

## **Advanced Aspects of Groundwater Flow and 3D Geologic Models in the Oil Shale Basins, Jordan**

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### **Abstract**

Oil-shale deposits have been identified in the Jordan Basins. Geophysical and Geological Investigations have been conducted on the Oil Shale basins. The availability, natural dynamics and interaction between surface water and groundwater resources are understood and will be important to understanding integrated hydrologic impacts from development of oil shale resources on the Oil Shale Basins. Development will require groundwater to access and process oil shale deposits. The removal of this water and subsequent disposal of it will likely impact both groundwater and surface water.

Understanding these impacts requires detailed knowledge of both the surface hydrology and subsurface hydrogeology of the basin system and their interaction. Natural ground water recharge within the basin aquifer is derived from precipitation whereas ground-water discharge is to either ephemeral or, perennial streams. The geohydrologic units considered in these models in geologic Formations that are unconfined and confined units. These deposits directly influence flows between surface water and groundwater. Hydraulic conductivity of the basin aquifer is related to lithology and the degree of fracturing. This presentation discusses development of a conceptual model, and inputs necessary to construct a fully integrated surface water-groundwater hydrologic model of existing conditions of the Oil Shale Basins: El Lajjun and Attarat.

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