

DEVELOPMENT – EGYPT

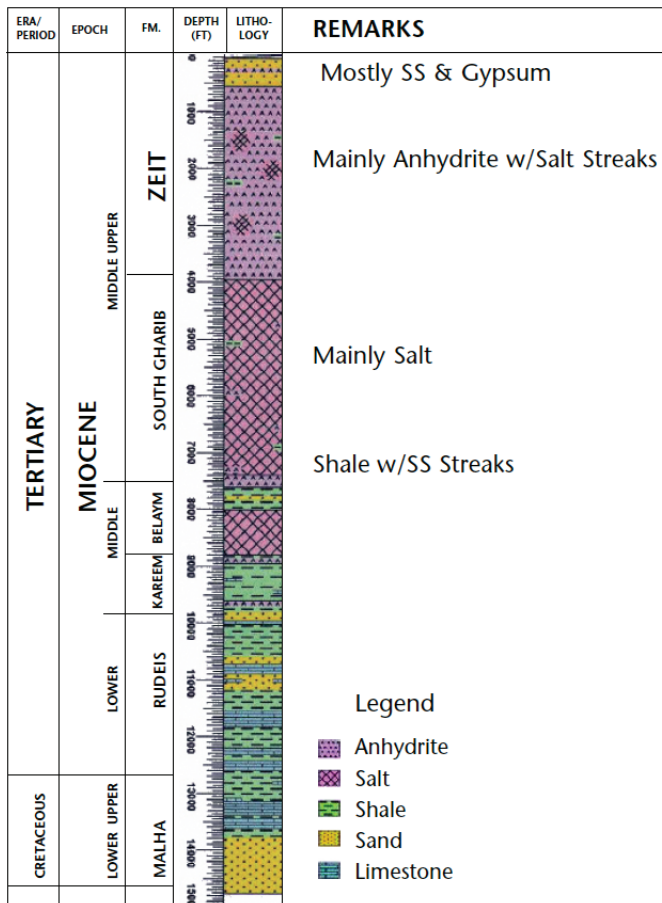


Figure 1: Stratigraphic column of the West Gebel El Zeit field shows massive salt.

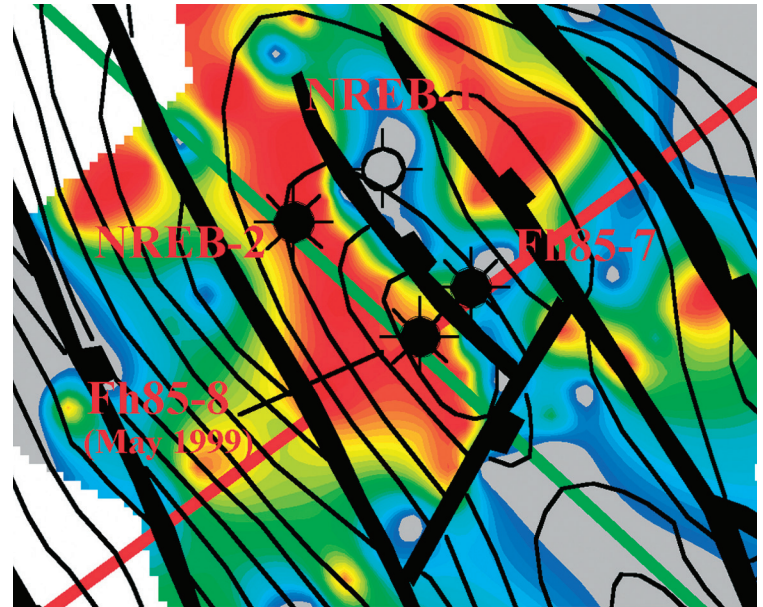


Figure 2: Top of Kareem formation structure merged with the AGI Survey oil-like hydrocarbon probability map, showing new well FH85-8, initial potential 800 b/d.

Survey Summary

- Egypt – Development
- Producing oil field
- Detect microseepage through massive salt
- 150 AGI passive samplers installed
- Sample spacing - 250 to 250 m regular grid along seismic lines
- Microseepage of hydrocarbons through more than 3,000 m of evaporitic formations detected
- One economic oil well drilled as a result of the AGI Survey

Introduction

The survey area is located in the West Gebel El Zeit development lease in eastern Egypt. Producing horizons are the lower to middle Tertiary Kareem & Rudeis formations, about 3,500 m deep. Goal of the survey was to demonstrate oil reservoir detection through massive evaporite sequences and to develop the operating oilfield.

AGI Survey

150 samplers were collected from a regular grid spaced 250 by 500 m along seismic lines, covering an area of 25 km². For statistical modeling purposes additional samples were collected at existing wells known to be dry wells or producers of oil. Sample analysis was performed using gas chromatography and mass selective detection. An analysis for more than 80 target compounds was performed. Compounds observed included N-alkanes ranging from ethane through octadecane. By comparing the field samples against the modeled oil signatures, the similarities of each sample's signature to the local oil were established in terms of probability. The probabilities were contoured revealing surface geochemical anomalies.

Survey Results

The field survey results identified anomalous features with a general northwest-southeast trend, parallel to the faulting direction in the study area (Figure 2). The main petroliferous block identified by the surface geochemistry is located at the center of the survey. The structure at the top of the Kareem formation is well represented in this block and encompasses two oil-bearing wells, NREB-2 and Fh85-8. The latter well, drilled after the AGI Survey, produced oil at a rate of 800 b/d.

The results of the AGI Survey indicate clearly that the sealing capabilities of thick sequences of salt and anhydrite are insufficient to prevent hydrocarbon microseepage to the surface from deep petroleum reserves.