



“MAINTAINING ENVIRONMENTAL INTEGRITY IN MINING”



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Introduction

- Mining is an important industry within Guyana.
- The Environment is also important and requires protection.
- There are many socio- economic benefits associated with mining.
- There are several negative environmental impacts associated with mining.



ENVIRONMENTAL INTEGRITY

- *“The sustenance of important biophysical processes which support plant and animal life and which must be allowed to continue without significant change. The objective is to assure the continued health of essential life support systems of nature, including air, water, and soil, by protecting the resilience, diversity, of natural communities (ecosystems) within the environment.”*



Threats to Environmental Integrity – Water

- Used in a number of applications on mine sites
- Operational and Accidental Discharges
- Tailings Facilities (Tailings Ponds)
- Dewatering
- Diversion of surface water and pumping groundwater may affect **quantity** and **quality** of water resources



Threats to Environmental Integrity – High Energy Demand

- Energy-intensive processes
- Diesel fuel is used by trucks and excavators during mining, electricity is used to grind ore and refine metals
- -Construction of energy infrastructure also has environmental impacts



Threats to Environmental Integrity – Land Disruption

- Land used at every stage of the mine cycle: exploration, construction, operation, closure, and post-closure
- Vegetation Clearance for construction of buildings, roads, and powerlines, open pits or tunnels are dug to gain access to the ore, and waste storage facilities such as tailings ponds
- Habitat Loss and Deforestation



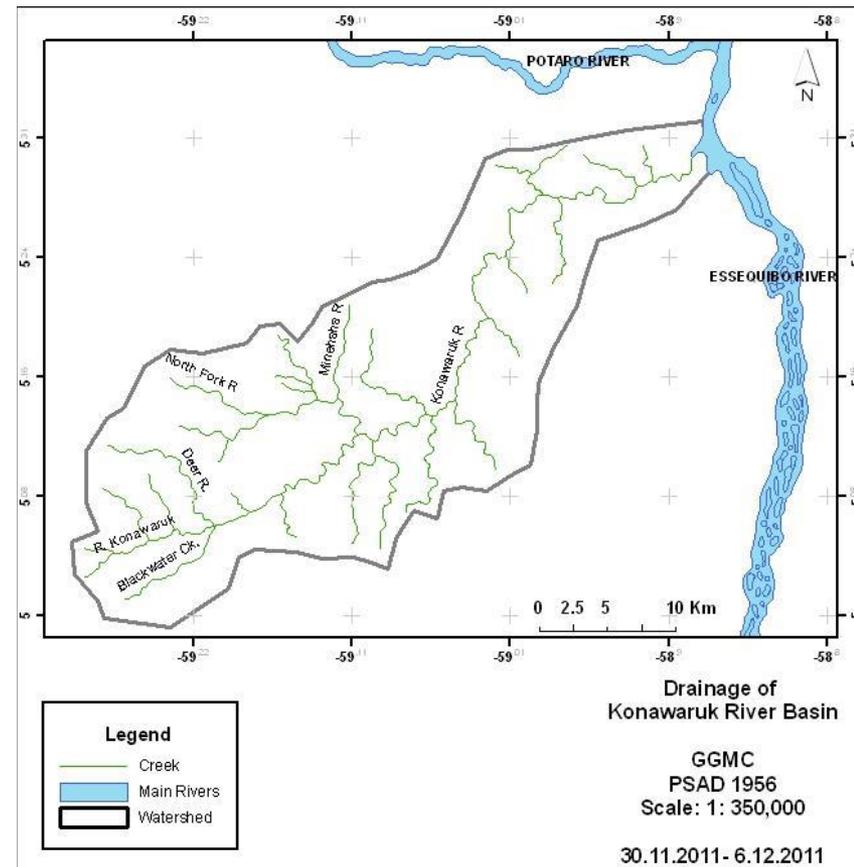
Threat to Environmental Integrity- Waste Generation

- Waste includes solid waste, mine water, and air particles, which can vary significantly in their composition and potential for environmental contamination.



Case Study: Konawaruk River Basin

- The Konawaruk River a left bank tributary that joins the Essequibo River.
- It is located in a heavily mined area that has a long history of human exploitation.



Case Study: Konawaruk River Basin

- Reports indicated ‘Konawaruk River is “dead”’.
- Extremely high in its solid load with levels usually exceeding the legal critical limit (30NTU).



Case Study: Konawaruk River Basin

- ❑ Other parameters such as Dissolved Oxygen and pH are of acceptable levels
- ❑ Land degradation and erosion is evident on the banks of the river
- ❑ Reclamation of the area is being considered



Measures to Mitigate Potential Risks from Mining

- Development and Implementation of Management Plans, Closure Plans and Reclamation Plans
- Construction and use of machinery during drier periods
- Construction and regular maintenance of tailings
- Monitoring of water and soil quality

Measures to Mitigate Potential Risks from Mining

- Responsible handling and storage of fuels, hazardous chemicals and waste at camps
- Implementation of Buffer zones and other erosion prevention practices.
- Development of Spill prevention and control measures

“It is important to be **Proactive** rather than **Reactive** when maintaining the integrity of the Environment”

Measures to Mitigate Potential Risks from Mining

- Innovative Water Conservation
- Reducing Energy Consumption and Use of Alternative Forms of Energy
- Minimizing the amount of waste produced and stored
- Maintaining biodiversity by transplanting or culturing any endangered plants found on site,
- Planning mines around existing infrastructure where possible

“Preventing pollution is more economic and effective at reducing environmental impacts than cleaning it up later”

Regulatory Framework

- The EPA is governed by the EP Act, 1996, which provides for:
 1. Management, Conservation, Protection, Improvement of environment.
 2. Prevention of control of pollution.
 3. The assessment of the impact of economic development on environment.
 4. Sustainable use of natural resources.

Regulatory Framework

- **Environmental Protection Regulations – 2000**
 - ✓ Water Quality
 - ✓ Air Quality
 - ✓ Noise Management
 - ✓ Hazardous Waste Management
 - ✓ Authorisation

Concepts of Environmental management

- Integrating environmental management practices into the planning and operational phases of mining projects (large scale and medium scale)
- Ensure the participation and dialogue with the affected communities and other directly interested parties on the environmental aspects of all phases of mining activities.
- Planning for environment management and mine operation should go hand in hand

Types of Mining Projects Authorised by the EPA

- Large Scale Projects – Gold, Diamond, Sand, Bauxite, Stone Quarry Petroleum (onshore and offshore), other (for e.g. Manganese).

Projects of this scale would require Environmental and Social Impact Assessments (ESIA) prior to the issuance of an Environmental Authorisation. For example – Pharsalus Gold Inc., Region 7.

- Medium Scale Projects - Gold, Diamond, Sand, Bauxite, Stone Quarry, Petroleum (onshore and offshore), other (for e.g. Manganese).

Projects of this scale would require Environmental Management Plans (EMP) prior to the issuance of an Environmental Authorisation. For example - Guyana Industrial Minerals Inc. (GINMIN) Bauxite Mine, Region 3

Types of Mining Projects Authorised by the EPA

- Small Scale Projects – Bauxite, Sand, Stone Quarry
- Projects of this scale do not require ESIA or EMP prior to the issuance of an Environmental Authorisation. For example, East Bank Kara Kara Bauxite Mine, Region 10.



Environmental Authorisation Process

- Environmental Authorisation Programme forms part of the EPA's environmental management system
- 1. Identification of environmental impacts associated with types of mining activities.
- 2. Management of environmental impacts through mitigation measures stipulated in the Environmental Authorisation (Environmental/Operation Permit).

Environmental Authorisation Process Stages

Stage 1

Submission of Application for Environmental Authorisation

- Required Documents:
- Proof of Land ownership (Bond payment & Block Description)
- Site Plan and Map of Area
- Project Summary
- ID
- Business Registration/Certification of Incorporation

Stage 2:

Conduct of Site Visit

- Determine the following
- EIA Not Required, EIA Required or EMP Required

Stage 3:

Publication of Relevant Notices
Notifying Developer of Findings

- EIA Required : 28 – day Public Notice
- EIA Not Required & EMP Required: 30 –day Public Notice

Environmental Authorisation Process Stages

Stage 4 (As Applicable) ESIA & EMP Process

- For projects requiring ESIA or EMPs, the respective processes are applied prior to the issuance of an Environmental Authorisation (Environmental Permit).

Stage 5: Issuance of Environmental Authorisation

- The Permit is subject to conditions the EPA identifies as necessary to protect and conserve human health and the environment and promote the principles of sustainable development.

Stage 6: Monitoring of Project in accordance with Environmental Authorisation

- Self monitoring through the submission of Quarterly, Bi Annual and Annual Report
- Compliance Inspections and Monitoring by the Environmental Protection Agency.

Challenges

- Environmental management tools (EIAs and EMPs) can be time consuming processes;
- Limited participation among stakeholders;
- Integrating economic activity with environmental integrity; and
- The perception that environmental management is a hindrance to economic growth.



THANK YOU 😊

