

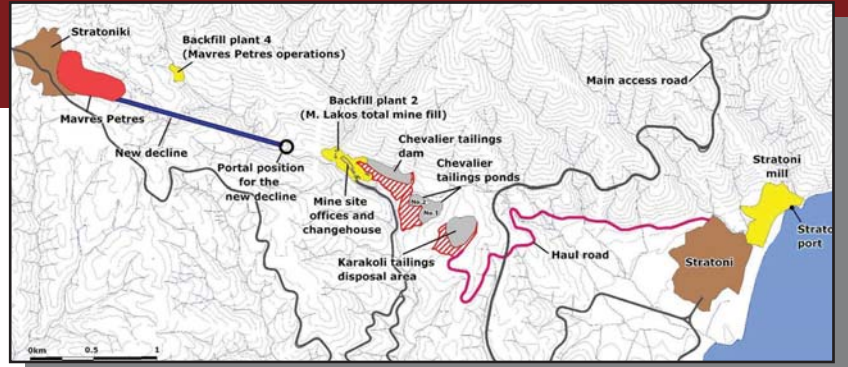


Factsheet providing a brief summary on one of the model sites in ProMine

Stratoni (Greece)

October 2010

Stratoni is the model site for the nano-silica particles product which can be used for the production of high-performance concrete. In this process, highly concentrated sulphuric acid is reacted with olivine to produce silica.



Stratoni Operation, Hellas Gold S.A.

Hellas Gold S.A. operates the Stratoni Mine, a massive sulphide lead-zinc-silver deposit in the Kassandra Mines area of Northern Greece. It is located in the Chalkidiki peninsula, about 100 km from Thessaloniki and 4 km from the coastal town of Stratoni. The Stratoni Mining area consists of two deposits: Mavres Petres and Madem Lakkos. The latter mine is exhausted and was closed in 2002, current active mining is restricted to the Mavres Petres body. In addition to the mine infrastructure and tailings facilities, there is a mill and flotation plant, offices and a laboratory together with a port loading facility for vessels, all located on the coast at Stratoni. The mine produces high quality lead-silver and zinc sulphide concentrates.

Current Situation

Reserves at the Mavres Petres mine are expected to last for another six years. The mine is operated using the conventional drift and fill method. This utilizes a series of tunnels (drifts) mined through the ore zone which are then filled with cement. The extracted ore material is taken to the flotation plant outside Stratoni village and separated into its respective concentrates, which account for one fourth of the total extracted material.



The waste disposal scheme is based on the use of filter presses for dewatering fine tailings to produce dry cake for surface storage at significantly reduced volumes. All mine water is treated for recycling and reuse in a treatment plant located by the sea. The water flow rate from the mine is decreasing with time, while conversely the pH is increasing. This leads to a reduction of water arriving at the water treatment plant and a lowering of the heavy metal content.

Ancient mining at Stratoni peaked during the time of Philip II and Alexander the Great, at which time silver and gold financed their conquests of the then known world during the period 350 to 300 BC. The volumes of ancient slag suggest that about 1 million ton of ore were extracted during this period. The Stratoni mine continued production through the Roman, Byzantine and Turkish periods.

ProMine Model Site - Greece

More information can be found on promine.gtk.fi

Expected Outcome from ProMine Research

To create a product that reduces the need for raw material in the concrete industry, and is produced from the utilisation of two waste streams: concentrated acid from the processing of the nearby Olympias auriferous pyrite and Skouries copper-gold concentrates at the metal plant planned to be constructed in the Stratoni mining area and olivine waste rock from the Gerakini magnesite mine.



Some facts

Mine Mavres Petres

Owner Hellas Gold S.A. (95%)

Start of operation 2005 Expected closure 2016	Employees 350 (+1000 indirectly employed as contractors)
Type of Mining Conventional drift-and-fill	Host rock Massive sulphide mineralisation strata bound within a marble horizon
Ore-genetic type Lead-zinc-silver carbonate replacement type mineralisation	Product applications Base metals
Ore tonnage mined in 2009 Run of Mine: 231,397t Production in 2009: 36,921t (sphalerite) 17,365t (galena)	Percentage of recycled input materials Coarse tailings to backfill - 64% Run off Mine Waste rock- 11% Run off Mine as construction material
Total amounts of overburden, rock, tailings, and sludge 223,715t	Total volume and percentage of water recycled and reused 21,900m ³ - 100%
Land owned/land disturbed 140.4ha/6ha	Distance from nearest town(s) 4km from coastal town of Stratoni
Philanthropic contributions to the community 'Small business start-ups' Programme	Main activities in region Vineyards and farmland producing wines, honey, olives and oil

Core Team at Stratoni Model Site

HELLAS GOLD S.A. (HG), Greece

Mine owner/R&D provider

Institute of Geology and Mineral Exploration (IGME), Greece

R&D provider, Sampling

Grecian Magnesite S.A. (GM), Greece

Mine Owner/R&D Provider

CALDURAN Kalkzandsteen BV (CALDURAN), The Netherlands

New product manufacturer

SELOR eeig, The Netherlands

R&D provider, Process Development

Technische Universiteit Eindhoven (TU/e), The Netherlands

R&D provider, Modelling

ProMine Partners



GTK, GEOLOGIAN TUTKIMUSKESKUS
PMO, PYHÄSALMI MINE OY
VTT, VALTION TEKNILLINEN TUTKIMUSKESKUS
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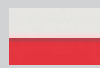
BRGM, BUREAU DE RECHERCHES GÉOLOGIQUES ET MINIÈRES
INPL, INSTITUT NATIONAL POLYTECHNIQUE DE LORRAINE



BOLIDEN, BOLIDEN MINERAL AB
KEMAKTA, KEMAKTA KONSULT AB
LTU, LULEÅ TEKNISKA UNIVERSITET



IGME ES, INSTITUTO GEOLÓGICO Y MINERO DE ESPAÑA



CUPRUM, KGHM CUPRUM SP ZOO
CENTRUM BADAWCZO-ROZWOJOWE
ECOREN, KGHM ECOREN S.A.
IMN, INSTYTUT METALI NIEZELAZNYCH



AGCMP, AGC MINAS DE PORTUGAL UNIPessoal LIMITADA
LNEG, LABORATORIO NACIONAL DE ENERGIA E GEOLOGIA, I.P.



GEOS, G.E.O.S. INGENIEURGESELLSCHAFT MBH
TU BAF, TECHNISCHE UNIVERSITÄT BERGAKADEMIE FREIBERG
WOLA, WOLA CHEMISCH-TECHNISCHE ERZEUGNISSE GMBH



SELOR, SELOR EEIG
TU/e, TECHNISCHE UNIVERSITEIT EINDHOVEN
CALDURAN, CALDURAN KALKZANDSTEEN BV



HG, HELLAS GOLD S.A.
IGME GR, INSTITUTO GEOLOGIKON KAI METALLEFTIKON EREVNON
GM, ELLINIKI LEFKOLITHI ANONYMOS METALLEFTIKI VIOMIHANIKI NAFTILIAKI KAI EMPORIKI ETERIA



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