

# Geophysical and Environmental Evaluation of Wadi Hanifah - Saudi Arabia

**A. O. Al-Jasser<sup>1</sup> & S. Mogren<sup>2</sup>**

<sup>1</sup> Associate Professor, Civil Engineering Department, College of Engineering, King Saud University, PO Box 800, Riyadh 11421, Saudi Arabia.

[ajasser@ksu.edu.sa](mailto:ajasser@ksu.edu.sa)

<sup>2</sup> Assistant Professor, Geology & Geophysics Department, College of Sciences, King Saud University, PO Box 2455, Riyadh 11451, Saudi Arabia.

[smogren@ksu.edu.sa](mailto:smogren@ksu.edu.sa)

This study aimed to evaluate the geophysical and environmental of the Wadi Hanifah area. The Wadi is located in the central Arabian Peninsula, running through Riyadh city from northwest to southeast. Its has a distinguished length, approximately 150 km. Wadi Hanifah is located in the sedimentary cover rock and considered as the main dry valley of Riyadh area. Its has a unique natural features in the arid central Saudi Arabia as it forms a natural drainage course for surface water for a very large area, fed by a number of tributaries. Its entire drainage run-off area covers approximately 4,000 square kilometers. Subsurface structures have affected hydrogeological trend of the study area, where there are two sets of joints at which main Wadi and sub Wadis make their erosion which have caused the Wadi floor rocks to be fractured and to act as a good shallow water reservoir sharing with Wadi alluvial sediments. These faults and fractures are extended to subsurface rocks leading to increasing of electrical conductivity of these rocks at areas of fracturing extension. Ground water management programs as well as tertiary treated wastewater disposed from Riyadh city are the main sources for the permanent flow in certain part of Wadi Hanifah. Water quality of the Wadi were assessed based on its physiochemical and biological characteristics of composite samples collected along the Wadi. Suitability of the water for agricultural irrigation were determined according to the recent Saudi Standards for irrigation. The results showed, in general, unacceptable level of contaminates. More strict control on discharge policy must be practiced.