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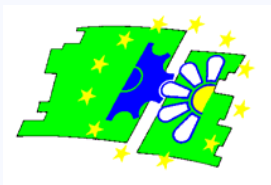
# Mining waste

**Directive 2006/21/EC of the European Parliament and of the Council on the management of waste from the extractive industries**

[http://europa.eu.int/comm/environment/waste/  
mining.htm](http://europa.eu.int/comm/environment/waste/mining.htm)



# Current EU legislation pertaining to mining waste (1)



## Waste Framework Directive (75/442/EEC as amended)

- General provisions and principles on all types of waste
- Doctrine:
  - Prevent or reduce waste production & its hazardousness.
  - Recycle / Reuse / Recover / Energy Recovery
  - Safe final disposal
  - Polluter pays principle
- Covers waste from “prospecting, extraction, treatment and storage of mineral resources as well as from the working of quarries” insofar as they are not covered by other (Community or equivalent national) legislation



# Current EU legislation pertaining to mining waste (2)



## Landfill Directive (1999/31/EC)

- Authorization system
- Control procedures
- Co-disposal ban
- Pre-treatment of waste obligatory
- Technical requirements
- Reduction of biodegradable waste
- Methane recovery
- Internalization of cost
  
- **Mining waste covered** (except for unpolluted soil and non-hazardous inert waste)



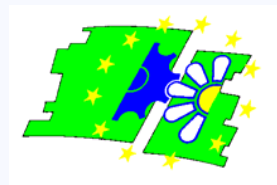
# Other EU legislation pertaining to mining waste



- ♦ **IPPC** (96/61/EC)
  - Mineral extraction not covered (unless “directly associated activity”)
- ♦ **Seveso II** (96/82/EC, revised by 2003/105/EC)
  - Tailings disposal covered when dangerous substances involved
- ♦ **Hazardous waste** (91/689/EEC)
  - Some mining waste included in list of haz. waste
- ♦ **Water Framework Directive** (2000/60/EC)
  - Point sources of pollution, incl. mining, concerned
- ♦ **EIA** (85/337/EEC, 97/11/EC)
  - Extraction and landfills in Annex I or II
- ♦ **Nature (Habitats/birds dir.** 92/43/EC, 79/409/EEC)
  - Appropriate assessment for Natura 2000 sites



# Major accidents



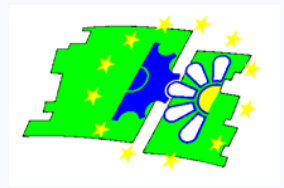
← Aznalcóllar  
(1998)



↗ Baia Mare  
(2000)



# Commission's commitments



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## Communication from the Commission

**“Promoting Sustainable Development in the EU non-energy Extractive Industry” (Com(2000) 265 Final)**

“One essential requirement for achieving sustainable development is the integration of environmental concerns into every stage of an operation from planning stage, to operational, to site restoration and aftercare”

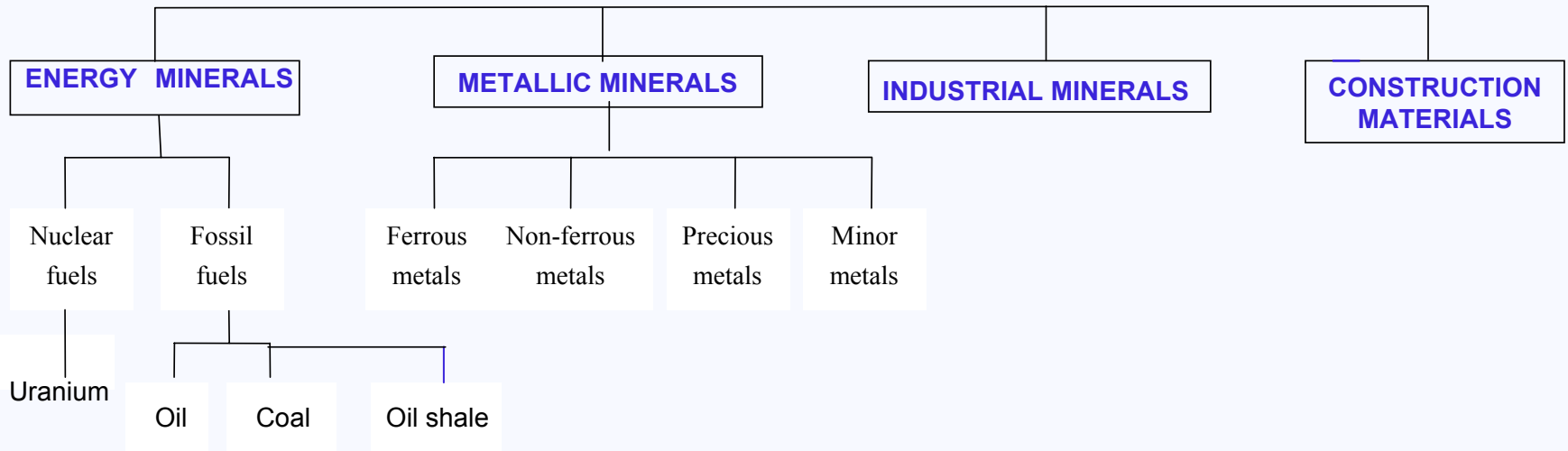
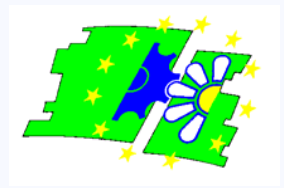
## Communication from the Commission

**“Safe operation on mining activities: a follow-up to recent mining accidents” (COM(2000) 664 final)**

- Amendment of Seveso II Directive
  - Best Available Techniques Document on waste-rock and tailings
  - Legislative initiative on mining waste
-



# Extractive industries



Some of the most important metals:

Ferrous metals: Fe; Mn, Ni, Cr, Mo, W, V, Co

Non-ferrous metals: Cu, Pb, Zn (base metals); Sn, Al

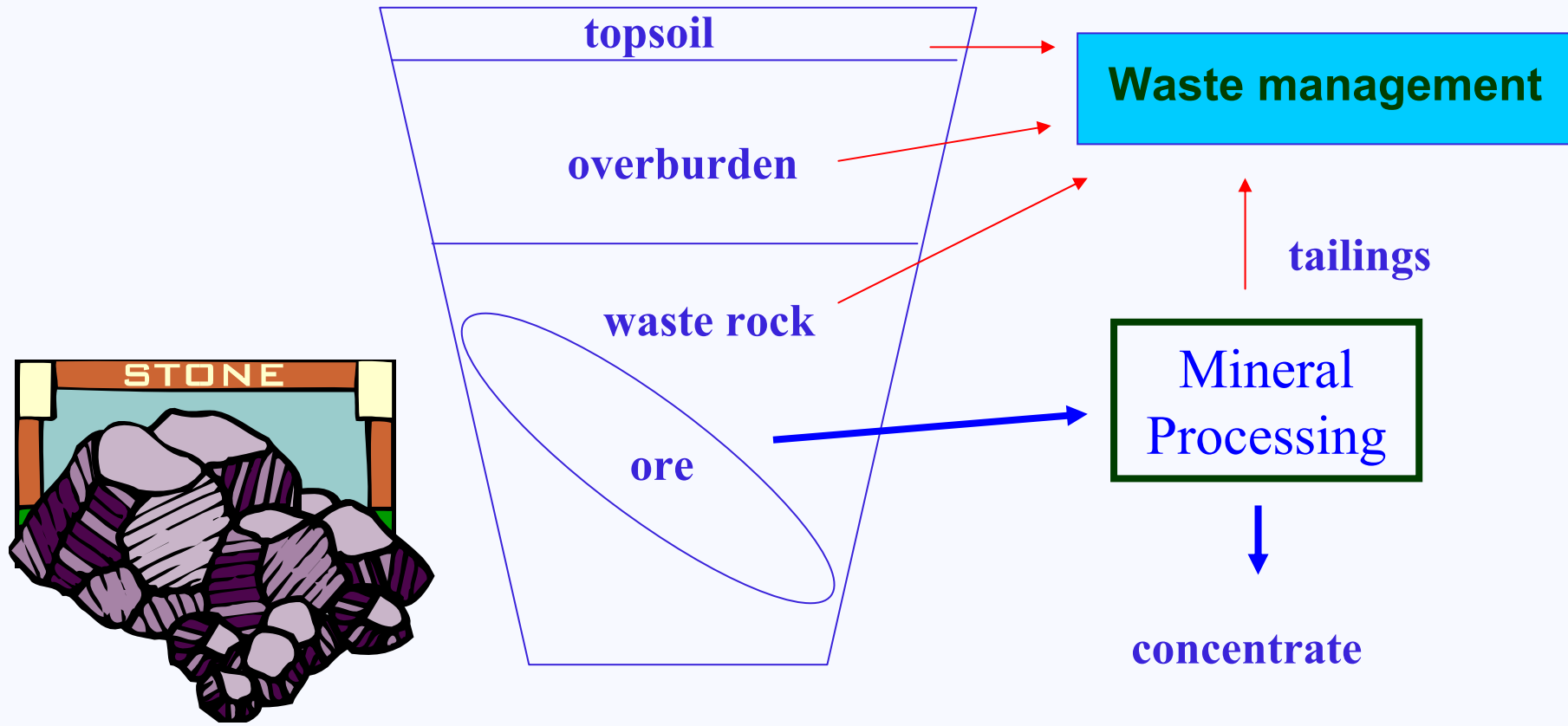
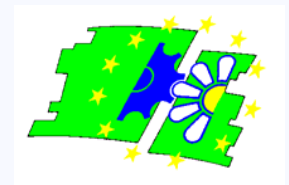
Precious metals: Au, Ag, Pt

Minor metals: Sb, As, Be, Bi, Cd, Ce, Hg, Nb, Ta, Ti, Zr

Fissionable metals: U, Th



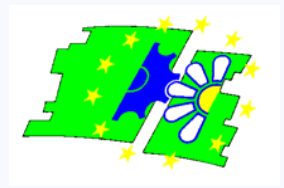
# Mine and quarrying processes and related waste pathways







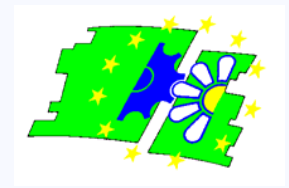
# Mining waste Directive Nature



- **Stand-alone directive ('other legislation' under Art. 2(1)b(ii) of Waste Framework Dir 75/442/EEC)**
- **Once this directive in force, Waste Fram. Dir. and Landfill dir. 99/31/EC will not apply**
- **Aspects not covered still subject to Waste Fram. Dir. / Landfill regime**



# Mining waste Directive Objectives

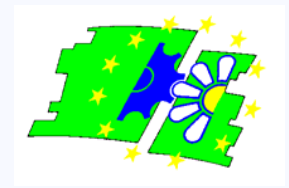


- Ensure **safe management of mining waste**
- **Prevent or reduce effects** from management of all **mining waste facilities** (i.e. waste heaps and tailings ponds) throughout their life-cycle
  - planning, licensing and eventual closure and after-care **of waste facilities**
  - emphasis on **stability** and prevention of **water** and **soil** pollution
- Prevent **major accidents** or minimise their consequences for **Category A** (high-risk) waste facilities
  - ... through measures based on **BAT**



# Mining waste Directive

## Scope



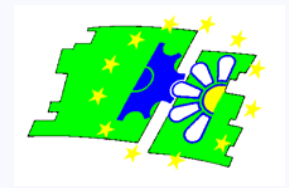
- **Covers** waste from *prospecting*, extraction and processing of mineral resources, such as overburden and topsoil, waste rock tailings
- **Excludes** non mining-originating waste, waste from off-shore extraction
- Limited requirements for **inert waste**, unpolluted soil, waste from peat (exempted from permits, closure/after-care, fin. guar. – unless in Category A when all provisions apply)
- Certain requirements for non-hazardous non-inert waste may be reduced (Notification of destabilising events, fin. guar – unless in a Category A facility when all provisions apply)



# Mining waste Directive

## General requirements

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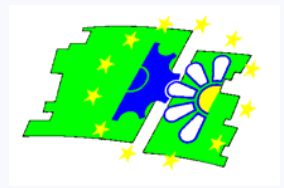
- MSs take measures “to ensure that “extractive waste is managed without endangering human health and without using processes or methods which could harm the environment, and in particular without risk to water, air, soil and fauna and flora”.... They also take measures “to prohibit uncontrolled depositing of extractive waste”. [Art. 4 dir. 75/442/EEC]
  - The operator takes all measures necessary to prevent or reduce as far as possible any adverse effects on the environment and human health, including the management of any waste facility, also after its closure, and the prevention or mitigation of major accidents
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# Mining waste Directive

## Waste management plan

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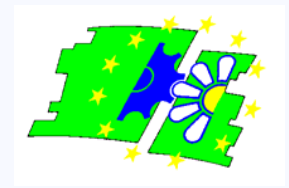


- Drawn up **by the operator** in order to:
    - prevent or reduce waste production and its harmfulness
    - promote backfilling and recovery of waste
    - Ensure short/long term safe disposal
  
  - **Minimum content**
    - Document on major-accidents (where applicable)
    - Waste characterisation / quantities
    - Waste-generating operations
    - Environmental effects, mitigation measures, monitoring
    - Prevention of water status deterioration & air and soil pollution
    - Survey of land affected
    - Plan for closure & after-care
  
  - **Reviewed every 5 years**
  
  - **Approved by the competent authority**
-



# Mining waste Directive

## Permits to facilities



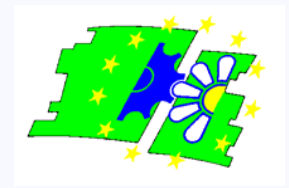
- **Minimum elements**
  - operator, location
  - waste management plan
  - financial guarantee
  - EIA
- **Public participation** in permitting procedure
  - Information to be provided to the public
  - Results of consultations to be taken into account for decision
  - Information about decision
- Procedure for **updating**
- May be **combined with other permits**



# Mining waste Directive

## Major accidents

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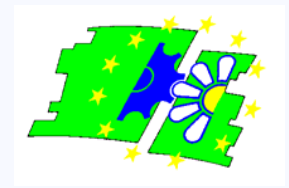
- For high risk facilities (Category A)
  - Complementary to revised Seveso II Dir.
  - **Major-accident prevention policy**  
incl. safety manager and safety management system for implementation
  - **Emergency plans** (internal/external)  
incl. minimisation of effects and clean-up and rehabilitation after a major accident
  - Notification mechanism in case of major accident
  - Public participation
-



# Mining waste Directive

## Construction & management of waste facilities

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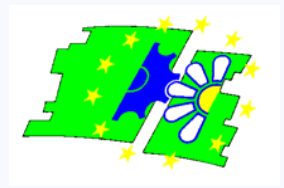
- Under a competent person
  - Technical development and training of staff
  - **Requirements on**
    - Suitable location and design
    - Stability and water-soil pollution prevention
    - Monitoring and follow-up action
    - Rehabilitation, closure and after-care
    - Notification of adverse events and corrective measures
    - Reporting of monitoring results
-





# Mining waste Directive

## Water, air & soil pollution



Measures to prevent water status deterioration, air & soil pollution, by meeting standards of EU environmental legislation, in particular **Water Framework Dir. 2000/60/EC**

- Evaluate and prevent leachate generation
- Collect and treat contaminated water and leachate
- Prevent or reduce dust and gas emissions
- Disposal into water bodies subject to compliance with standards of EU Water Legislation

### •Cyanide concentrations in tailings ponds:

- Reduce WAD CN to lowest possible level, and in any case
  - < 50 ppm by transposition date, < 25 ppm 5 years thereafter
  - < 10 ppm 10 years thereafter or by transposition date for new facilities



# Mining waste Directive

## Closure & after-care of waste facilities



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- **Conditions for starting closure procedure - Controls by competent authority**

in particular re. rehabilitation of land affected

[‘rehabilitation’ means the treatment of the land affected by a waste facility in such a way as to restore the land to a satisfactory state, with particular regard to soil quality, wild life, natural habitats, freshwater systems, landscape and appropriate beneficial uses;]

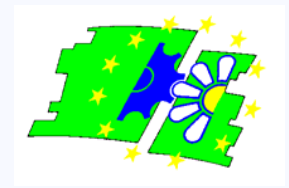
- **Responsibility of operator for after-care**

- Monitoring, control and corrective measures, in particular stability & effects on surface and groundwater
- Notification of adverse events & corrective measures
- Reporting of monitoring results



# Mining waste Directive

## Financial security

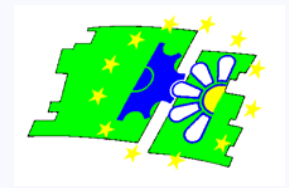


- System of **financial guarantees**
  - Established by the **operator** on commencement of operations
  - Funds readily available to cover costs of **rehabilitation of land affected** if walk-away
  - **Independently** calculated and periodically adjusted
- **Environmental Liability** applies to the management of extractive waste



# Mining waste Directive

## Backfilling

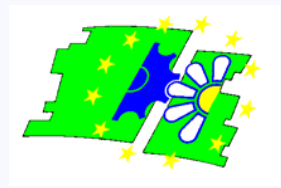


- **Concerns waste placed back into excavation voids for rehabilitation or construction purposes**
- **Requirements on:**
  - **Stability of waste**
  - **Water/soil pollution prevention and compliance with Water Fram. Dir. 2000/60/EC**
  - **Monitoring the waste and the void**



# Mining waste Directive

## Closed/abandoned facilities

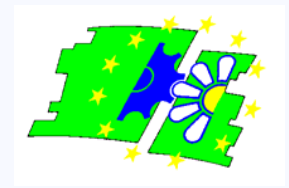


- 
- MSs to **draw up inventories** of closed/abandoned waste facilities causing or likely to cause serious negative effects on environment or human health
  - **Within 4 years** from date of transposition
  - Periodically **updated**, made available to the **public**
  - Development of **methodologies** for:
    - Drawing up **inventories**
    - **Rehabilitation** of most polluting facilities
-



# Mining waste Directive

## Other provisions

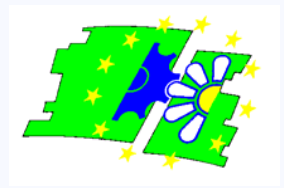


- **Transboundary effects**
  - Transmission of information in case of accident
  - Consultation between MSs for permitting high risk facilities, incl. public participation
- Regular **inspections** by competent authority and record keeping by operators
- **Exchange of information** on BAT



# Mining waste Directive

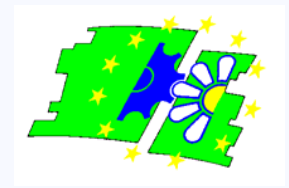
## Transitional provisions



- **Facilities already permitted or in operation on date of transposition: compliance within 4 years (6 for fin. guarantee) from that date**
- **Basic requirements, incl. compliance with Water Fram. Dir., applicable from entry into force**
- **Specific requirements for facilities under closure on date of entry into force (to be effectively closed by end 2010)**



# Mining waste Directive Implementing measures



To be adopted by the Commission within 2 years from entry into force, with the assistance of the Committee of national representatives ('Comitology' procedure):

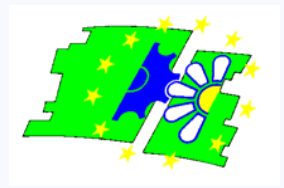
- Waste characterisation
- Definition of inert waste
- Classification of waste facilities in Category A
  
- Transmission of information to competent authorities
- Cyanide measurement
- Financial guarantee
- Inspections
- Sampling / analysis methods





# Amendment of Seveso II

(Directive 2003/105/EC)



## ‘Control of major-accident hazards involving dangerous substances’

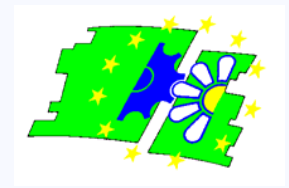
Inclusion of certain extractive activities into the scope:

- **Chemical and thermal processing operations and storage** related to the exploitation (exploration, extraction and processing) and storage of minerals in mines, quarries or by means of boreholes, which involve dangerous substances, as defined in Annex I of the Directive;
- **Operational tailings disposal facilities, including tailings ponds or dams**, containing dangerous substances as defined in Annex I, in particular when used in connection with the chemical and thermal processing of minerals.



# BAT Reference Document (BREF)

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## *‘Reference document on Best Available Techniques for Management of Tailings and Waste-Rock in Mining Activities’*

### **Purpose:**

- Help prevent accidents related to tailings dams
- Optimise “day-to-day” performance of tailings and waste-rock management

by being a guide for

- authorities
- industry
- interested public

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