

Mining – Hydraulic – Waste Disposal Project

Detailed Design for Kokkinolakkas Tailings Management Facility (TMF) in Kassandra Mines

Chalkidiki, Northern Greece

Project

Elaboration of detailed design of Kokkinolakkas Tailings Management Facility (TMF) in Kassandra Mines. Detailed design of two (2) dams (upstream & downstream embankments).

The project involves the construction of an integrated dry stacking area to store the tailings from ore processing at Mavres Petres and Olympias Mines.

Construction Cost

Total cost: approx. € 12,1 m.

Project Schedule

Design: 2013 – 2017
Construction: 2013 – on going

Project Description

Upstream Embankment Dam

- Dam crest length: $\approx 242\text{m}$
- Dam crest width: 10m
- Height in the dam axis $\approx 40\text{m}$

Downstream Embankment Dam

- Dam crest length: $\approx 547\text{m}$
- Dam crest width: 10m ~ 163m
- Height in the dam axis $\approx 80\text{m}$

Kokkinolakkas Basin

- Tailings surface area: 393.090m^2
- Tailings storage volume: $\approx 10,5 \text{ Mm}^3$

Geology

Ground surface deposits from mining activities, amphibolites – amphibolitic gneisses, biotitic gneisses, groundwater
High seismicity area (Stratoni – Varvara fault)

Our Services

- Detailed design of one (1) rockfill upstream embankment dam, serving as cofferdam to Kokkinolakkas stream flow
- Detailed design of one (1) rockfill downstream embankment dam, serving as the southern boundary of the closed basin and as toe buttress to the existing Karakoli embankment
- Dams construction & deposition schedule
- Dams risk analysis and break-out study
- Basal liner system detailed design of Kokkinolakkas basin
- Detailed hydraulic design
- Detailed design of all required structures
- Water Management / Diversion Works / TMF Water Balance
- Dams & slopes stability analysis & assessment
- Internal road network design
- Geotechnical Investigation Program Planning and Supervision
- Geological – Hydrogeological – Geotechnical Interpretation and Evaluation
- Construction follow-up services / Technical expertise consulting
- Designer on site services
- Elaboration of closure & rehabilitation plans
- Tender documents for construction – BoQ's
- Permitting design



Client

HELLAS GOLD S.A. {Subsidiary of ELDORADO GOLD (CA)}

Construction works

Mining - Hydraulic Tunnel

Kokkinolakkas Diversion Tunnel

Chalkidiki

Northern Greece

Project

Design of Kokkinolakkas' diversion tunnel for the protection of dry stacking Tailings Management Facility area, produced at Mavres Petres and Olympiada underground mixed sulphide ore mines

Construction Cost

Total cost: approx. € 6 m.

Project Schedule

Design: 2011 - 2014

Construction: 2012 - 2014

Project Description

Diversion tunnel: 1,200m total length

Mean longitudinal inclination: 6,5%

Effective cross section: 37,2 m²

Geology

- Amphibolites
- Amphibolitic gneisses

Excavation Method

NATM – Drilling & blasting – mechanical means
Final lining with reinforced concrete

Our Services

Detailed technical design for the construction of Kokkinolakkas diversion tunnel (according to articles No 4 and 101 of the Greek Mining Regulation)

Client

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Kokkinolakkas diversion tunnel inlet structure



Kokkinolakkas diversion tunnel underground section

Mining Project

Mining Processing Waste Deposits

Stratoni, Chalkidiki

Northern Greece

Project

Embankments and relevant works in the area of Kokkinolakkas waste deposit

Construction Cost

Total cost: approx. € 3 m.

Project Schedule

Design: 2006

Project Description

- Integration extent of waste deposit area: 418 acres
- Waste deposit lining from 2 embankments
 - Upstream embankment: - Crown length: 245m
 - Max. height: 42m
 - Downstream embankment: - Crown length: 690m
 - Max. height: 96m
- Construction of hydraulic tunnel with approx. 1.400m length due to Kokkinolakkas deviation, which is coming along the integrated waste deposit area
- Fully sealed waste deposit area with installation of specific webs

Geology

Ground surface deposits, Amphibolites

Our Services

- Geological – hydrogeological – geotechnical evaluation of the project area
- Localization and evaluation study of queries in the project area and selection of construction materials
- Hydraulic study and hydraulic design of the management outflows in the embankment area
- Pre-study and design of the embankments and the relevant works
- Pre-study and design of waterproofing and protection deposit area
- Embankment danger analysis based on geological, geotechnical and structural control measures
- Bill of Quantities – Budget

Client

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Disposal area view



Disposal area embankments plan view