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## EIA Review Checklist



**Mining and the  
Environment**

*Mining is a sustainable activity*

## MINING EIA REVIEW CHECKLIST

### Reviewing the Content

#### General aspects

- Does the environmental assessment conform to national applicable legislation and guidelines? This commonly includes a listing of and a reference to relevant laws and regulations. International treaties should be included in the review process even so they may be not part of national EIA practice.
- Did the environmental assessment follow appropriate procedures? This requires the comparison of actual assessment process with legal requirements. The right to know is essential in many jurisdictions and the failure to disclose the project in the early phase of the environmental assessment may result in disapproval of the project on legal grounds.
- Is the study boundary for the environmental assessment explained and justified? Environmental assessment based on incorrect design of the study boundary will result in incomplete and/or inaccurate conclusions.
- How do the environmental effects change the costs and benefits of the project?
- Does the report address the terms of reference? Government review panels with commonly scrutinize the consistency of TOR and final EIA documentation. Any deviation will lead to report revisions.
- Is the information clearly presented and understandable by decision makers and the public? High quality maps and clearly written text are essential characteristics of an EIA documentation that conforms to international best practice.
- Is the correct terminology used? For the international audience, native English speakers should ultimately write the EIA documentation in clear and correct technical terms. Of note is that more often than not in countries with no or little mining history extensive mining terminology in the national language does not exist. This poses significant challenges to the EIA documentation and review, since mining terms may have been incorrectly translated from English into the national language.
- Is the information relevant and sufficient for the purpose of decision-making and condition setting? This question is the most significant aspect for review conclusions, and will largely determine whether or not an EIA can be accepted.

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#### Project Description

- Are the purpose(s) and objectives of the development explained? Beside the obvious purpose of all mining projects that is the extraction of minerals, mine objectives should also include a commitment to sustainable development.
- Is the mine life cycle (construction, operation to mine closure and post-mine environmental monitoring) clearly discussed? The estimated duration of the construction phase, operational phase, and where appropriate, decommissioning phase should be given, including a detail listing of all mayor activities during each phase. This includes details on the construction camp, and arrangement of transportation of workers and their families (including fly-in, fly-out schedules).
- Does the information describe mine design and size in sufficient detail to elaborated environmental and social impacts? Diagrams, flowcharts,

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facility layout, and maps will usually be necessary for this purpose. The numbers of workers and/or visitors entering the development site during both construction and operation should be estimated.

- Is the project area defined and illustrated on maps? While the location and size of individual facilities may easily be illustrated, the term project area in mining extends beyond the area of buildings, infrastructure and active mining areas. Note the differences of defining the project area in legal, environmental, and physical terms.
- Is some indication of the physical presence and appearance of the completed development within the receiving environment presented? This includes particularly visual impacts at day and night, and noise.
- Is mining and mineral processing described, including but not limited to expected production rates over time? Emphasis should be given on the accuracy of the mine description considering that non-mining professionals often compile EIA documentation.
- Is sufficient information provided on the nature and quantities of raw materials needed during both the construction and operation phases? In the construction phase this includes construction materials such as sand and gravel. The source of construction materials and its transportation should be addressed. In the operation phase, materials moved include topsoil, overburden, ore, auxiliary materials such as limestone, and tailings.
- Are mass balances presented as much as practical and feasible? Water balances for the mine and the tailings disposal area deserve particular attention.
- Are type and quantity of emissions and residues quantified? Of course, the prominent mine residues are overburden and tailings. However, numerous other emissions and residues are related to mining activities and should be recognized and adequately addressed such as methane gas emissions in coal mining.

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#### **Mine Wastes**

- Are the types and quantities of mine waste (in particular overburden and tailings) and other residual materials such as waste oil and scrap metals, and the rate at which these will be produced estimated? Note that by the very nature subsurface conditions vary locally and as a consequence mine waste characteristics will change over time.
- Is mine waste management over time documented together with the routes by which they will eventually be disposed of to the environment? This commonly includes the preparation of overburden and tailings management plans to support the findings of the environmental assessment.
- How are the quantities of residuals and wastes estimated and what is the degree of uncertainty? Mines often operate over one or more decades and even the best exploration efforts cannot cover all subsurface conditions that one will encounter during mine operation. Mine plans and mine wastes will change over time.
- Is the behavior of the ecosystem receiving mine wastes fully understood? Tailings disposal of the Ok Tedi mine in PNG and the Freeport mine in Papua are most likely the two most prominent points in case of this particular aspect of a mine EIA review. For both mines, ecological risk assessment studies span over many years, and environmental impacts continue to be in dispute.

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**Alternatives**

- Does the environmental assessment address the no action alternative? Note that the no action alternative in fact represents the baseline condition over time against which project impacts are measured.
- Have alternative sites for mine infrastructure been considered where these are practicable and available to the mine developer? The main environmental advantages and disadvantages of these should be discussed and the reasons for the final choice given.
- Where available, have alternative processes, designs, and operating conditions been considered at an early stage of project planning? Are the environmental implications of these alternatives investigated and reported where the proposed project is likely to have significantly adverse environmental impacts? If unexpectedly severe adverse impacts are identified during the course of the investigation, which are difficult to mitigate, alternatives rejected in the earlier planning phases should be re-appraised.

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**Site description**

- Is the land area defined which is taken up by the development and is its location clearly shown on a map? Environmental assessment is very much a planning process and for this purpose the EIA should include high quality maps. The interaction of existing environment and mine is best illustrated on a set of detailed and accurate topic maps.
- Does the environmental assessment include a description of existing and planned adjacent land use? Consideration of future adjacent land use planning without the mine is important to identify potential conflicting land use issues related to mine development.
- Do designated sensitive land use areas exist in the vicinity of the mine such as protected forest, wild life conservation areas, or wet lands?
- Is the access to the site and likely means of transport described? Massive transportation of people and materials is a main characteristic of any mining operation. The means of transporting raw materials and products to and from the site, and the approximate quantities, should be described. Emphasis should be given to river crossing which are likely to contribute to adverse environmental impacts.

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**Environmental setting**

- Is environment setting of the mine development elaborated and illustrated on map? The environmental assessment should demonstrate that all environment expected to be significantly affected by the mine has been included in the study. The affected environment should be defined broadly enough to include any potentially significant effects occurring away from the immediate mine site. These may include the dispersion of pollutants, infrastructure developments, material movement, and influx of people.
- Are the important components of the affected environment identified and clearly described? Important elements of the existing environment are settlement areas, critical habitats, wetlands, and any other areas of particular biological, esthetical or cultural value. Prominence and emphasis should be given to the social dimension of the mine project. The methods and investigations undertaken for this purpose should be disclosed and should be appropriate to the size and complexity of the assessment task. Uncertainty should be discussed.
- Does the environmental assessment take advantage of existing data sources? Existing data sources should have been searched and, where relevant, utilized. These should include local authority records, studies

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carried out by, or on behalf of, conservation agencies and/or special interest groups, and other publicly available data. Environmental impact studies of projects in close vicinity are particularly helpful.

- Are the baseline conditions accurately described? Local land use plans and policies should be consulted and other data collected as necessary to assist in the determination of the “baseline” conditions, that is, the probable future state of the environment, in the absence of the project, taking into account natural fluctuations and human activities (often called the ‘no action’ or ‘do nothing’ scenario).
- To what extent do primary field data collection compliment existing data? Sampling locations should be clearly indicated in maps, and field sampling should accommodate seasonal variation.
- Does the description of the environmental setting provide sufficient information on the social setting of the mine project? This information is not restricted to demographic data, but includes data such as land ownership, community and income structure, and dominant communication channels.

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**Public Disclosure and Participation**

- Does the environmental assessment demonstrate a genuine attempt to contact the general public and special interest groups to inform them on the project and its implications? Information provided should be unbiased and presented in a way so that it is easily understandable by affected parties.
- Which arrangements are in place to collect public opinions and concerns? Public meetings, seminars, discussions groups, etc., may be arranged to facilitate this. Note that international lenders will ask for a specific public disclosure and participation plan to demonstrate that public involvement has been taken adequately into account.
- Have the views and concerns of affected and interested parties been taken into account? Public disclosure only evolves into public involvement if such views and concerns are taken into consideration in mine development.

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**Impact identification**

- Does the environmental assessment identify direct effects and any indirect, secondary, cumulative, short-, medium-, and long-term, permanent and temporary, positive and negative effects of the project? Effects should be investigated and described focusing on effects with negative impacts upon the five environmental resources, namely humans and cultural heritage, flora and fauna, land use and soil, water, and air, and the interactions between these.
- Is a systematic methodology applied to identify impacts, such as project-specific checklists, matrices, panel of experts, or consultation? Supplementary methods (e.g., cause/effect of network analyses) may be needed to identify secondary impacts. A brief description of the impact identification methods should be given, as should the rationale for using them. When applicable, impact identification should follow relevant national guidelines.
- Is the applied methodology capable of identifying all significant impacts and appropriate to the size and importance of project impacts? Quantitative methods should be given preference, when ever possible.
- Are key impacts identified and selected for more intense investigation? While the environmental assessment should pay attention to all potential impacts, focus of the assessment should be on the most prominent

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expected impacts. More often and not, prominent impacts are social impacts related to the mine development. At the same time social impacts are often the most overlooked or least understood impacts in EIA studies.

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**Impact assessment**

- Are data sufficient for impact assessment? The data used to estimate the magnitude of the main impacts should be sufficient for the task. Data should be described and their sources clearly referenced. Any gaps in the required data should be indicated and the means used to deal with them in the assessment should be explained.
- Does the impact assessment consider unusual operation conditions? Consideration should not be limited to events that will occur under design operating conditions. Impacts that might arise from non-standard operating conditions, for example due to accidents or due to unusual meteorological conditions, should also be described. This includes the impact of prevailing draught or unusual wet conditions on mine water discharge.
- Are impacts determined as the deviation from baseline conditions, that is, the difference between the conditions which would be obtain if the development were not to proceed and those predicted to prevail as a consequence of it? The environmental assessment should be able to demonstrate that the regional development with and without the mine is well understood.
- Are predictions of impacts expressed in measurable quantities, where possible, with ranges and/or confidence limits? Qualitative descriptions, where these are used, should be as fully defined as possible (e.g., “insignificant means not perceptible from more than 100m distance”). At the same time impact assessment should not be overly academic and pretend an accuracy that does not exist.
- What (if any) are the impacts on environmentally sensitive areas, endangered species and their habitats, and recreational/aesthetic areas? Areas of particular value should be clearly identified and shown on maps, and the potential impacts upon such areas should be elaborated.
- Is the significance of the mine development to the affected community and to society in general fully described? Emphasis should be on the weak groups of the society that are most likely affected by negative impacts. Impact assessment related to land acquisition and resettlement should be based on detailed land acquisition and resettlement action plans.
- Is impact significance assessed taking into account appropriate national and international quality standards? Account should also be taken of the magnitude, location, and duration of the impact in conjunction with national and local societal values. The choice of standards, assumptions, and value systems used to assess significance should be justified and any contrary opinions should be summarized.
- What adverse effects are unavoidable?

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**Mitigation measures**

- Is the mitigation of all significant adverse impacts considered and, where applicable, are specific mitigation measures put forward? Any residual or unmitigated impacts should be indicated and justification offered as to why these impacts should not be mitigated.
  - Do mitigation methods considered include modification of the project, provision of alternative facilities as well as pollution controls? Mitigation by design is always the preferred mitigation measure. Modification in
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mine construction and mining sequence constitute often the best erosion control measure.

- Is it clear to what extent the mitigation methods will be effective when implemented, and to what extent impacts will occur? Where the effectiveness is uncertain or depends on assumptions about operating procedures, climate conditions, etc., data should be introduced to justify the acceptance of these assumptions.
- Is a comprehensive summary of the commitments by the mine developer to the mitigation measures presented? Details of how the mitigation measures will be implemented and function over the time span for which they are necessary should also be given. Details on required financial and human resources should be given, and how they are provided.
- Are appropriate monitoring arrangements proposed to check the environmental impacts resulting from the implementation of the project and their conformity with the predictions within the environmental impact statement? Provision should be made to adjust mitigating measures where unexpected adverse impacts occur. The scale of these monitoring arrangements should correspond to the likely scale and significance of deviations from expected impacts.
- Are compliance points for emissions such as water discharge from the tailings ponds defined and shown on a map? As an example, is the compliance point of tailings water discharge at the outlet of the detoxification plant, the tailings pond, or does the compliance point coincidence with the mine project boundary?

## Reviewing the Format and Presentation

### Layout

- The layout of the statement should enable the reader to find and assimilate data easily and quickly. Report structure should be in conformance with applicable guidelines and the terms of reference.
- There should be an introduction briefly describing the project, the aims of the environmental assessment, and how those aims are to be achieved.
- Information should be logically arranged in sections or chapters and the whereabouts of important data should be signaled in a table of contents or index. Supporting data are best compiled in a separate appendix. External data sources should be acknowledged.
- Unless the chapters themselves are very short, there should be chapter summaries outlining the main findings of each phase of the investigation.

### Presentation

- The text should be clearly written and should avoid any ambiguities. Conflicting statements or value-imparting adjectives and phrases should be avoided. A native speaker should proof read the final documentation.
- Technical terms, acronyms, and initials should be defined, either when first introduced into the text or in a glossary. Unnecessarily technical or obscure language should be avoided. Correct mining terminology should be used.
- Information should be presented so as to be easily understandable to the non-specialist. Tables, graphs, and other mode of illustration should be used as appropriate. High quality maps are essential for an internationally acceptable documentation.
- The environmental impact statement should be presented as an integrated whole. Important data and findings should be presented and discussed in the main text. Summaries of data presented in separately

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bound appendices should be introduced in the main text.

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**Objectivity**

- Prominence and emphasis should be given to potentially severe adverse impacts as well as to potentially substantial favorable environmental impacts. The statement should avoid disproportionate preference to impacts that are well investigated or are beneficial.
  - The statement should be unbiased; it should not lobby for any particular point of view. Summary of issues raised by consulters should be included.
  - Difficulties in and limitation of the environmental assessment should be acknowledged.
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**Non-technical  
summary**

- There should be a non-technical summary of the main findings and conclusions of the study. The non-technical summary should be presented as a stand-alone document with appropriate maps and illustrations. Technical terms, lists of data, and detailed explanation of scientific reasoning should be avoided.
  - The summary should cover all the main issues discussed in the environmental impact statement and should contain at least a brief description of the project and the environment, an account of the main mitigation measures to be undertaken by the developer, and a description of any significant residual impacts.
  - The summary should provide an accurate reflection of ES findings.
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