

Open Pits Closure Monitoring (Table 49. Appendix G)

CLOSURE MONITORING AND PERFORMANCE – OPEN PITS				
Parameter(s)	Method(s)	Location	Evaluation	Response Thresholds
AIR				
1. Fugitive Dust	Total suspended particulate sampling	TSP 2 (Grizzly Lake), and TSP 3 (Cell B LLCF)	Comparison with Canadian Ambient Air Quality Standards.	Exceedence of Canadian Ambient Air Quality Standards.
LAND				
1. Slope stability	Geotechnical Inspections	High walls, berms and channel banks Sable, Pigeon, Beartooth, Panda, Koala, Fox, and Misery	Check for slope stability (e.g., Signs of significant erosion, subsidence, slope failures, surface instability)	Evidence of significant highwall movement and or potential inter-bench failure, or channel bank slumping which has the potential to dam stream flow.
2. Percent vegetation cover	Inspections and monitoring of transects at reference and reclamation sites	Pads, pit lake perimeter and channel banks. Reference sites.	Identify plant types, and cover percentage. Record temporal and spatial cover growth/decline.	Increasing trend toward loss of vegetation cover.
WATER				
1. Lake levels and stream discharge	Aquatic Effects Monitoring Program (AEMP)	Source lakes and source lake outlet streams (locations to be confirmed).	Comparison with baseline and monitoring for change over time	Evidence of negative trend from baseline conditions.
2. Stream flow	Aquatic Effects Monitoring Program (AEMP)	Outflow streams from pit lakes (to be confirmed).	Measurement of stream flow, consistent or intermittent.	Prolonged period of no flow between pit lakes and downstream watershed.

CLOSURE MONITORING AND PERFORMANCE – OPEN PITS				
Parameter(s)	Method(s)	Location	Evaluation	Response Thresholds
3. Field: pH, Conductivity & Flow. Lab: Metals, Nutrients & general water quality parameters	Surveillance Network Program (SNP) Aquatic Effects Monitoring Program (AEMP)	SNP Locations: SNP-1616-14 (Panda) SNP-1616-15 (Koala) SNP-1616-39 (Misery) SNP-1616-45 (Fox) SNP-0008-Pi1 (Pigeon) SNP-0008-Sa1 (Sable) SNP-0008-Be1 (Beartooth) AEMP Closure Locations (to be confirmed).	Comparison with baseline and monitoring for change over time. Discharge water quality at pit lake discharge points meets water license criteria.	Increasing trends towards exceedence of discharge criteria.
WILDLIFE				
1. Wildlife habitat, movement, safety, abundance, mortalities, incidents, breeding, distribution, density, diversity.	Wildlife Effects Monitoring Program (WEM)	Current Study Area	Changes in habitat availability, biophysical environment, interaction with traffic, success of deterrent efforts, number of mortalities and incidents, caribou abundance, distribution, interaction and behavior, grizzly bear habitat use, wolf breeding success, wolverine population and distribution, density and diversity of breeding birds, falcon nesting and re-productivity.	Negative effects compared to conditions identified during 1995 EIS.
HEALTH & SAFETY				
1. Safe working procedures/practices.	Safety meetings, OH&S, HSEC Risk Registry upkeep and reporting. Compliance with Mine Health and Safety Act and Regulations	EKATI Minesite	Safety evaluation conducted during safety meetings (PASS), incident investigations (ICAMs), Mines inspections and reporting.	Identification of unsafe working conditions, injury or fatality to people/person at the minesite.
COMMUNITY				

CLOSURE MONITORING AND PERFORMANCE – OPEN PITS				
Parameter(s)	Method(s)	Location	Evaluation	Response Thresholds
1. Incorporation of TK into closure, BHP Billiton Sustainable Development Policy.	Annual site tours and visits to the Communities. Annual BHP Billiton HSEC audit.	EKATI minesite and communities.	Effects on caribou and other VECs, discussions on monitoring results, continued opportunities and effectiveness of TK, have targets been met, HSEC audit to ensure compliance with Sustainable Development Policy.	Audit failure against agreed action at start of closure.
2. Archaeological sites	Record of archaeological sites kept and monitored during reclamation activities (eg. Quarrying of esker materials) to ensure sites are not disturbed.	EKATI Claim Block	Monitoring of reclamation activities against identified sites.	Disturbance of Archaeological site/s.
OPERATIONS				
1. Operations, Procedures, and Reporting.	Annual Reports, Audits.	NWT and Corporate	Maintenance of compliance, certification (eg ISO 14001), and audit scoring.	Non-compliance, loss of certification, audit failure.

Monitoring Frequency – Open Pits (Table 55. Appendix G)

CLOSURE MONITORING PROGRAM FREQUENCY – OPEN PITS										
MONITORING PROGRAM	Closure Monitoring Period Years									
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
AQMP (Air)	A	A	A	A	A					
Geotechnical Inspections (Land)	A	A	A	A	A					
Vegetation Sampling and Inspection (Land)	A	A	A	A	A					
SNP (Water)	BA	BA	BA	BA	BA	A	A	A	A	A
AEMP (Water)	BA	BA	BA	BA	BA	A	A	A	A	A

WEMP (Wildlife)	A	A	A	A	A					
Health & Safety	C	C	C	C	C	C	C	C	C	C
Traditional Knowledge Monitoring (Community)	A	A	A	A	A	A	A	A	A	A
Archaeological Sites (Community)	C	C	C	C	C	C	C	C	C	C

BA = Bi-Annual, A = Annual, Q = Quarterly, M = Monthly, C = Continuous, OT = One Time

Underground Mines Closure Monitoring (Table 50. Appendix G)

CLOSURE MONITORING PERFORMANCE MEASURES – UNDERGROUND MINES				
Parameter(s)	Method(s)	Location	Evaluation	Response Thresholds
AIR				
N/A	N/A	N/A	N/A	N/A
LAND				
1. Slopes, drainages, surface stability of adit/raises plugs and seals.	Geotechnical Inspections.	Underground adit portal, vent raises Koala/Panda Underground Mine.	Check for slope stability (e.g., erosion, subsidence, slope failures, surface stability, collapse).	Evidence of instability and movement/failure outside of forecast cave zone.
WATER				
<i>(Contribution of ground water to pit lake water quality (See Open Pits WATER 3 in Table 49))</i>	N/A	N/A	N/A	N/A
WILDLIFE				
N/A	N/A	N/A	N/A	N/A
HEALTH & SAFETY				
1. Safe working procedures/practices	Safety meetings, OH&S, HSEC Risk Registry upkeep and reporting. Compliance with Mine Health	EKATI Minesite	Safety evaluation conducted during safety meetings (PASS), incident investigations (ICAMs), Mines Inspections and reporting.	Identification of unsafe working conditions, injury or fatality to people/person at the minesite.

CLOSURE MONITORING PERFORMANCE MEASURES – UNDERGROUND MINES				
Parameter(s)	Method(s)	Location	Evaluation	Response Thresholds
	and Safety Act and Regulations.			
COMMUNITY				
N/A	N/A	N/A	N/A	N/A
OPERATIONS				
1. Operations, Procedures, and Reporting	Annual Reports, Audits.	NWT and Corporate.	Maintenance of compliance, certification (eg ISO 14001), and audit scoring.	Non-compliance, loss of certification, audit failure.

Monitoring Frequency – Underground Mines (Table 56. Appendix G)

CLOSURE MONITORING PROGRAM FREQUENCY – UNDERGROUND MINES										
MONITORING PROGRAM	Closure Monitoring Period Years									
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Geotechnical Inspections (Land)	A	A	A	A	A					
Health & Safety	C	C	C	C	C	C	C	C	C	C

BA = Bi-Annual, A = Annual, Q = Quarterly, M = Monthly, C = Continuous, OT = One Time

Waste Rock Storage Areas Closure Monitoring (Table 51. Appendix G)

CLOSURE MONITORING PERFORMANCE MEASURES – WASTE ROCK STORAGE AREAS				
Parameter(s)	Method(s)	Location	Evaluation	Response Thresholds
AIR				
1. Fugitive Dust	Total suspended particulate sampling.	TSP 2 (Grizzly Lake), and TSP 3 (Cell B LLCF).	Comparison with Canadian Ambient Air Quality Standards.	Exceedence of Canadian Ambient Air Quality Standards.
LAND				
1. Slopes, drainages, surface stability.	Geotechnical Inspections. Thermal Monitoring.	Waste Rock Storage Area Slopes: Panda/Koala WRSA Misery WRSA Fox WRSA Pigeon WRSA Sable WRSA WRSA Thermal Monitoring Locations: Panda/Koala WRSA Misery WRSA Fox WRSA Pigeon WRSA Sable WRSA	Check for slope stability (e.g., erosion, subsidence, slope failures, surface stability), Comparison with baseline and monitoring for change over time.	Instability of side slopes, Increasing temperature trend.
2. Percent vegetation cover.	Inspections and monitoring of transects at reference and reclamation sites.	Topsoil and lake sediment/glacial till storage sites. Reference sites.	Identify plant types, and cover percentage. Record temporal and special cover growth/decline.	Increasing trend toward loss of vegetation cover.
3. Surface stability at quarry sites.	Surface inspections.	Airstrip Esker.	Changes in surface stability, thermokarst erosion, unstable channel banks.	Erosion of fines into streams and lakes.
WATER				
1 Field: pH, Conductivity & Flow. Lab: ICP Dissolved Metals, Nutrients, major ions, general water quality parameters.	Waste Rock Seepage Monitoring Program (WROSMP).	Seepage locations to be determined for Closure Monitoring.	Comparison with agreed criteria and monitoring for change over time.	Degradation of seepage water quality, significant pH change, volume of flow increases measurably.

CLOSURE MONITORING PERFORMANCE MEASURES – WASTE ROCK STORAGE AREAS				
Parameter(s)	Method(s)	Location	Evaluation	Response Thresholds
WILDLIFE				
1. Wildlife movement and safety	Wildlife Effects Monitoring Program (WEMP)	WRSA (access ramps).	Evidence and frequency of use of WRSA.	Negative effects compared to conditions identified during 1995 EIS.
HEALTH & SAFETY				
1. Safe working procedures/practices.	Safety meetings, OH&S, HSEC Risk Registry upkeep and reporting. Compliance with Mine Health and Safety Act and Regulations.	EKATI Minesite.	Safety evaluation conducted during safety meetings (PASS), incident investigations (ICAMs), Mines Inspections and reporting.	Identification of unsafe working conditions, injury or fatality to people/person at the minesite.
COMMUNITY				
1. Incorporation of TK into closure, BHP Billiton Sustainable Development Policy.	Annual site tours and visits to the Communities. Annual BHP Billiton HSEC audit	EKATI Minesite and communities.	Effects on caribou, discussions on monitoring results, continued opportunities and effectiveness of TK, have targets been met, HSEC audits to ensure compliance with Sustainable Development Policy.	Audit failure against agreed action at start of closure.
OPERATIONS				
1. Operations, Procedures, and Reporting.	Annual Reports, Audits.	NWT and Corporate.	Maintenance of compliance, certification (eg ISO 14001), and audit scoring.	Non-compliance, loss of certification, audit failure.

Monitoring Frequency – Waste Rock Storage Areas (Table 57. Appendix G)

CLOSURE MONITORING PROGRAM FREQUENCY – WASTE ROCK STORAGE AREAS										
MONITORING PROGRAM	Closure Monitoring Period Years									
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
AQMP (Air)	A	A	A	A	A					
Geotechnical Inspections (Land)	A	A	A	A	A					
Vegetation Sampling & Inspection (Land)	A	A	A	A	A					
WROSMP (Water)	BA	BA	BA	BA	BA					
WEMP (Wildlife)	A	A	A	A	A					
Health & Safety	C	C	C	C	C	C	C	C	C	C
Traditional Knowledge Monitoring (Community)	A	A	A	A	A	A	A	A	A	A
Archaeological Sites (Community)	C	C	C	C	C	C	C	C	C	C

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