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Implementation of "Cleaner Production" Strategies in the Aggregates Industry. What is relevant for the mining companies in Vietnam?

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Content

- Cleaner Production (CP)
- Application of CP in Mining
- Integrated Management Systems
- „Good Mining Practice“

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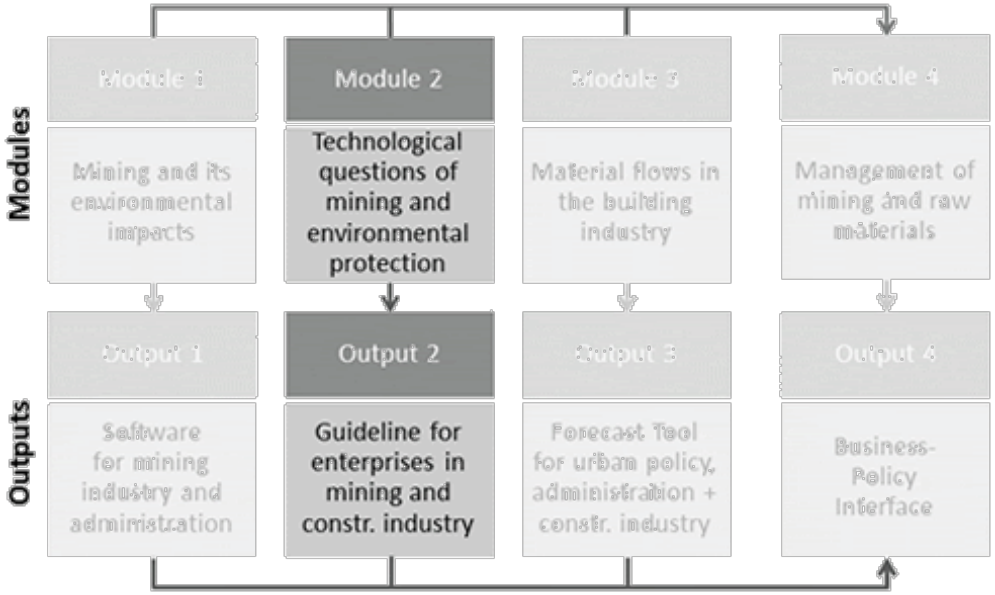
Module 2: Cleaner Production Technology

Module 2 is aiming at capacity building of mining companies with regard to planning of cleaner production technologies and environmental remediation in mining areas. The output is projected as a guideline to apply cleaner production techniques in the management of mineral resource extraction in Vietnam.



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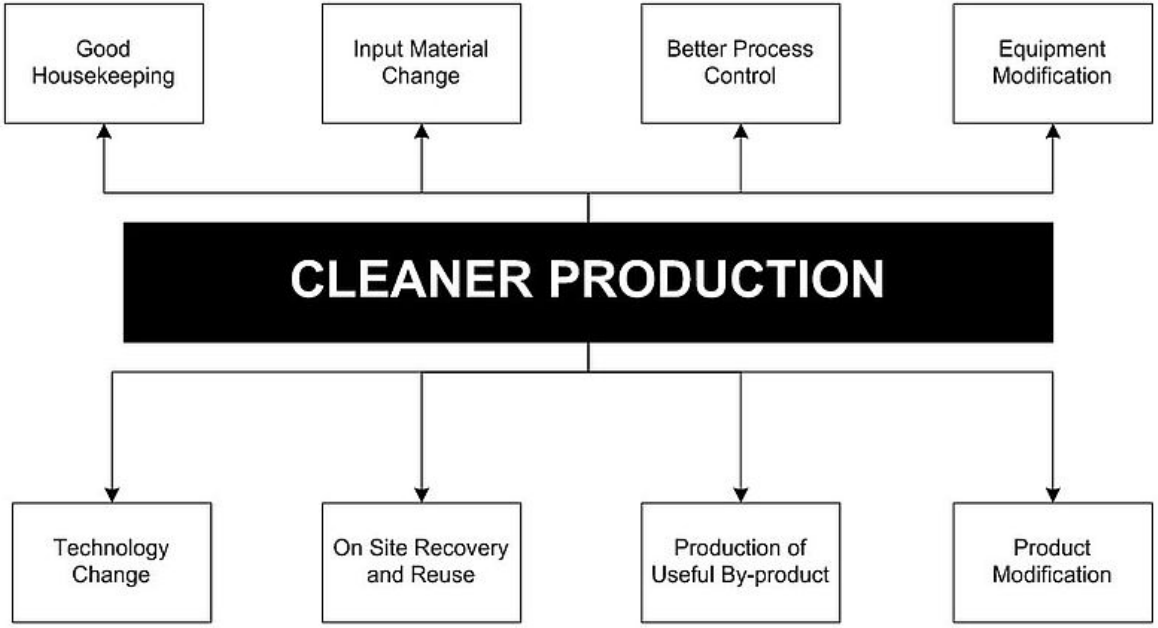
Cleaner Production

The United Nations Environment Program developed in 1991 the following CP definition that is still commonly used:

"CP is the continuous application of an integrated preventative environmental strategy to processes, products and services to increase efficiency and reduce risks to humans and the environment".



Source: United Nations Environment Program

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Cleaner Production

- The goal is to improve the eco-efficiency in companies by implementation of technical or organisational actions
- By reducing the negative effects to the environment operating costs are reduced
- Cleaner Production works with process integrated – preventive - methods instead of End-of-Pipe solutions

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What are the benefits of Cleaner Production?

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Improving environmental situation

Increasing economical benefits

Continuous environmental improvement

Increasing productivity

Gaining competitive advantage

… a win-win-win situation …

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Cleaner Production

Cleaner Production emphasizes precautionary, site-specific environmental measures to trace waste and wastewater emissions at their place of origin by means of the operational material and energy flow analysis as starting points for internal improvements in industrial processes.

The approach is generally based on quality, environment and occupational safety management rules, as are given in DIN ISO 9001, 14011 and 18001, and forces the integration between them.

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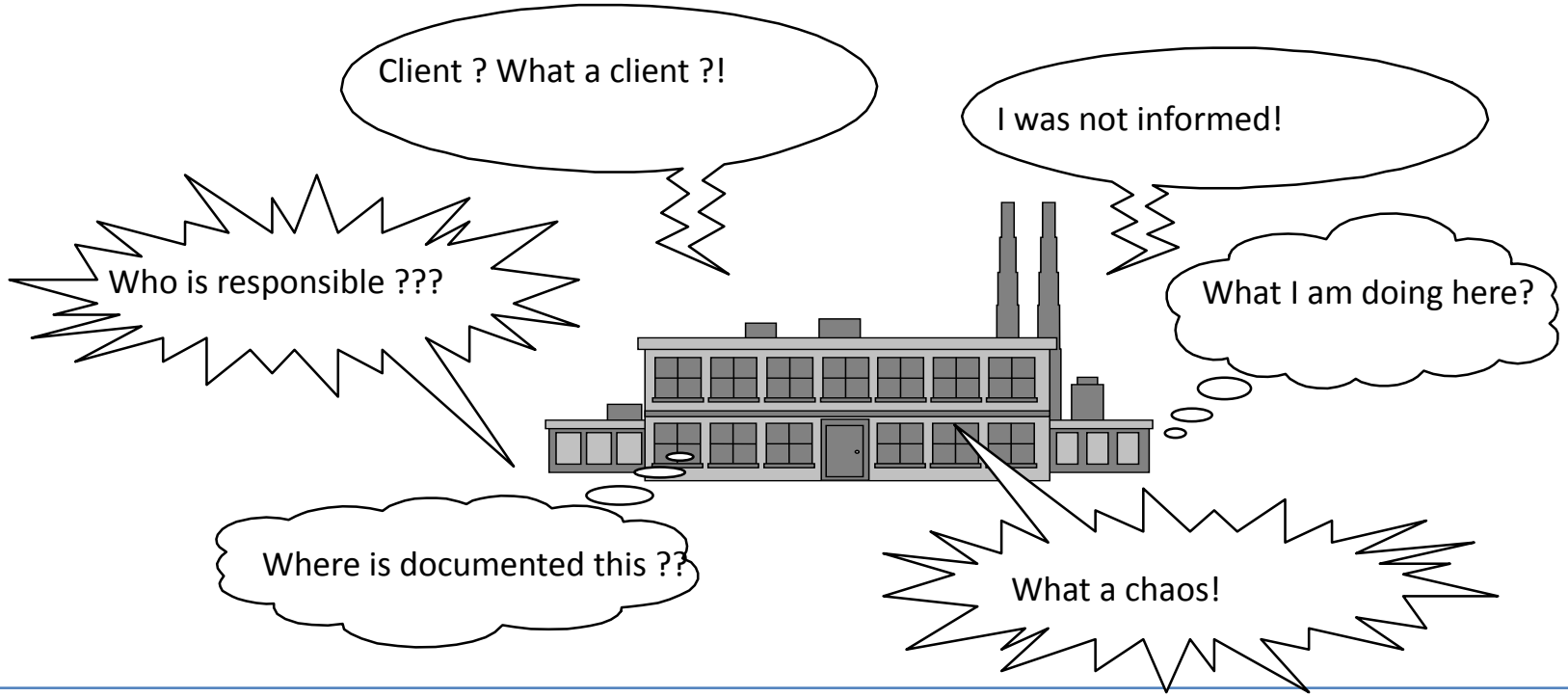
What is the purpose of a management system?



A management system is used to obtain a structure in the company's processes and to create rules for the employees, thereby obtaining smooth, effective and efficient processes, can realize both external and internal requirements without error.

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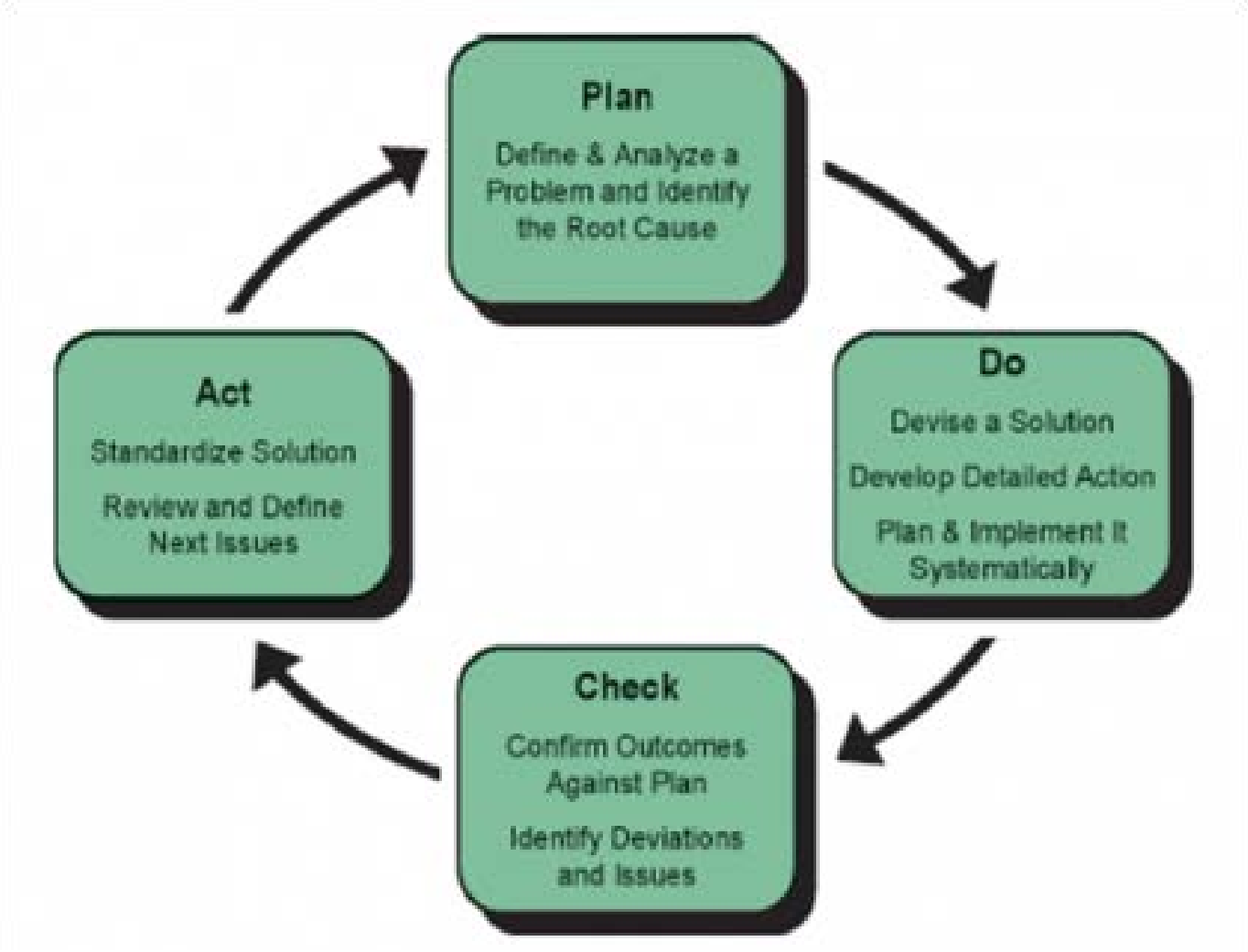
Management: PDCA Cycle



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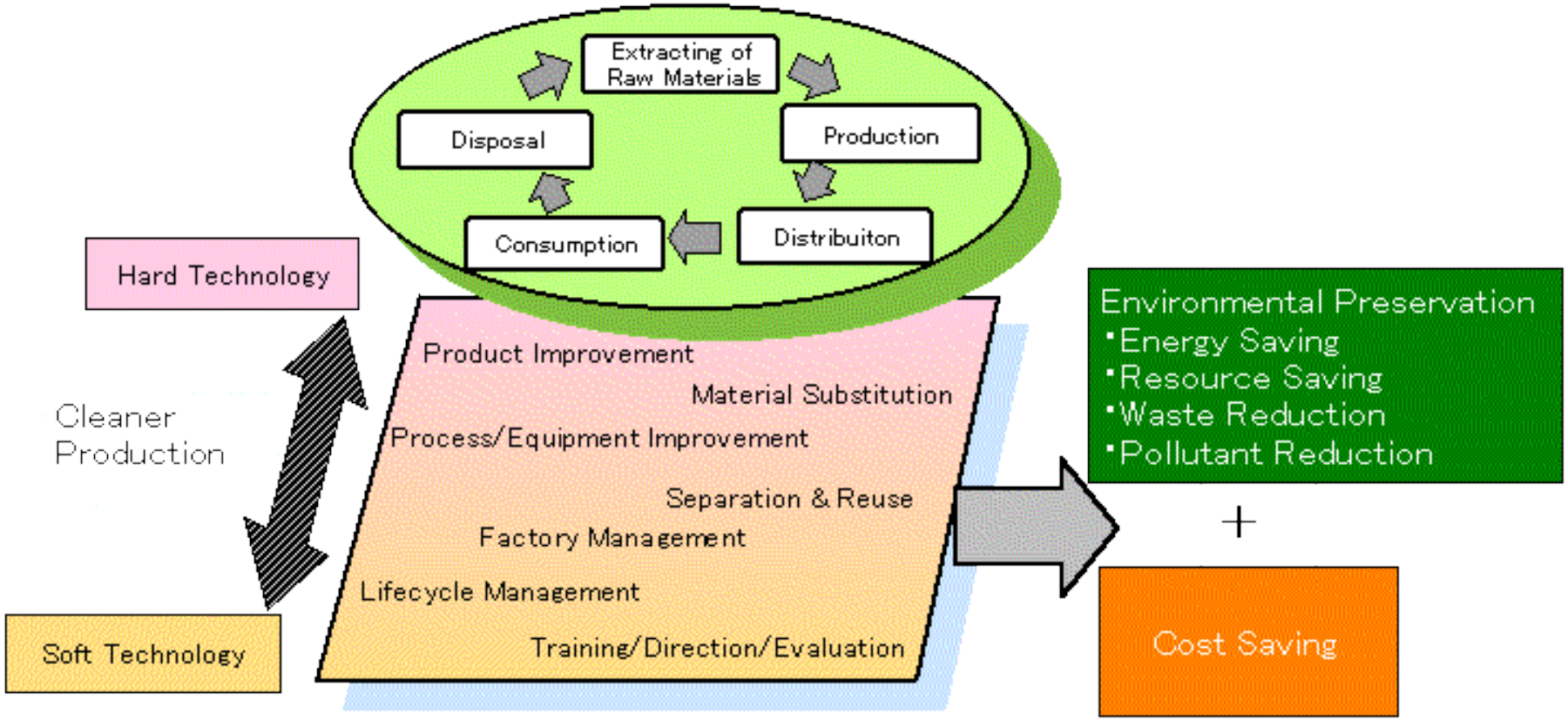
Cleaner Production and Application of the PDCA Cycle



Source: Global Environment Centre Foundation

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Integrated Management Systems

Integration of several systems in one integrated system

- Quality Management
- Environmental Management
- Risk Management
- Occupational Health and Safety

- …
- Energy Management
- Information Management

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Integrated Management Systems

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Quality Management

Scope of the QMS

The quality management tasks are to make all management, planning and control activities in a way that the needs of the customer / market are satisfied. Basis: DIN EN ISO 9001

Principles of QMS

1. Customer-oriented organization
2. Leadership
3. Employee involvement
4. Process approach
5. System approach to management
6. Continuous improvement
7. Factual approach to decision making
8. Supplier relationships for mutual benefit.

Integrated Management Systems

Environmental Management

Scope of the EMS

Through preventive environmental hazard areas are identified, taken security measures, thus minimizing the risk of environmental damage and location-based contamination can be avoided. Basis: DIN EN ISO14001

Principles of EMS

1. Formulation of an appropriate corporate environmental policy with the company's commitment to meet these.
2. Establishment of a plan to meet the environmental corporate policy.
3. Implementation of environmental policy / environmental management system
4. Measurement, monitoring and evaluation of environmental performances.
5. System evaluation and continuous improvement.

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Integrated Management Systems

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Risk Management

Scope of the RMS

Through a targeted analysis and consideration of the drivers affecting the company risks these are regularly assessed and measures to hedge against these risks are taken. Basis: ISO 31000

Principles of the RMS

based on the Deming Circle

Create a project plan (PLAN)
Reporting the actual condition (DO)
Definition of measures (check)
Evaluation of the Result (ACT)

Occupational Health and Safety Management System

Scope of the OHS

A safety management system is intended primarily for employees and enterprises by accidental failures and faults as possible reduced to a minimum and the associated costs are kept low. Basis: OHSAS18001

As in any other management system are also in the Health and Safety Management System exist elements strategy, corporate policy, objectives, responsibilities, planning, documentation and continuous improvement of the system components.

However, the OHS must be supplemented in terms of company-specific requirements (eg. as safety sensitive areas).

Information Security Management System

Scope of the ISMS

An information security management system is a set of policies concerned with information security management or IT related risks..
Basis: BS 7799

Principles of ISM
1. Security company policy / security requirements
2. Organization of security
3. Classification and control of corporate assets
4. Personnel security
5. Physical and environmental security
6. Management of Communication
7. System development and maintenance
8. Information Security and Incident Management
9. Compliance with legal and organizational requirements

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Ressource Efficiency in Mining

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- use resources more efficiently
- make not utilized to date local deposits available, under the provison, that they can be used more effectively by targeting the mineral potential
- Applicable in underground and surface mining, essential for aggregates industry

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Ressource Efficiency in Mining

Multicomponent extraction in a large quarry (Friedrichswalde-Ottendorf)

additional use of ceiling strata as in environmental and civil engineering

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Impacts of Aggregates Mining on the Environment

- Contamination of surface water or ground water (turbidity)
- Changes to flow rate of surface or ground water
- Air pollution
- Damage to soils
- Wind and water erosion
- Noise or vibration
- Impacts of dumps on soil, water and air
- Loss of landscape
- Loss of flora and fauna, biodiversity
- Damage to heritage sites.

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Implementation of Cleaner Production strategies in Vietnam

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- Technical optimisation measures of the mining operation in order to achieve resource efficiency (raw materials, energy, hazardous substances),
- Technical precaution measures of the mining operation in order to achieve improved occupational health and safety,
- Technical environmental protection measures in order to achieve a reduced environmental impact (waste water, waste, noise, dust, vibration, exhaust gas …),
- Emergency preparedness,
- Mitigation of the land consumption and mining site rehabilitation,
- Compensation of losses of natural habitats and ecosystem services,
- Implementation and enforcement routines in order to ensure the control.

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Precautionary Approach

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

Principle 15, Rio Declaration

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Principle 15, Rio Declaration

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Precautionary Approach in Mining

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- Adopting environmental codes of practice
- Consulting with key stakeholders
- Comprehensive environmental impact andrisk assessment studies
- Environmental management systems
- Setting targets for environmental protection to the highest level technically achievable
- Constantly reviewing technical developments which could be applied to further reduce impacts or the risk of impacts

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„Best Mining Practice“

- “Best practice” is the best way of doing things.
- “Best practice” in mining protects the environment and reduces the impacts of mining, and adheres to the principles of sustainable development.
- “Best practice” is identified by bench-marking the performance of companies in an industry.
- Best practice is linked to continual improvement; Improvements in technology or in industry standards usually call for further improvement.