

**The development of a Dolomite Risk Management Strategy for the
Tlokwe City Council**

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Abstract

Development on dolomite poses a risk due to the possible formation of instability features such as sinkholes. Most of these features are however man-induced, and the risk associated with development on dolomitic areas can be mitigated through correct management. Therefore, since the Tlokwe City Council is accountable for safe development within its jurisdiction, a Dolomite Risk Management Strategy (DRMS) should be put in place.

There are several factors that contribute to the risk for development on dolomite. These factors can be categorised into two groups that should be considered during the hazard identification process, namely physical factors that consists of geology, geohydrology and geotechnical, and anthropogenic factors that consists of existing infrastructure and development, land use planning, as well as social structure and awareness.

These factors are assessed by means of a risk assessment in order to obtain a disaster risk score for different areas within the study area. Based on this score, priority focus areas can be identified, mainly for critically important further research before any development can be allowed or mitigation measures implemented.

Once these research activities are completed, a DRMS can be compiled based on the guidelines set by SANS 1936, which will promote the safety of people and property when further development on dolomite takes place. Urgent and interim mitigation measures are proposed to manage the risk during further research activities.

Opsomming

Daar is 'n risiko wanneer enige ontwikkeling op dolomiet gedoen word omdat onstabieleit soos bv. sinkgate kan ontstaan. Die natuurlike onstabieleit van dolomitiese gesteentes word bykans deurgaans vererger deur menslike aktiwiteite en die korrekte bestuur van sodanige aktiwiteite is daarom noodsaaklik. Omdat die Tlokwe Stadsraad verantwoordelik is vir veilige stedelike ontwikkeling binne hulle munisipale area, moet daar 'n Dolomiet Risiko Bestuurstrategie (DRBS) opgestel word.

Daar is 'n aantal faktore wat bydra tot die risiko van stedelike ontwikkeling op dolomitise areas. Hierdie faktore kan in twee groepe ingedeel word wat oorweeg moet word gedurende die identifiseringsproses. Die een groep is fisiese faktore, wat geologie, gehidrologie en geotegnies insluit. Die ander groep is mensgemaakte faktore soos bestaande ontwikkeling en infrastruktuur, grondgebruikbeplanning, asook sosiale strukture en bewusmaking.

Hierdie ondersoek handel verder oor die kwantifisering van die faktore wat bydra tot die risiko, gevolg deur 'n risiko analise van die spesifieke studiegebied. Dit behels verder die afbakening van prioriteitsfokusareas wat verdere ondersoek verg voordat daar met enige ontwikkeling of voorsorgmaatreëls voortgegaan sal kan word en kulmineer in die ontwikkeling van 'n DRBS (gebasseer op die riglyne soos vervat in SANS 1936) vir die stadsraad van Tlokwe waarmee alle toekomstige ontwikkeling op dolomitiese gebiede effektief bestuur sal kan word. 'n Aantal interm maatreëls word ten slotte voorgestel wat gevolg moet word totdat alle navorsing oor die studiegebied voltooi is.

Keywords

Dolomite risk management strategy, dolomite stability, dolomite hazard, dolomite risk management process, dolomite stability assessment, physical factors, anthropogenic factors.

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List of Abbreviations	
Abbreviation	Description
AGES	Africa Geo-Environmental Engineering and Science
CGS	Council for Geoscience
DFA	Development Facilitation Act
DMA	Disaster Management Act
DRBS	Dolomiet Risiko Bestuurstrategie
DRMS	Dolomite Risk Management Strategy
DWA	Department of Water Affairs
EC	Electrical Connductivity
EIA	Environmental Impact Assessment
GMA	Groundwater Management Area
IDP	Integrated Development Plan
mbgl	Meters below ground level
NEMA	The National Environmental Management Act
NEM: WA	National Environmental: Management Waste Act
NGA	National Groundwater Archive
NHBRC	National Home Builders Registration Council
NWA	National Water Act
OMV	Oranje Mynbou en Vervoer
PAIA	The Promotion of Access to Information Act
SABS	South Africa Bureau of Standards
SANS	South African National Standards
SDF	Spatial Development Framework
SPLUMB	The Spatial Planning Land Use Management Bill
TCC	Tlokwe City Council
UNISDR	United Nations International Strategy for Disaster Reduction
WCED	World Commission on Environment and Development
WULA	Water Use License Applications
ZAR	Zuid-Afrikaansche Republiek