Overview: Enefit

Enefit is the largest oil shale processing company in the world, having converted 15 million tons of oil shale per year to energy. Enefit owns 60% of the total world oil shale power plants. Total oil shale production is 2,900 megawatts. Enefit also operates the most advanced oil shale mining and extraction technology. In 2010, Enefit mined in a single mine 5 million tonnes of oil shale, produced 520 million megawatt-hours of power and 200 million tonnes of shale oil.

Enefit is developing two parallel oil shale projects in Jordan:
- A Shale Oil Production Plant producing around 38,000 bbl/d
- An Oil Shale Fuel Power Plant with capacity of 600-1500MW

The scope of works includes a comprehensive geological and hydrogeological survey of the Attarat Um Ghudran oil shale deposit. The key goal for this study is to understand the oil shale deposit in detail for further developing activities.

Enefit development projects for oil and power production

Lithology and classification of the oil shale seam

GS in Jordan was previously described as bituminous chalky marl/limestone. Our studies revealed that this classification is not detailed and correct enough to describe the Attarat Oil seam. Therefore:
- Organic material is still bound to kerogen and no bituminous material has been released
- clay minerals composition is too low for marl or mudstone
- Organical material is still bound to kerogen and no bituminous material has been released
- Organics in Jordan are much less than previously described

New system that was put forward by Sh. A. Alassa and M. M. Shorba is based on the J.C. Hunter (1987) classification that separates the Jordanian oil shales into four main groups:

I Sedimentary rocks of the oil shale seam

II Diagenetic concretions/layers of the oil shale seam

Geological drilling campaign

Geological drillings were targeting 3 aquifers at the depths of ~425 m, ~700 m and ~975 m. After the drilling and well development program was started in order to determine the water yields of the aquifers.

Hydrogeological drillings

Hydrogeological drilling campaign was targeting 3 aquifers at the depths of ~425 m, ~700 m and ~975 m. After the drilling and well development program was started in order to determine the water yields of the aquifers.

Detailed macroscopic description of the oil shale seams is the layered structure of the Attarat OS, the information is used in the later geological correlation and modelling.

The diagenetic field drilling campaign was important for the paleo-oil shale deposits and the complex and widespread oil in the Attarat OS seam.

The main outcomes of the oil shale seam stratigraphical studies are:

1) Detailed logging main outcome is used in the stratigraphical correlation of the Attarat OS seam.
2) Refined formation/subformation correlation and stratigraphical correlation of the oil shale sequences.
3) Chemical interpretation and correlation of oil shale sequences.
4) Detailed stratigraphical core material in many details and use the compiled logs for stratigraphical correlation of the Attarat OS seam.
5) Hard monolite 0.5-1.5 m thick dolomitic sedimentary mudstone/grainstone rock mass.
6) Small 1-5 mm diagenetic apatite concretions found in some layers of the Attarat OS seam that serve as the marker horizons for correlation studies.
7) Small 1-5 mm diagenetic apatite concretions found in some layers of the Attarat OS seam that serve as the marker horizons for correlation studies.
8) Small ~1-50 cm thick very hard silicified limestone concretions found in several layers of the Attarat OS seam that serve as the marker horizons for correlation studies.
9) Small 1-5 mm diagenetic silicate concretions found in some layers of the Attarat OS seam that serve as the marker horizons for correlation studies.
10) Rare ~1-50 cm thick diatomaceous limestone in some layers of the Attarat OS seam.
11) Weathered OS and OB (HW) the last serving as main markers in the correlation process were defined.
12) As a result a total of 8 oil shale layers and 3 dolomite interlayers were defined.