

TECHNICAL REPORT NO. 5

Mapping of Groundwater Vulnerability and Hazards to Groundwater in the Karak-Lajjun Area

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Summary

Development in the Karak – Lajjun area is presently rather limited. The area, however, provides excellent opportunity for development, especially in terms of infrastructure and water resources availability. In this regard, the presented groundwater vulnerability map may serve as a tool for an improved landuse planning and for an optimal development and protection and management of the groundwater resources.

Groundwater resources are vulnerable especially in the area around and south of Al Lajjun. Since this is also a prominent area for groundwater resources development, protection measures should focus on this area. Here, the risk of groundwater contamination arises from a solid and a liquid waste disposal, a sewage treatment plant and chicken farms. The design of some of these sites is relatively poor and therefore a number of measures are proposed to reduce the risk of groundwater contamination. In case the mining of oilshale will be regarded as feasible in the future, the same area may also be the likely location for an oilshale mine and processing plant. In case such a plan is realized, it is proposed to select the optimal location for such a mine and processing plant based on the presented groundwater vulnerability map. A more detailed investigation of the suitability of the envisaged site, however, is indispensable. It is also suggested to conduct an environmental impact assessment (EIA) before approving the final location. This study should focus on how to operate the facility and how to dispose of the mine tailings without contaminating the groundwater and surface water resources.

The groundwater vulnerability map should be used for future landuse decisions, e.g. for the preliminary selection of sites for potentially hazardous activities, such as waste disposals, industrial and commercial sites, etc. In any such case, however, it is recommended to conduct more detailed site investigations before a final decision about the location and design of such a site is taken.

The groundwater vulnerability map may also help concerning environmental impact assessments and selecting groundwater monitoring well locations. Concerning the latter issue, two such locations are proposed for two potential hazards to groundwater.

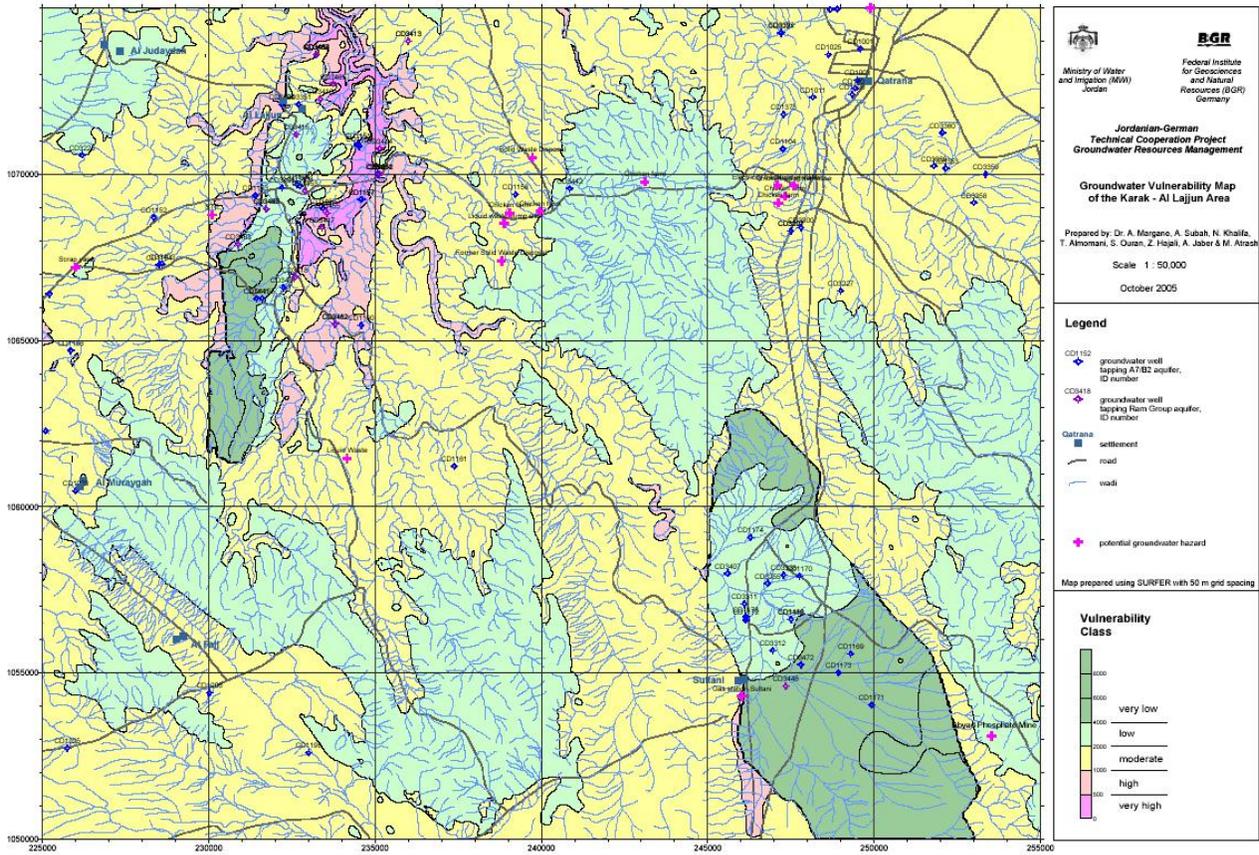


Figure 71: Groundwater Vulnerability Map