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DE BEERS
A DIAMOND IS FOREVER

28 February 2003

Mackenzie Valley Environmental Impact Review Board (MVEIRB)
Box 938, 5102 – 50th Avenue
Yellowknife, NT X1A 2N7

Attention: Glenda Fratton, Environmental Assessment Coordinator

Dear: Glenda

SUBJECT: Overview of Project Milestones and Monitoring and Management Programs for the Snap Lake Diamond Project

Please accept the attached technical memo titled "Overview of Project Milestones and Monitoring and Management Programs for the Snap Lake Diamond Project" for submission to the Public Registry. This memo was compiled in response to issues raised by the North Slave Metis Alliance (NSMA) specifically, as well as monitoring issues raised by other community and government representatives in general, during the MVEIRB Technical Sessions.

Should you have any questions, please feel free to contact the undersigned.

Sincerely,
SNAP LAKE DIAMOND PROJECT

ORIGINAL SIGNED BY

Robin Johnstone
Senior Environmental Manager

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SNAP LAKE DIAMOND PROJECT
DE BEERS

TECHNICAL MEMORANDUM

Date: 28 February 2003

Submitted to: Mackenzie Valley Environmental Impact Review Board

Submitted by: De Beers Canada Mining Inc. and Golder Associates Ltd.

Subject: Overview of Project Milestones and Monitoring and Management Programs for the Snap Lake Diamond Project

OBJECTIVE

The purpose of this memorandum is to provide intervenors with a schedule of milestones relating to the development of the Snap Lake Diamond Project (SLDP), with specific focus on the development of monitoring and management programs. This information is being provided in response to interest expressed by intervenors, at the Mackenzie Valley Environmental Impact Review Board (MVEIRB) Technical Sessions (25 November – 6 December 2002), for De Beers to identify availability of environmental monitoring and management programs for review and input. In this memorandum, De Beers approach to the development of monitoring and management programs is outlined; critical timing in relation to mine permitting and development is noted; and proposed windows for intervenor involvement are identified.

Table 1: Schedule of Milestones for the Snap Lake Diamond Project

Milestone	Date(s)
Continuation of on-site monitoring programs	Spring/summer/fall 2003
Complete negotiations for the Socio-economic Agreement	03 June 2003
Finalize IBA's	03 June 2003
MVEIRB Report of EA to INAC Minister	27 June 2003
Minister's decision to proceed	25 July 2003
Water license hearing	28 October 2003
Complete EMS revisions for construction phase	22 December 2003
Draft water license issued	24 December 2003
Complete negotiations for the Environmental Agreement	31 January 2004
Water license issued	27 March 2004
Land use permit issued	29 March 2004
Land leases and License of Occupation issued	30 March 2004
Complete negotiation and finalize securities schedule	31 March 2004
Quarry permit issued	29 March 2004
Transport of buildings/equipment to site	2004 winter road season
Phase I pre-production program	02 July 2003 - 26 May 2004
Complete mine dewatering	25 May 2004
Pre-production development	26 May 2004 – 25 January 2005
Complete bulk sample plant upgrade and operation	25 April 2005
Mining lease issued	30 September 2004
Finalize environmental monitoring programs	30 September 2004
Finalize environmental management programs	31 March 2005
Site preparation and construction	3rd quarter 2004 – 3rd quarter 2006
Begin production	4th quarter 2006

APPROACH TO THE DEVELOPMENT OF PROGRAMS AND PLANS RELATING TO ENVIRONMENTAL MANAGEMENT OF THE SNAP LAKE DIAMOND PROJECT

Socio-economic Monitoring Programs

Details of the socio-economic monitoring program have not been included in this memorandum as these are being separately negotiated under a Socio-economic Agreement. Community representatives and government are involved in these discussions, with appropriate consideration being given to past monitoring programs developed for Ekati and Diavik.

Cumulative Effects Monitoring Programs

De Beers approach to cumulative effects monitoring outlines that, in the absence of a regional monitoring agency, De Beers will continue to collect project specific data in a manner that would contribute to a regional monitoring program. Additionally, De Beers will continue to participate in discussions pertaining to the development of cumulative effects monitoring on a regional basis.

Environmental Monitoring Programs

De Beers Canada Mining Inc. is committed to developing monitoring programs that meet the requirements of the results of the Environmental Assessment (EA) and regulatory review process and are developed in collaboration with communities, elders and governments. Refinement of these monitoring programs is an iterative process that relies on feedback from both the EA/ permitting process (ie: Technical Sessions, Public Hearings) and direct input from communities and government.

Monitoring protocols focusing on the effects of diamond mining in the Northwest Territories are generally well established. To avoid unnecessary duplication and ensure that standardized data could be provided for a potential regional monitoring program, protocols used for similar projects will be adopted wherever possible, recognizing the smaller scale and alternative (underground) mining method of the SLDP.

There are four components central to the environmental monitoring program, as identified in the EA and provided in the list below.

- Monitoring for regulatory compliance;
- Monitoring for project-specific socio-economic and environmental effects;
- Identifying circumstances under which additional mitigation should be undertaken if the results of measures in the plans are uncertain or if they fail; and,
- Participating in cumulative effects monitoring.

While the water license and land use permit for the SLDP will likely address monitoring programs associated with mine site development (mine infrastructure, geotechnical, geochemical, water quality, hazardous waste management and disposal, aquatic effects and reclamation), listed below are ten monitoring programs specific to this project that De Beers identified as a priority during development of the EA.

Monitoring Programs:

- Wildlife and Wildlife Habitat
- Aquatic Effects
- Air Quality
- Hydrogeology
- Hydrology
- Water Quality
- Geology and Terrain
- ELC and Biodiversity
- Heritage Resources
- Non-traditional Resource Use

All environmental monitoring programs will be incorporated into an Environmental Agreement, as will opportunities for community involvement within these programs.

The likely monitoring programs to occur are provided in Attachment 1, Table 2: Proposed Methodologies - Environmental Monitoring Program. This table outlines the resource components to be monitored, the purpose of the monitoring, general methodologies and the period for which they are to be monitored. In preparing this table, a review of the EA, Information Requests, De Beers Technical Information Sessions, MVEIRB Technical Sessions, intervenor Technical Reports, and Ekati and Diavik monitoring programs were undertaken.

In the future, the monitoring programs will be revised to include issues outlined during the MVEIRB Public Hearing in April, community and regulator input (including identification of where Traditional Knowledge (TK) would best be applied), and licensing requirements. Results of these monitoring programs will also be incorporated within the Environmental Management System (described on page 5), in order to ensure that required reporting, amendments and adaptive management practices are implemented.

As mentioned above, a review of both the Ekati and Diavik monitoring programs was performed. It is in the best interest of all parties that monitoring methodologies be consistent with other projects, thereby allowing data to be incorporated into a potential regional environmental monitoring plan, should this be realized. It is also important that monitoring efforts appropriately reflect the scale of the project and nature of mining when compared with other, much larger projects, such as Ekati and Diavik.

Environmental Management Programs

In December 2002, the Snap Lake Diamond Project Environmental Management System (EMS) was certified to the ISO 14001;96 standard. As a corporate commitment for all mining properties to be certified by 2003; De Beers Canada Mining Inc chose to apply for certification in a phased approach with respect to the overall development of the site EMS. This therefore permits the EMS to grow as the project advances through the various phases; current Care and Maintenance, into construction, then an operations phase and finally into the Reclamation and Closure phase.

The EMS is a key feature in executing the eight management programs (listed below) identified as a priority during development of the EA.

Management Programs:

- Reclamation and Closure
- Spill Contingency
- Emergency Response
- Water Management
- Waste Management
- Wildlife Management
- Quarry Management
- North Pile Development

As the project progresses through to construction, operations and closure, there is a need to continuously review and update the management system and programs. In order to maintain certification to the ISO14001;96 standard; De Beers will be required to undergo an external implementation/registration audit, with an ISO registered auditor as the project advances through each phase and the EMS is revised to reflect those changes in scope. An integral part of De Beers' EMS annual review requires an annual internal audit be completed to monitor progress of ongoing activities and to measure effectiveness of programs in achieving objectives.

Regular surveillance or maintenance audits are to be completed by an external auditor to ensure the De Beers' EMS continues to meet the ISO14001;96 standard. The results of these audits will be available for review with interested communities and government agencies in a public forum. Any management program requiring performance improvement would be identified and appropriately amended. By implementing these adaptive management measures, De Beers ensures that local concerns are addressed and a high level of environmental performance is achieved.

Similar to the process outlined for the environmental monitoring programs, these management programs will also need to be updated to reflect requirements outlined during the EA and permitting processes.

COMMUNITY INPUT

Process for Development of Environmental Monitoring Programs

- While developing the EA, critical monitoring commitments for specific resource components were identified and are summarized in Table 2 (Attachment I)
- Upon completion of the MVEIRB Public Hearing, Table 2 will be updated to reflect concerns identified during the hearing.
- The revised version will be distributed to intervenors for their review.
- During August and September of 2003, De Beers will meet with regulatory agencies and Land and Environment Committees (or community-designated alternates) from each of the Aboriginal organizations and primary catchment communities identified in the EA for their input on all aspects of the monitoring programs, including the practical incorporation of TK. It should be noted that De Beers would also be willing to re-schedule these meetings for the summer of 2003, if intervenors are willing to commit their availability for this process.
- After receiving input from intervenors, De Beers will again update the monitoring programs in time for the water license hearing.
- Negotiations for the Environmental Agreement provide another venue at which these monitoring programs will also be discussed.
- De Beers considers that community involvement in monitoring programs represents best practice, and the extent of this involvement will form part of the Environmental Agreement.
- Final revision of the monitoring programs will depend on the timelines agreed upon at Environmental Agreement negotiating sessions, or if regulatory requirements deem this necessary.

Process for Development of Environmental Management Programs

- Development of the EMS for the construction phase of the Snap Lake Diamond Project will begin in April 2003.
- Environmental management programs from the EMS will be circulated to intervenors for review when available.
- Final revision of the EMS and its associated management programs will occur after issuance of the water license, with completion scheduled for 31 March 2005.

CONCLUSION

As identified in both Table 1 and the Community Input section of this memo, there are a number of opportunities for intervenor review and input throughout the process of developing the environmental monitoring and management programs for the Snap Lake Diamond Project. More formal venues such as MVEIRB and Mackenzie Valley Land and Water Board Public Hearings, and Environmental Agreement negotiations provide an opportunity for intervenors to provide their input, whereas community visits and meetings with regulators provide an occasion for individuals to ensure their comments and concerns are understood.

Table 2 provides an outline of monitoring programs identified to date, which form the basis of an on-going review process intended to provide an opportunity for communities and regulators to contribute their traditional and scientific knowledge where feasible.

De Beers re-states their commitment to developing monitoring programs that meet the requirements of the results of the EA and regulatory review process, and that these monitoring programs will be developed in collaboration with communities, elders and government.

Attachment I

Table 2: Proposed Methodologies – Environmental Monitoring Program

Resource Component	Purpose of Monitoring	General Methods	Monitoring Period
Heritage Resources			
HR-1	To ensure heritage resource mitigations are successful (impacts of SLDP on heritage resource)	• review of final mine design plans by professional archaeologist • archaeological investigations in advance of development will take place • monitoring during construction (by a professional archaeologist) will take place only if the archaeological survey before construction reveal any sites • ensure areas without archaeological investigations are not disturbed	• pre-construction • construction • pre-construction • all phases of project
HR-2	To ensure heritage resource mitigations are successful (impacts of SLDP on the winter access road)	• review of final alignment plans by professional archaeologist • field examinations will occur prior to construction if alignment changes are proposed • archaeological investigations in advance of development will take place	• pre-construction • pre-construction • pre-construction
Traditional Land Use			
		• no monitoring identified	
Non-Traditional Land Use			
RU-3	To confirm impact prediction of negligible to low environmental consequence of SLDP on natural resources	• monitor trapping activity in the RSA of non-traditional resource users by monitoring registered trapline activity • monitor winter access road for spills, wildlife incidents, resource users (to be developed through consultation)	• all phases • all phases
RU-2	To confirm prediction of low environmental consequences of the SLDP to the potential to establish protected area	• no monitoring identified • De Beers will work with the Protected Areas Strategy Advisory Committee (through its membership in the Chamber of Mines) for the establishment of a protected area in the Coppermine River Upland Ecoregion	
RU-1	To confirm prediction of no impact of SLDP on existing protected ecologically representative areas	• no monitoring required	
Aesthetic Quality			
VQ-1	To confirm the prediction of low environmental consequences on the effect of the SLDP on the visual quality of Snap Lake and environs	• no anticipated monitoring is required	
Tibbitt -Contwoyto Winter Road			
TCWR-1&2	To confirm predictions of low environmental consequences of SLDP effect on the Lockhart Lake camp and the Tibbitt-Contwoyto winter road	• no monitoring identified as it is being done by the Tibbit-Contwoyto Winter Road Joint Venture • traffic volumes related to Snap Lake are monitored through the Joint Venture	
Air Quality			

Resource Component	Purpose of Monitoring	General Methods	Monitoring Period
AQ-1	To confirm the prediction of low environmental consequence for impacts to air quality from air emissions from SLDP	• weather/meteorological monitoring station • monitor total suspended particulates (TSP) with high volume air sampler (Hi-Vol) and/or fine particulate ($PM_{2.5}$ and PM_{10}) using dichotomous partisol sampler • monitor dustfall in snow-free season • snow sampling for winter TSP deposition	• all phases of project • all phases of project • all phases of project • all phases of project
AQ-2	To confirm predictions of low environmental consequence for deposition of acid forming compounds from air emissions from SLDP	• indirect monitoring of acid deposition by sampling pH and water chemistry in local water bodies (see water quality) • No direct monitoring identified	• See water quality
AQ-3	To confirm predictions of no environmental consequences to air quality from construction activities at SLDP	• monitor total suspended particulates (TSP) with high volume air sampler (Hi-Vol) and/or fine particulate ($PM_{2.5}$ and PM_{10}) using dichotomous partisol sampler • monitor dustfall during snow-free season	• all phases of project • all phases of project
AQ-4	To confirm predictions of low environmental consequences on impacts to visibility from the SLDP	• no direct monitoring	• all phases of project
AQ-5	To confirm the Impacts SLDP will have on the production and management of greenhouse gas emissions	• Monitoring greenhouse gas emissions by tracking fuel consumption and blasting activities • Weather station contributes to database of long-term temperature trends	• all phases of project • all phases of project
Noise			
N-1	To confirm the prediction of negligible to low environmental consequences of impacts on environmental noise from SLDP construction	• no monitoring identified	
N-2	To confirm the prediction of low to moderate impacts from operations of SLDP on environmental noise	• spot surveys and 24-hour surveys	• annually
Hydrogeology			
HG-1	To monitor impacts to ground water quantity and levels from the underground mine at SLDP	• monitor groundwater inflow to the mine • monitor water levels in deep monitoring wells to be installed north of the mine (intake located within the talik)	• construction and operations • all phases of project
	To confirm input parameters used in models for mine management and impact predictions	• refine groundwater flow and quantity models if necessary • refine predictions of both future inflow to mine during development and flow velocities and quantity of groundwater affected by post-closure	• all phases of project • all phases of project

Resource Component	Purpose of Monitoring	General Methods	Monitoring Period
HG-2	To monitor impacts to ground water quality from the underground mine for SLDP	• monitor quality of groundwater inflow to the mine • monitor water quality and chemistry in deep monitoring wells to be installed north of the mine (intake located within the talik) – only if water level measurements and model re-calibration indicates that impacts could be greater that presented in EA	• construction and operations • post-closure
	To confirm input parameters used in models for mine management and impact predictions	• monitor groundwater quality to refine groundwater quality models if necessary • refine predictions of groundwater quality and future mine discharge affected by the mine post-closure	• construction and operations • operations
HG-3	To monitor changes in groundwater quantity and levels due to surface facilities of SLDP	• monitor water quantity in wells installed in active layer between North Pile and northwest arm of Snap Lake and in wells located downstream of the WMP • localized summertime monitoring of groundwater flow in the active layer, if deemed necessary • monitor groundwater levels on the northwest peninsula along the north arm	• all phases • all phases • all phases
	To confirm input parameters used in models for mine management and impact predictions	• monitor groundwater quantity and levels to refine water quantity models, if necessary • refine predictions of quantity of groundwater affected by the mine post-closure	• all phases • operations and post-closure
HG-4	To monitor changes in groundwater quality due to surface facilities of SLDP	• monitor water quality in wells installed in active layer between North Pile and northwest arm of Snap Lake and in wells located downstream of the WMP • monitor groundwater quality on the northwest peninsula along the north arm • monitoring piezometers in the North Pile and in the bedrock formation • monitor cryoconcentraiton in north pile through periodic test pit evaluation, salt rejection testing, and thermal monitoring. • monitoring water quality of the North Pile seepage	• all phases • all phases • all phases • construction and operations • all phases
	To confirm input parameters used in models for mine management and impact predictions	• monitor groundwater quality to refine water quality models, if necessary • refine predictions of quality of groundwater affected by the mine post-closure	• all phases • operations and post-closure
Hydrology			
H-1	To confirm prediction of negligible environmental consequence on near-surface water tables and flows, and water levels in receiving streams, lakes and wetlands from SLDP	• monitor stream discharge levels at the outlets of Snap Lake, north lake, northeast lake, reference lake and stream H4 as well as lake elevation of Snap Lake, north lake, northeast lake and reference lake during open water seasons • monitor inflows into the water management pond from underground workings and surface drainages	• all phases • operations
	To confirm input parameters for impact models and mine operations	• monitor quantity of North Pile seepage, collecting in the drainage ditches and reporting to the Northeast Sump	• operations

Resource Component	Purpose of Monitoring	General Methods	Monitoring Period

H-2	To confirm a prediction of negligible environmental consequence on sediment yields and sediment concentrations in receiving streams, lakes and wetlands due to the SLDP	• monitor total suspended solids using Surveillance Network Program stations
		  • treated discharge
		  • Snap Lake
		  • On-site
		  • On-site drainage into Snap Lake and pond water during spring freshet and warm weather periods
			• All phases (including post-closure)

Water Quality			
WQ-1	To confirm the predictions of environmental consequences on surface water quality due to the SLDP	General • conduct an aquatics effects monitoring program to monitor for the status of water quality and aquatic life. Water quality thresholds for action will be specified • testing for acute and chronic aquatic toxicity of treated mine water from the water treatment plant, including a toxicity reduction experiment, if required • acute toxicity tests are conducted on PKC water prior to discharge Snap Lake • monitor sediments in deep areas for long-term accumulation of metals • monitor water quality of mine water inflows to Snap Lake • monitor water quality of Surveillance Program Network stations at mine site • monitoring for pH, total dissolved solids, total suspended solids, temperature, conductivity, nutrients, major ions, and metals Other Water Bodies • monitor reference lake for metals, total dissolved solids and pH • reference lake monitoring will provide information on natural levels and measurable variability Treated Discharge • monitoring for flows, pH, total dissolved solids, temperature, conductivity, nutrients, major ions, metals and acute toxicity Other • on-site drainage into Snap Lake and pond water for pH, total suspended solids and heavy metals during spring freshet and periodically during warm weather period • monitoring of seepage from the North Pile and water management pond for metals, total dissolved solids, nutrients, major ions, and pH	 • construction, operation, closure • construction • all phases of project • operations and post-closure • construction and operations • all phases of project • construction and operations • operations • operations • post-closure • operations, closure, post-closure
	To confirm input parameters for impact models of mixing and to confirm mixing predictions during WMP discharge	• monitor water quality near multi-port diffuser • water samples are colleted at the diffuser outflow in Snap Lake	• operations • all phases of project

Resource Component	Purpose of Monitoring	General Methods	Monitoring Period
WQ-2	To confirm a negligible environmental consequence on the impacts of water quality in the Lockhart River watershed from the SLDP	• monitor the water quality at the Snap Lake Outlet for all parameters (downstream effects)	• operations
WQ-3	To confirm the environmental consequences prediction of acidifying emissions from SLDP on regional waterbodies	• Monitor lakes IL3, IL4, IL5 for pH, metals and total suspended solids • Monitor streams S1 and S27 for pH, metals and nutrients	• operations • operations
Aquatic Life			

F-1	To confirm the impact predictions on the quality and quantity of non-fish aquatic organisms	• conduct an aquatic effects monitoring program to monitor for status of water quality and aquatic life
		  • based on Environment Canada's Environmental Effects Monitoring (EEM) methods and requirements
		  • focus on benthic invertebrates and sediment quality
		  • include zooplankton and phytoplankton
		  • include Snap Lake and a reference lake
			• construction, operations and closure

F-2	To confirm the impact predictions to impacts from SLDP to fish habitat	• monitor total suspended solids in Snap Lake • monitor fish habitat change and utilization around inlet and outlet structures • water quality component covered by water quality monitoring • hydrology component covered by the stream flow and lake level monitoring	• construction, operations and closure • construction, operations and closure • all phases • construction, operations and closure
F-3	To confirm the impact predictions from SLDP on fish health	• monitoring fish health for Snap Lake and a reference lake • based on Environment Canada's Environmental Effects Monitoring (EEM) methods and requirements	• construction, operations and closure • construction, operations and closure
F-4	To confirm the impact predictions to impacts from SLDP on fish abundance	• monitor blasting activities during initial production • Collect additional baseline data for northeast lake • Include benthic invertebrates, fish , zooplankton phytoplankton and sediment quality	• initial production • construction, operations and closure
Geology and Terrain			
GT-1	To confirm the predictions of no to high environmental consequence the SLDP will have on terrain units in the local study area	• reclamation of terrain units by recontouring and placement of reclamation materials to ensure the final topography and site conditions are similar to other terrain units in the region • monitoring of reclaimed land forms to ensure stability • monitor terrain loss using ground surveys and Landsat thematic mapper	• construction, operation and closure • operations and post-closure • operations

Resource Component	Purpose of Monitoring	General Methods	Monitoring Period
GT-2	To confirm the prediction of moderate environmental consequence to the esker quarry and adjacent area	• volumes of material extracted will be recorded during each period of use by pre and post extraction survey and photographs • monitor reclamation and revegetation at esker by annual photographs and ground survey • regular visual inspections by site operation personnel for air quality, stream flows and ground settlement in the immediate area of the quarry • monitoring of total suspended solids in adjacent water bodies during spring runoff • monitor quantity and chemical composition of dust in the quarry area • vegetation plot monitoring for changes in composition, productivity and vigour due to dustfall may be suggested	• operations • operations • operations • operation • operations, years when quarry is active
GT-3	To confirm impacts on seismic characteristics of the region	• no site specific monitoring required – world wide seismic monitoring network exists	
GT-4	To confirm and refine the prediction of low to moderate environmental consequence for impacts to the thermal ground regime from SLDP quarrying	• monitor thermal regime in the vicinity of dams and North Pile using themistors installed in boreholes in the dams, adjacent to the dams and in and around the North Pile • visual inspections of North Pile will be conducted to identify areas of settlement, disrupted drainage or erosion • routine visual inspections of airstrip, roads and building foundations	• operations and post-closure • operations and post-closure • operations
GT-5	To confirm the prediction of no environmental consequences to the presence of ground ice on the stability of the containment structures	• detailed investigations during construction excavations, including Ground Penetrating Radar surveys and test pit excavation to determine if ice lenses or wedges occur on foundation • monitor thermistors in the North Pile and foundation (to determine areas of ground warming) • visual inspections of water collection ditches and toe of North Pile to identify areas of settlement indicative of melting ground ice	• construction • operations and post-closure • operations
GT-6	To confirm the prediction of no environmental consequence on the impact of freeze-back of the North Pile on surface water quality	• visual inspections of the North Pile and annual survey if covered areas will be conducted to identify areas of settlement, disrupted drainage or erosion • monitor temperature within the pile and foundation using thermistors • install thermistors at all ground water monitoring wells in the North Pile area to monitor thermal conditions and seepage performance	• operations and post-closure • operations and closure • operations and closure
GT-7	To confirm the prediction of no environmental consequence on the impacts climate change will have on the development	• routine visual inspection of project infrastructure, include periodic ground survey to identify settlement and photographs	• construction, operations, and closure
Ecological Land Classification and Biodiversity			

Resource Component	Purpose of Monitoring	General Methods	Monitoring Period
ELC-1	To confirm predictions of low to moderate environmental consequence on Ecological Land Classification Units ▪ monitor potential effects of dust on snow melt ▪ develop monitoring protocols for revegetation and reclamation	• monitor airborne particulates and dustfall • monitoring ELC unit loss through ground surveys and Landsat thematic mapper • vegetation plots for diversity (richness and density) and composition including non-natives and invasives • reclamation and permafrost monitoring to assess the impact of reclamation on permafrost depth, extent • using an adaptive management approach to reclamation by incorporating revegetation / reclamation techniques proven successful on site and at other sites in the region	• all phases of project • 5 year increments throughout the project life • at year 3 and after closure on the North Pile; and post closure (25 years) for North Pile and rest of area • part of above program (year 3 through to post closure (25 years) Part of an-going monitoring program, from mow through to closure and beyond (25 years)
ELC-2	To confirm predictions of low environmental consequence that the SLDP will have on biodiversity • develop monitoring protocols for revegetation and reclamation	• monitor airborne particulates and dustfall • monitor permanent and control vegetation plots for diversity (richness and density) and composition including non-natives and invasives • reclamation and permafrost monitoring • using an adaptive management approach to reclamation by incorporating revegetation / reclamation techniques proven successful on site and at other sites in the region Also consider • terrestrial and wetland plots linked to dustfall, toxicity and groundwater level monitoring (also changes in nutrients, pH and salinity) • Assess suitability of abandoned camp for monitoring revegetation success	• all phases until closure • all phases including post closure (25 years) • all phases including post closure (25 years) • all phases including post closure Also, • all phases until closure, for dust, and post closure for water • If suitable, monitor abandoned camp throughout all phases
ELC-3	To confirm predictions of low environmental consequence from direct impacts of air emissions on vegetation (ELC unit) health ▪ potential toxic effects of dust on vegetation (directly and indirectly through snow melt)	▪ monitor airborne particulates and dustfall • snow chemistry analysis • monitor lichens and mosses (potentially other plant species) for metals • Dustfall monitoring linked to vegetation plots monitoring for changes in composition, productivity and vigour due to particulates Also consider • Chemical analysis of particulates	• all phases until closure • all phases until closure • all phases until closure • all phases until closure • all phases until closure
ELC-4	To confirm predictions of negligible environmental consequences from direct impacts that water releases from SLDP will have on vegetation (ELC unit) health	• monitor airborne particulates and dustfall • wetland monitoring (uptake of chemicals or metals, change in nutrients and salinity) • terrestrial and wetland plots linked to dustfall and surface and ground water quality monitoring	• all phases until closure • all phases including post closure (25 years) • all phases including post closure (25 years)

Resource Component	Purpose of Monitoring	General Methods	Monitoring Period
Wildlife			
W-1	To confirm predictions of low environmental consequence to impacts SLDP will have on wildlife habitat ▪ effects of fugitive dust on vegetation and forage for wildlife ▪ determine effects of mining on indirect habitat loss	• monitor airborne particulates and dustfall • monitor direct loss of habitat from project footprint • use of existing knowledge from SLDP and other projects to develop habitat suitability index models for caribou and grizzly bears • continue visits to project by Elders and meetings between De Beers and communities	• all phases of project • construction, operations and post-closure • ? • all phases of project
W-2	To confirm the low environmental consequence of the SLDP on wildlife movement and behavior	Wildlife surveys using standardized and accepted methods at the Ekati and Diavik mines • Caribou • Northern and Post-calving migrations monitored by aerial surveys of regional study area. • Data collected includes numbers, group composition, behaviour, location of groups, density of snow tracks • Movements of satellite-collared caribou (data supplied by RWED) • Grizzly Bears • Habitat surveys for grizzly bear sign (tracks, digs, scat) in spring and summer • Wolverines • Monitoring for wolverine presence by annual snow track survey. Information collected includes location, direction and number of tracks. • Investigating possibility of new survey technique • Wolves • Den surveys to determine occupancy and pup production • Falcons • Nest site surveys of gyrfalcons and peregrine falcons to determine occupancy and number of young produced. • Wildlife sightings log and incidental observations • continue visits to project by Elders and meetings between De Beers and communities	• all phases of project • all phases of project • all phases of project • all phases of project • all phases of project • all phases of project • all phases of project

Resource Component	Purpose of Monitoring	General Methods	Monitoring Period
W-3	To confirm the prediction of low environmental consequence that the SLDP will have on wildlife abundance	• monitor for mine-related mortality of caribou, grizzly bears, wolverines, wolves and falcons and non-VECs (e.g., black bears, foxes, moose, ptarmigan)	• all phases of project
		• monitor landfill and waste management practices (i.e. the efficiency of the waste management program over the life of the mine)	• all phases of project
		• monitor wildlife-human interactions	• all phases of project
		• monitor effects of increased access from the winter and esker roads on wildlife abundance • obtain hunter/trapper data from outfitting camps and GNWT to monitor potential impacts of increased access from winter and esker access roads	• all phases of project
		• monitor for habituated wildlife	• all phases of project
		• monitor disturbed area to confirm impact predictions to breeding birds	• all phases of project
Environmental Health			
EH-1&2	To confirm the prediction that health risk to wildlife and adverse effects to human health are not expected to occur	• TSP and dustfall monitoring (conducted by air quality team)	• see air quality
		• Monitoring lichens and vascular plants for metals and PAHs	• construction, operations, closure
		• Linking ground and surface water quality monitoring	• see water quality and hydrogeology sections