



Council for Geoscience

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VGIconsult
P.O. Box 604
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Dear Sir,

GFSH-2, PHASE 2: INFILL GEOTECHNICAL INVESTIGATIONS: IRENE EXTENSION 70 INCLUDING THE ZONE 2 STANDS

Your office has submitted the report "Report VGI 14063R: GFSH – 2 Infill Geotechnical Investigations: Irene Extension 70, Including the Zone 2 Stands", dated October 2007 to Dr RJ Kleywegt requesting comment. You require a review and comments on the findings, conclusions and recommendations, related to dolomite aspects of the abovementioned report. Changes were made to the original report by Messrs VGIconsult based on comments, suggestions and recommendations made by Dr RJ Kleywegt directly to your Dr D Buttrick and the consensus reached regarding the issues.

The proposed Irene Extension 70 is situated in the Centurion south of the N1 highway and about 1,5 km east-northeast of Irene. The area was originally investigated and reported on in Intraconsult report IR523F dated July 2003. The largest portion of the presently proposed Irene Extension 70 (Dolomite Stability Zone 1- DSZ 1) was assigned to Inherent Risk Class 1 and the DSZ 2 was considered to be of transitional nature on the basis of the gravity data and provisionally characterized as Inherent Risk Class 5 (6). A reassessment of the DSZ 2 land for possible residential use was requested and the necessary further geological work has been undertaken.

A further 15, 60-metre deep, investigatory boreholes were drilled in the former DSZ 2 area and the chip samples examined and assessed. Excluding a relatively thin horizon of

colluvium, generally less than 5m thick, all the boreholes intercepted combination of shales and chert, which were ascribed to possibly Karoo, reworked Karoo or post-Eccles Formation, Leeuwenkloof Formation and below these, a succession almost indistinguishable there from (due to the destructive drilling process), of chert residuum to 60m, the maximum depth that was drilled. All these materials appeared, from the drilling data, to be reasonably uniform and competent although the internal drainage characteristics would be better for the upper sediments relative to those of the residuum. Based on the interpreted assessment of the contact between these upper and lower sediments there could be some substantial variation in thickness of the upper less permeable sediments. This has influenced the inherent risk class characterisation of the former DSZ 2 land, and the change from the previous Inherent Risk Class 1, for the largest portion of the land, to the Inherent Risk Class 4(1) for water ingress.

The proposed Irene Extension 70 is situated in the Fountains East Dolomitic Groundwater Compartment which has a water level of about 1380mamsl. Based on the ground elevation range across the site of 1484m to 1496mamsl the depth to the water table is estimated to range from 104m to 116m. This is of great depth and the likelihood of substantial thickness(es) of highly leached dolomite residuum across the site is small. In any event, because the nature and thickness of any such materials below the water table was not tested - it would probably be a major undertaking - a more definitive statement about possible effects of major groundwater level draw down cannot be made and, consequently, an element of conservatism needs to be built into the relevant Inherent Risk Class characterization. Nevertheless, approval of substantial groundwater level draw down can not be contemplated because of the enormous investment in existing residential, commercial and industrial developments in Centurion. A dewatering inherent risk class assessment of Inherent Risk Class 4(1) is consequently supported.

The combined Inherent Risk Class 4/1/1(4) recommended in Chapter 8 (Conclusions) is supported as are the recommendations contained in Chapter 9 (Recommendations) and Chapter 10 and all the former relevant recommendations contained in Intraconsult report IR523F and the Council for Geoscience's correspondence and any which the NHBRC may have made.

In order to ensure that the re-recommendations are adequately addressed it is recommended that Messrs VGIconsult be retained up to the stage that the local authority takes over responsibility for the operation and maintenance of the development, that is envisaged, within its own broader management responsibility. It is essential, therefore, that it is established that the local authority is willing, and able, to take on this additional responsibility.

All of this will require them (Messrs VGIconsult) to liaise with, and where necessary, guide professionals such as planners, civil, structural and other engineers, contractors and also

officials of the local authority to ensure that the development will be in accordance with their interpretation of the subsurface geology and risk.

A dolomite completion report is recommended to be drawn up, as recommended in Chapter 10 to outline the additional conclusions - especially as regards the possibility of palaeo sinkholes being present on the site - and recommendations based on the findings 'post' the present report.

Interaction with the Council for Geoscience in these ongoing processes is also recommended.

Yours sincerely

A handwritten signature in black ink, appearing to read 'G.J. Heath', written in a cursive style.

G.J. HEATH
ENGINEERING GEOSCIENCES