EKATI Diamond Mine

- EKATI Diamond Mine is operated by BHP Billiton Diamonds Inc (BHPB),
- BHP Billiton’s and Canada’s first surface and underground diamond mine,
- Located 300 km NE of Yellowknife, 200 km S of Arctic Circle,
- Closest community = Wekweti (200 km NW),
- Sub Arctic, barrenlands environment,
- Claim Block size 860,000 acres
- 800 BHP Billiton employees. (including 313 -39% Northern Aboriginals); and 1000 contractors.
EKATI Diamond Mine

- First diamonds in the area were discovered by Chuck Fipke and Stewart Blusson in 1991,
- Processing of diamonds commenced in October 1998,
- Produces 4.5 to 5 million carats of rough diamonds per year
EKATI Diamond Mine – Current Mine Plan

Mine Plan
(1997-2003 based on actuals)

- Panda OP
- Panda UG
- Misery OP
- Misery UG
- Koala OP
- Koala UG
- Koala North OP
- Koala North UG
- Fox OP
- Beartooth OP
- Beartooth UG
- Sabre OP
- Pigeon OP

Calendar Year

- Infrastructure (roads, dams, etc...)
- Mine Development (waste mining)
- Mine Production (ore and waste mining)
EKATI Diamond Mine - Present

• Mining of seven kimberlite pipes in the current mine plan (Sable, Pigeon, Beartooth, Panda, Koala, Fox and Misery pipes),

• Present mine operations: Panda open pit complete, Koala, Misery, Beartooth, Fox open pits; and developing two underground mines (Koala and Panda)
EKATI Diamond Mine – Landscape

- Located in continuous permafrost
- Approx 150 km above treeline
- Multiple glaciations – 8,000 lakes within Claim Block
- Short growing season – daily temperatures in winter below -30°C and up to 25°C in summer
- Vegetation low in stature – ranges from lichen/shrub communities to sedge/grass marshes
- Little to no topsoil development
- Local wildlife: Barrenland grizzly, caribou, wolf, wolverine, fox and Arctic hare.
EKAII Diamond Mine – Summer Caribou Migration

Caribou grazing on the shores of Kodiak Lake 2001
EKATI Diamond Mine - Stakeholder Agreements

- Two Class A, and three Class B Water Licenses (Mackenzie Valley Land and Water Board)
- Land Use Permits (3)
- Land Leases (7)
- Fisheries Authorizations (Department of Fisheries and Oceans) (5)
- Socio-Economic Agreement (Government of the NT)
- Impact and Benefit Agreement - four, voluntary and confidential IBAs (4) with:
  - Dogrib Treaty 11
  - Akaitcho Treaty 8
  - North Slave Metis Alliance
  - Inuit of Kugluktuk & Kitikmeot Inuit Association.
- Many Federal and Territorial Statutes and Regulations
BHP Billiton Closure Standards/ Requirements

- BHP Billiton Closure Standards,
- Introduced Company Wide, July 2004
  - 7 Closure Requirements:
    - 1. Closure Plans for all Investment Opportunities
    - 2. Closure Plans for all Operations – Annual reviews and updates every 3 years.
    - 3. Identification of Risks and Potential Outcomes
    - 4. Estimating the Expected Cost of Closure
    - 5. Timely and Efficient Execution of Closure Plans
    - 6. Reporting, Audit and Governance Procedures
- Signoff of Reclamation Plan by BHPB Board on Closures estimated over $100 Million USD
- Internal Peer Review of Reclamation Plan at each stage of development
Key Considerations from the New Closure Standards

• Closure Pre-feasibility Phase … Once closure options & risks assessed

• Closure Feasibility Phase … for project areas closing in shorter term (progressive reclamation)

• Closure Projects > US $100M … requires formal independent review at Closure Pre-feasibility phase (EKATI)

• Closure Standards Compliance for EKATI … June 2007
EKATI Diamond Mine – Reclamation Units

- Presently working under approved Interim Abandonment and Reclamation Plan, February 2000
- Expected Mine Close 2015
- Main Reclamation Units
  - Open Pits and Underground
  - Waste Rock Storage Areas
  - Processed Kimberlite Containment Facility
  - Camp Pads/Roads/Airstrip
  - Water Management Structures/Diversions/Sedimentation Ponds
  - Quarry Sites
  - Fuel Facilities
EKATI Diamond Mine
Reclamation Units - Open Pits

Misery Pit

Panda and Koala Pits
EKATI Diamond Mine
Reclamation Units – Underground Mines

Koala, Koala Nth & Panda
Underground Complex
EKATI Diamond Mine
Reclamation Units – Waste Rock Storage Areas

Panda/Koala/Beartooth Waste Rock Storage Area
EKATI Diamond Mine - Reclamation Units
Processed Kimberlite Containment Facilities

Old Camp Phase 1

Long Lake Containment Facility
EKATI Diamond Mine
Reclamation Units – Camp pads, Roads, Airstrip
EKATI Diamond Mine
Reclamation Units – Water Management Structures, Dams, Diversion Channels

Panda Diversion Channel
Outlet Dam
EKATI Diamond Mine
Reclamation Units – Quarry Sites

Airstrip Esker
EKATI Diamond Mine
Reclamation Units – Fuel Facilities

Main Camp Fuel Farm
EKATI Diamond Mine – Reclamation Goals/Objectives

• Reclamation Goal: to prevent progressive degradation, and to enhance natural recovery of areas affected by mining.

• Objectives (Adapted from NT Reclamation Guidelines, 1990)
  1. Re-establish stable landforms
     – Through proper engineering practices
  2. Protect water resources in the local area
     – Minimizes the impact of mining activities on aquatic ecosystems and habitats
  3. Facilitate natural recovery of areas affected by mining
     – Allows natural successional processes, and integrates affected areas with adjacent, undisturbed areas
  4. To re-establish productive use of the land (Aboriginal and wildlife)
     – Through use of native plants, and final landscape features which encourage wildlife use
EKATI Diamond Mine
Proposed Reclamation Method
(2000 Approved Interim A&R Plan)

• Open Pits
  – Sable, Pigeon and Beartooth Pits – Options under assessment by BHPB
  – Panda, Koala, Fox and Misery Pits – Options under assessment by BHPB

• Underground Mines
  – Removal of hazardous materials, capping of vent raises and plugging of portals

• Waste Rock Storage Areas
  – Permafrost Development, monitoring & management of low level metal leaching
  – Wildlife Access Ramps
  – Nesting for birds and open areas for insect relief for caribou

• Processed Kimberlite Containment Facilities
  – Permafrost Development, Drainage Channels, Catchment Ponds, Rock Cap Cover (Present research focused on Vegetation Cover)
EKATI Diamond Mine
Proposed Reclamation Method
(2000 Approved Interim A&R Plan)

• Camp Pads/Roads/Airstrip
  – Demolition and Landfill of Camp Infrastructure, Contaminant Assessment/Remediated, Culverts, Bridges, & Road Berms removed and drainage re-established, Landscaping & Scarifying to encourage natural colonization

• Water Management Structures
  – Most Dams & Dykes left in as-built condition. Outlet Dam and Panda Frozen Core Dam Breached, thermistors removed. Water management pipelines and PK pipelines removed. Panda Diversion Channel – culverts removed and streamflow re-established

• Quarry Sites
  – Landscaping to prevent erosion and encourage plant colonization

• Fuel Facilities
  – Fuel tanks removed, and surplus fuel backhauled for proper disposal
Stakeholder Involvement in Reclamation Process

• Inclusion of stakeholders in the Reclamation Process
  – Community Visits (ongoing)
  – Northern Aboriginal Reclamation Glossary (Updated 2003 Plan)
  – Social Reclamation (Updated 2003 Plan)

• Northern Aboriginal and Northern Business participation in reclamation research and monitoring
  – Plant Identification and Collection
  – Northern Research – Nurseries (Hay River)
EKATI Diamond Mine – Aboriginal Involvement in Reclamation

Aboriginal Students & Technicians Working on Reclamation Projects

Visitors to Site - Discussing LLCF Vegetation Research

Stakeholder Meetings – Discussion of LLCF Operations and Closure Issues
EKATI Diamond Mine – Reclamation Issues

• Inconsistent terminology amongst users. (Reclamation/restoration, Goals/objectives/criteria) **BHPB is reclaiming, not restoring**
• Reclamation Guidelines outdated
• Criteria and Standards of Measure not in place
  – Reclamation Plans built without mutually agreed closure criteria
  – Progressive reclamation required, but no benchmark and method of Security Credit in place -
• Changing mine plans during the period of mining operations means conceptual reclamation planning. Interim Plan updated with Life of Mine Plan
  – **Conceptual and Prefeasibility Stage during Interim Plan**
• Regulatory desire for executable standard documents now – this is not practical for BHPB
Questions?