

Gahcho Kué Project

Environmental Monitoring & Management Framework

Technical Session May, 2012



November 28 - December 2, 2011

Presentation Overview

Environmental Monitoring & Management Framework (EMMF)

Document Scope

Document Objective

Approach

Traditional Knowledge

Wildlife

Aquatics

Scope of the Framework

- The Environmental Monitoring and Management Framework (EMMF) document, and this presentation, are intended to outline a monitoring approach for the Gahcho Kué Project and to obtain feedback from regulators and communities.
- Monitoring approaches will evolve with further details developed in parallel with the EIR and permitting process based on continued monitoring, input from regulators, communities, and decision-makers.
- Feedback on the EMMF will be considered for the development of detailed monitoring plans.

EMMF Document Scope

- The EMMF document is intended to provide the “what” with respect to monitoring and management for Gahcho Kué.
 - What is the approach being considered?
 - What should be monitored?
- The “how”, or the detailed study designs, will be advanced as the Project moves through the EIR with input from regulators and communities.

EMMF Document Objectives

- Demonstrate a forward thinking approach and commitment to monitoring.
- Consolidate monitoring from the EIS.
- Describe the linkages between management plans, monitoring efforts, reporting and adaptive management mechanism.
- Provide a collaborative mechanism to ensure monitoring is implemented and adapted effectively over the project life with input from communities and regulators.
- Provide additional information on specific monitoring programs, based on consultation to date.

Proposed Gahcho Kué Monitoring Approach

The approach consists of two interdependent frameworks:

1. Monitoring Program Framework:

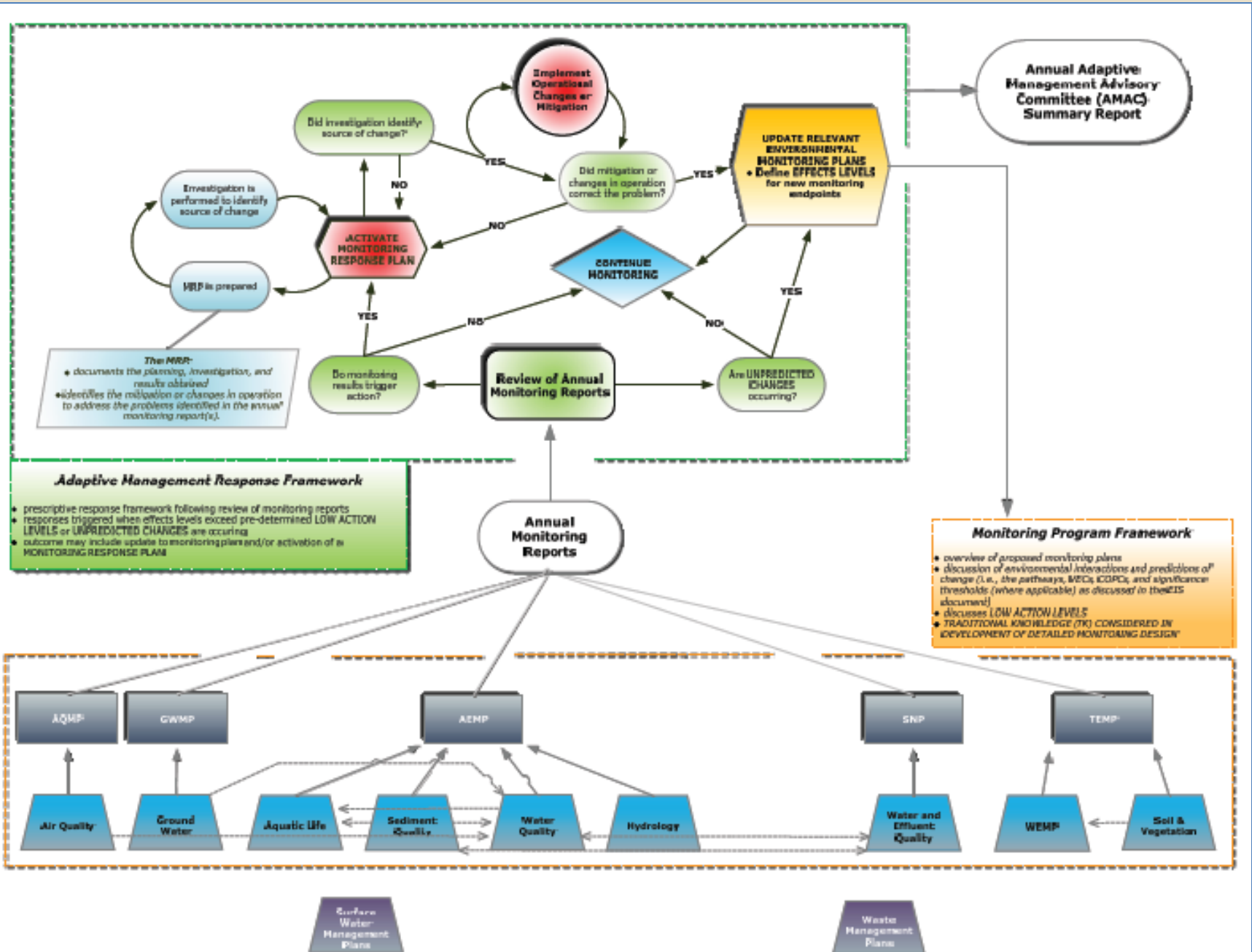
- Management Plans (air, water, waste etc.).
- Monitoring Plans (air, water, wildlife, etc.).
- Monitoring includes data collection, analysis and reporting.

2. Adaptive Management Response Framework:

- Collaborative review of program reports by regulators, communities and De Beers.
- Focus on continual improvement.

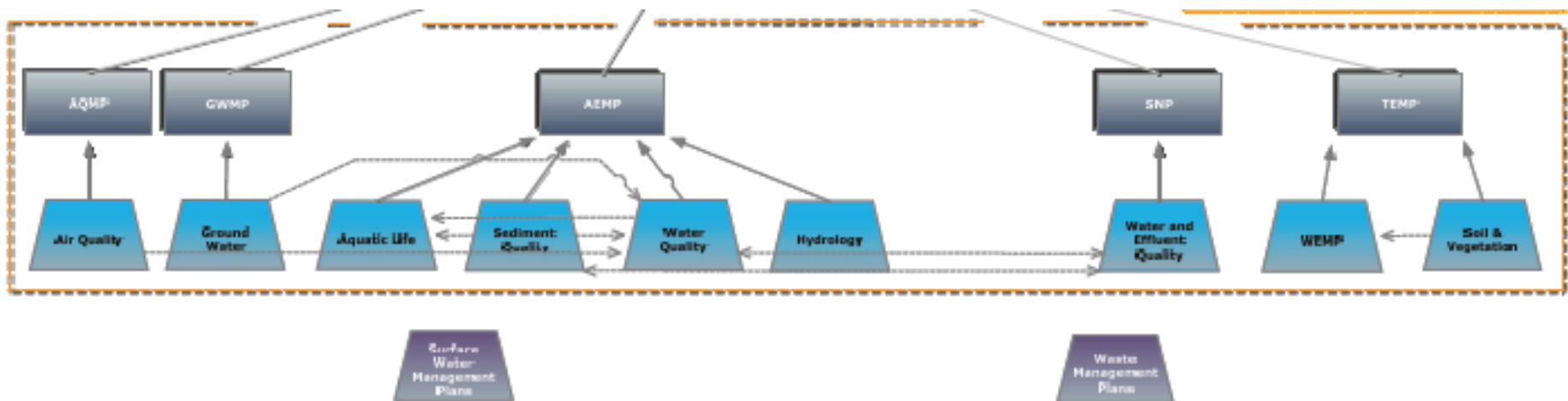
- Manage, Monitor, Report, Feedback

Concept Diagram



Monitoring Program Framework

- Driven by project management plans and key impact concerns.
- Identifies the individual monitoring components (air, water, wildlife etc.) and the corresponding monitoring program they are reported under.
- Monitoring plans developed to assess performance of key management actions, evaluate key impact predictions, and identify emerging issues.

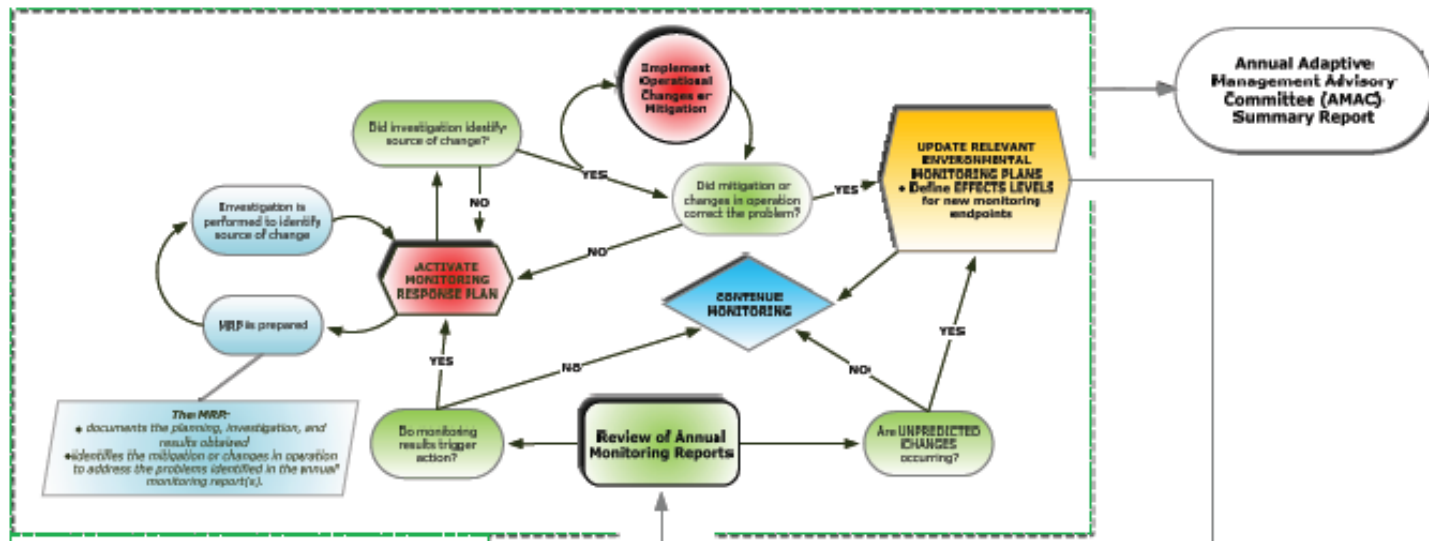


Reporting

- Annual Monitoring Reports prepared for applicable programs in that reporting year.
- Reports provided to the Adaptive Management Advisory Committee (AMAC) for review.
- AMAC to carry out the Adaptive Management Response Framework.
- AMAC to produce an annual summary report of outcomes.

Adaptive Management Response Framework

- Three options for the AMAC to consider:
 1. Continue monitoring if effects are being managed.
 2. Prepare a Monitoring Response Plan (MRP) if effects are greater than anticipated, or emerging issue is identified.
 - Response may include additional investigation to identify source and/or operational change.
 3. Adjust monitoring efforts as appropriate.



Traditional Knowledge

- De Beers is committed to incorporating TK considerations into management & monitoring plans wherever feasible based on community input.
- TK specific programs can also be considered and reported as part of the Adaptive Management Response Framework.
 - De Beers expects that forthcoming TK studies can provide input on possible programs.

Wildlife

- Approach is to build on what has been learned from other mines.
- Site surveillance monitoring to inform operations.
 - Wildlife observations. Scheduled surveillance checks. Adaptive management may lead to targeted site monitoring studies, where required.
- Participation in regional monitoring initiatives.
- Understanding roles and responsibilities are key.
- Programs should be flexible to allow timely response to new monitoring approaches and emerging issues.

Wildlife

- Winter road access monitoring
- Caribou:
 - Site surveillance
 - Possible TK specific study
 - Contribute to regional/population monitoring
- Carnivores:
 - Site surveillance
 - Contribute to regional/population monitoring
- Raptors:
 - Site surveillance
 - Regional 5 year survey
- Waterbirds
- Shorebirds
- Songbirds

Aquatics

- Verify the short-term and long-term effects of the Project on the aquatic ecosystems of surrounding and downstream surface waters.
- Evaluate the effectiveness of mitigation implemented as part of project design and adaptive management.
- Important to coordinate AEMP with regulatory requirements to reduce duplication.

AEMP Components

- Hydrology:
 - Water levels, flow rates , bank stability.
 - Focus on Area 8 and N11 outflows, key downstream locations and sensitive areas.
 - Meteorological monitoring, snow surveys.
- Water Quality:
 - Sampling at core set of internal locations and receiving environment.
 - Additional downstream stations in key lakes through Kirk Lake.
- Sediment Quality:
 - Undertaken at core monitoring stations along with benthics.
 - Includes the WMP areas.
 - Comparison with reference areas.

AEMP Components

- Lower Trophics
 - Approach currently being evaluated based on comments received. Possibility of using chlorophyll a and light attenuation.
- Fish
 - Health and tissue analysis
 - Population surveys
 - Fish migration surveys

Other monitoring plans

- **Soil and Vegetation**
 - Plots established prior to mine development.
 - Focus on sensitive areas.
 - Permanent vegetation plots for dust.
 - Permafrost and active layer monitoring.
- **Groundwater**
 - Monitored quarterly during pit development.
 - Two existing monitoring wells, plus additional two wells adjacent to open pit areas.
 - Pit inflow quantity and quality.
- **Air Quality**
 - Initial power generator emissions test.
 - Post commissioning stack test on incinerator.
 - Network of monitoring stations on perimeter of site, and wider area to evaluate dust deposition.
- **Progressive Reclamation Monitoring**

Summary

- De Beers is taking proactive steps to facilitate a coordinated and focused approach to monitoring and adaptive management.
- De Beers is committed to the inclusion of TK and local knowledge in management and monitoring.
- The AMAC will secure the involvement of regulators communities in monitoring and adaptive management.
- Multi-stakeholder collaboration is key to the success of regional monitoring.

Questions



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