCS Project Number: 15-684R01

Client Reference: J31314 Nuclear 1 Peer Review



GCS (Pty) Ltd. Reg No: 2004/000765/07 Est. 1987

Offices: Durban Johannesburg Lusaka Ostrava Pretoria Windhoek

Directors: AC Johnstone (Managing) PF Labuschagne AWC Marais S Pilane (HR) W Sherriff (Financial)

Non-Executive Director: B Wilson-Jones

www.gcs-sa.biz

Nuclear 1: Geotechnical Characterisation Assessment study for EIA:
Peer Review

Report
Version - 1



03 September 2015

GIBB &GCS (Pty) Ltd

15-684R01

DOCUMENT ISSUE STATUS

Report Issue	Version 1		
GCS Reference Number	GCS Geotechnical Ref - 15-684R01		
Client Reference	J31314 Nuclear 1 Peer Review		
Title	Nuclear 1: Geotechnical Characterisation Assessment Study for EIA: Peer Review		
	Name	Signature	Date
Author	Nino Welland		September 2015
Document Reviewer	Jaco Nel		September 2015
Director	Alkie Marais		September 2015

LEGAL NOTICE

This report or any proportion thereof and any associated documentation remain the property of GCS until the mandator effects payment of all fees and disbursements due to GCS in terms of the GCS Conditions of Contract and Project Acceptance Form. Notwithstanding the aforesaid, any reproduction, duplication, copying, adaptation, editing, change, disclosure, publication, distribution, incorporation, modification, lending, transfer, sending, delivering, serving or broadcasting must be authorised in writing by GCS.

CONTENTS PAGE

1	INTRODUCTION	1
2	SCOPE OF WORK	1
3	REVIEWED DOCUMENT	1
4	COMMENTS AND RECOMMENDATIONS	1
4.1	FULFILMENT OF TERMS OF REFERENCE	2
4.2	REPORT OBJECTIVITY	2
4.3	TECHNICAL, SCIENTIFIC AND PROFESSIONAL CREDIBILITY	2
4.4	DEFENSIBILITY OF METHODOLOGY AND STUDY APPROACH.....	2
4.5	INFORMATION GAPS, OMISSIONS OR ERRORS	2
4.6	SENSIBILITY OF RECOMMENDATIONS AND PRESENTATION OF BEST OPTIONS	3
4.7	ALTERNATIVE VIEWPOINTS PRESENTATION AND CLARITY OF STATEMENT	3
4.8	ACCESSIBILITY OF STYLE OF REPORT TO NON-SPECIALISTS.....	3
4.9	MEETING OF NORMAL STANDARDS OF PROFESSIONAL PRACTICE AND COMPETENCE.....	3
5	CONCLUSIONS	4
6	REFERENCES	5

1 INTRODUCTION

GIBB (Pty) Ltd requested **GCS Geotechnical** to assist in the peer review of the geotechnical characterisation assessment study by SRK Consulting SA (Pty) Ltd for the Nuclear 1 Project. The GCS proposal, referenced 15-684 (Nuclear 1 Peer Review Geotech) L01 and dated 19 August 2015, was accepted in the GCS letter of appointment referenced 13-803, dated 24 August 2015.

2 SCOPE OF WORK

The scope of work (SOW) for the geotechnical characterisation assessment peer review study is as follows:

- Assess the document in terms of its fulfilment of the terms of reference
- Consider whether the report is entirely objective
- Consider whether the report is technically, scientifically and professionally credible
- Consider whether the method and study approach is defensible
- Identify whether there are any information gaps, omissions or errors
- Consider whether the recommendations presented are sensible and present the best options
- Consider whether there are alternative viewpoints around issues presented in the report and if these are clearly stated
- Consider whether the style of the report is written so as to make it accessible to non-specialists, technical jargon is explained and impacts are described using comparative analogies where necessary, and
- Report on whether normal standards of professional practice and competence have been met.

3 REVIEWED DOCUMENT

The document reviewed in this report has been prepared by SRK Consulting (Pty) Ltd in November 2014 and titled “Environmental Impact Assessment for a Proposed Nuclear Power Station (Nuclear 1) and Associated Infrastructure: Geotechnical Characterisation Assessment Study”. The report was presented to GIBB on behalf of Eskom Holdings Ltd.

4 COMMENTS AND RECOMMENDATIONS

The comments and recommendations by GCS Geotechnical in this peer review is divided into the following sub-sections:

4.1 Fulfilment of Terms of Reference (ToR)

- The overall report fulfils the intended purpose.

4.2 Report Objectivity

- The report is largely objective. Areas which need attention are highlighted below in the following sections.

4.3 Technical, Scientific and Professional Credibility

- The report is well constructed with a good reference section to external data sources.

4.4 Defensibility of Methodology and Study Approach

- In general the methodology and study approach are defensible.

4.5 Information Gaps, Omissions or Errors

- The use of detailed technical information (such as geology and structural information) has not been linked to a reference in the body of the report.
- Units have been omitted on the vertical and horizontal axes of each geological cross section.
- Geological map overlays at each site were not included.
- All plans (Figures 1.1, 2.4, 2.8 and 2.12) should have at least some coordination grid and scale.
- A comment of the quality and suitability of the overburden material for re-use as a construction material has not been included.
- The geological cross sections A and B at each site have not been shown on the environmental sensitivity plans.
- An assessment of the quality and location of nearby construction material sources has not been included.

- The well documented geotechnical conditions and as-built construction details of Koeberg Power Station have not been summarised and included for the Duynfontein site comparison (Barker, 1980 and Brink, 1981, Vol 2, pp 124-126).

4.6 Sensibility of Recommendations and Presentation of Best Options

- The recommendations are generally considered sensible.
- However, alternative foundation options have not been presented or explored.
- Koeberg power station adjacent to the Duynfontein site was excavated to expose bedrock and then backfilled with 6m soil-cement mattress. The overburden material quality requires further assessment for possible similar re-use to minimise environmental impact of spoil disposal.

4.7 Alternative Viewpoints Presentation and Clarity of Statement

- Some alternative viewpoints are presented and clarified in the report.
- However, there appears to be confusion between the optimal positioning of the site close to the sea (rather than 500m inland) to reduce bulk earthworks and mitigation against tsunamis.
- Figure 2.4 shows geological transition areas as “No-go zones of seismic hazard”. This has not been explained in the report.

4.8 Accessibility of Style of Report to Non-Specialists

- Technical jargon was generally explained and the report is understandable to non-technical readers.
- A comprehensive glossary of terms and abbreviations has been included.

4.9 Meeting of Normal Standards of Professional Practice and Competence

- The report meets the normal standards of professional practice and competence. Areas that require improvement have been indicated above in the relevant sections.

5 CONCLUSIONS

The areas that need attention include the following:

- The geological cross sections need units to be defined on the axes.
- The geological sections would be clearer with colour differentiation between the lithologies.
- Additional graphical representation of bedrock dip and dip direction on the geological cross sections and plans would emphasise potential areas of rock slope instability with respect to envisaged bulk earthworks cuts.
- Figures 1.1, 2.4, 2.8 and 2.12 would benefit from a scale and some sort of coordinated reference grid so that the extent of the 1ha development area can be visualised.
- The addition of the approximate coordinates of each candidate site would assist in the rapid location of each site on Google Earth and published geological maps.
- This peer review is in agreement with the assumption of foundations to bedrock but the further assumption of large bulk excavations to expose bedrock for spread foundations may be limiting. Alternative foundation options such as piling should be explored which may or may not attach their own environmental risk.
- Two positions at each site have been considered, one located adjacent to the sea and one located 500m inland (presumably to mitigate tsunami events). It has not been explained how the position adjacent to the sea will be rendered safe from a tsunami event.
- Bibliography list should be either alphabetical or chronological for ease of reference.
- Reference to appropriate geological maps and geological overlays to the environmental sensitivity plans would have assisted the review process and created a more complete report.
- A summary of the properties of the proposed spoil material would assist the determination of the environmental risk. An assessment of the possible re-use of the overburden material is essential.
- The location and assessment of nearby construction material sources at each site has not been included.

6 REFERENCES

Barker, OB (1980): Palaeo-proof from the paddock. Nuclear Active, January 1980, pp 1-8.

Brink, ABA (1981): Engineering Geology of Southern Africa: Rocks of 2000 to 300 Million Years in Age. Vol 2. Building Publications Pretoria.

SRK Consulting (Pty) Ltd (2014): Environmental Impact Assessment for a Proposed Nuclear Power Station (Nuclear 1) and Associated Infrastructure: Geotechnical Characterisation Assessment Study.