

## Sukhaybarat Gold Mine

### Location:

The Sukhaybarat Gold Mine is located 550km northwest of Riyadh and 250km northwest of Mahd Ad Dahab in the Nuqrah-As Safra area. This remote region is the center of historical Gold and Copper workings, which were discovered in the 1930's.

The Sukhaybarat is just one of a number of Gold occurrences in this area, where the precious metal is found in both diorite and sedimentary formations. Modern development of the deposit began in 1986 with a feasibility study instigated by the Saudi Company for Precious Metals (SCPM), a joint venture between Petromin and the Swedish Mining Company, Boliden. In 1991, this partnership began open pit mining of the reserves.



Location map of Sukhaybarat Gold Mine

The CIL plant will continue to operate until 2006 processing stockpiled ore, while the HL operation will cease production in 2003, once the rinsing and cleansing of the heaps are completed. Production from this plant will decrease to approximately 22,000 ounces in 2003 due to the lower grade of ore that will be treated. The plant is also planned to handle loaded carbon from the new Bulghah Gold Mine, utilizing the spare capacity of the stripping, electro winning, and smelting equipment.

**Resources:** 2.5 Mt grading around 2.0 g/t Au.

**Process Route:** Carbon in Leach (CIL) and Heap Leach (HL).

**Production :** 1,800 tons per day with a recovery of 90%

## Mineralization

The Sukhaybarat Silsilah district contains over 40 Gold occurrences where Silver is subordinate. These are generally installed on shear-zones and hosted, either by Murdama volcano-sediments, or by Post Murdama Intrusives of the Idah suite. Some Cu-Mo Porphyries also occur in this context, as does the Mibari Cu-Au prospect (E. Jaques, A. Al Jehani 1998) or the zoned Silsilah greisen intrusive with tin mineralization.

## Gold mineralization in shear zones

Gold mineralization in shear zones is found in extensional fractures related to shear faulting. The host rock is either an intrusive whose emplacement was related to the structural movement, or a meta-sedimentary rock that was affected by the thermal halo around the intrusion. Biotite Hornfels occurs up to 100m distant from the intrusion and is marked by a negative ground magnetic anomaly.



Location map of Sukhaybarat Gold Mine at the Arabian Shield

### **Gold mineralization in intrusive rocks**

The Sukhaybarat Mine was discovered as the result of a systematic re-evaluation of old workings. The mine, which is now almost worked out, will have produced 21 tons of Gold from ore grading on average 2.5 g/t Au.

The Gold occurs in Enechelon Fractures filled with Quartz with Arsenopyrite and Pyrite, and traces of Chalcopyrite and Galena. Alteration with Actinolite, Pyrite, Sericite, Chlorite, Arsenopyrite, and Carbonates affects the walls over 30 - 40 cm. Gold grades in the walls are significant at 0.5 - 1 g/t. Geochemically, the alteration stands out through a clear increase in  $K_2O$ ,  $CaO$ ,  $MgO$ , and  $CO_2$ , and a decrease in  $Na_2O$ .

### **Exploration perspectives**

The district has a good potential for Shear Zone Type mineralization related to young intrusions as well as for porphyry / epithermal deposits. Systematic regional geochemical sampling over a regular grid as well as ground geophysics (gravimetry, magnetism) should provide a clearer idea of the potential of this district, which is marked by a high density of ancient workings.



Sukhaybarat Au Mine



Processing Mill at Sukhaybarat Gold Mine

## **Mining**

The Sukhaybarat is an open pit Gold Mine. Modern operation started 1991 but area has ancient mining archeological sites (est. 1,000 to 3,000 years old). Two such discreet sites are listed as presented in the main locality line (Sukhaybarat al Gharbiyah [also known as: Shukhaybirat al Gharbiyah & Shukhaybarat al Gharbiyah]; and Sukhaybarat ash Sharqiyah [also known as: Shukhaybirat ash Sharqiyah, Shukhaybarat ash Sharqiyah & Suqabrah]).

These two ancient sites are within 4 or 5km apart of each other (25 28', 41 56' vs. 25 28', 41 59'). Owned by Saudi Precious Metals Co, the company produced **16,681kg** of Gold between 1991 - 1998

The ore is in two connected systems of shallow, dipping Quartz Veins and Veinlets of the Nabitah Fault System, hosted in altered stockwork zones and Granodiorite / Tonalite intrusion and adjacent layered Volcanics.