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November 9, 2001

Your file / Votre référence

Our file / Notre référence

BY FACSIMILE: (867) 873-9636

Vern Christensen
Executive Director
Mackenzie Valley Environmental Impact Review Board
PO Box 938
YELLOWKNIFE, NT X1A 2N7

Dear Mr. Christensen:

I am writing in response to your staff's email of October 15, 2001 requesting INAC's assignment of "division of labour" including self-identification of "lead reviewer" on a line by line basis. INAC has reviewed the Terms of Reference (TOR) and has provided the following feedback on the TOR assigned expert advisors (see attached EXCEL spreadsheet).

INAC does not agree with expert advisors taking on the role of "lead reviewer" and is of the opinion that this a significant role in the environmental assessment and should be the sole responsibility of the Review Board staff. INAC does not coordinate expert evaluations from other responsible Ministers and it cannot ensure that comments are accurately represented to the Review Board.

INAC will review the EA Report and intends to provide technical advice in the context of its legislated and mandated responsibilities to Aboriginal people and northerners. The attached spreadsheet indicates the areas in which it is currently INAC's intent to provide technical advice. However, we advise that INAC is not to be viewed as legally binding itself to the provision of expert advice in the areas indicated, or at all. Please note that INAC may change its intentions in this regard as a result of many factors including policy changes, the availability of funding or the accessibility of expertise. As well, INAC may later choose to evaluate other pertinent sections that may be linked to its mandate notwithstanding it has not currently indicated its intention to do so.

I wish to thank you for initiating this exercise as it will help ensure that no gaps exist in your expert evaluation of the De Beers Snap Lake Diamond Mine EA Report.

If you require further clarification, please do not hesitate to contact me or Tamara Hamilton at 669-2616.

Yours sincerely,

David Livingstone, Director
Renewable Resources and Environment

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Canada

Line Numbers	Terms of Reference	Government Reviewer with Expertise/Advice	INAC Response
1-3	***Environmental Assessment Terms of Reference for the De Beers Canada Mining Inc. Snap Lake Diamond Project***		
4	***2.1 Purpose of the Proposed Terms of Reference***		
5-6	The Environmental Assessment Report (EAR) will address the following Terms of Reference. The EAR will assist the Review Board in understanding the environmental consequences of the proposed development.		
8-13	The ToR describes the Review Board's expectations of De Beers for the use and integration of public consultation and traditional knowledge in the EAR and throughout the EA process. The Review Board has determined what it considers to be the development, and to what extent the interactions between components of the proposed development and the environment will be looked at in the EA. The Review Board also requests that De Beers demonstrate its capacity, ability and commitment to undertake the proposed development in an environmentally, safe and sustainable manner.		
15-18	All public documentation related to this proposed development is available on a public registry file that is maintained by the Review Board. The EAR and all other submissions to the public registry will be used by the Review Board in its decision, reasons for the decision and report of environmental assessment.		
19-21	This EA will be conducted according to Part V of the Mackenzie Valley Resource Management Act (Act). De Beers shall refrain from making any conclusions regarding the significance of impacts on the environment. The Review Board shall make the final determination of significance.		
22	***2.2 Public Consultation and Traditional Knowledge***		
23	***2.2.1 Public Consultation***		
24-26	The purpose of public consultation is to provide those who could be affected by the proposed development the opportunity to participate in the environmental assessment. As a minimum, the residents, First Nations and Metis, in Lutsel K'e, Dettah,		
27-28	This does not prevent De Beers or the Review Board from including industrial, recreational, environmental, and other individuals, groups and organizations who have an interest in the proposed development.		
30-31	De Beers shall provide regular public notification that it is preparing an EAR and advise the public of opportunities to provide		
33-34	De Beers shall describe its public consultation policies, objectives, programs and activities undertaken and committed to regarding:		
35	I. methods used to identify, inform and solicit input from potentially interested parties;	GNWT	
36	II. those who provided comments and input;	GNWT	
37	III. outcomes of consultation including any additional information provided by those consulted;	GNWT	
39	IV. concerns identified;	GNWT	
40	V. differences in views between those consulted;	GNWT	
41	VI. agreements or commitment to agreements with interested participants and/or communities;	GNWT	
42	VII. issues tracking; and		
43	VIII. verifiable, documentation of how consultation affected impact prediction and mitigation, and affected the design of the proposed development.	GNWT	

45	***2.2.2 Traditional Knowledge***				
46-48	De Beers shall make all reasonable effort to collect and facilitate the collection of traditional knowledge relative to the proposed development, for integration into the environmental assessment report in collaboration with Aboriginal communities and organizations.	All			
48-49	De Beers shall describe where and how traditional knowledge was used and the effect that it had on predicting impacts and determining mitigation.	GNWT			
49-51	Where traditional knowledge is not available, or not provided to De Beers in a timely manner despite appropriate diligence, De Beers shall describe efforts taken to obtain it.	All			
51-52	Traditional Knowledge is given full and equal consideration to that of western science.	All			
54-55	DeBeers shall present both the scientific and traditional perspectives on predicted impacts wherever both types of information are available, and should refrain from weighing the relative merits of predictions	All			
56	***2.3 SCOPE OF THE DEVELOPMENT***				
58-59	The Review Board is required to provide a scope of development determination according to ss.117(1) of the MVRMA. This section describes what the Review Board considers the scope of the development.				
60	***2.3.1 Principle Development***				
61	The Principle development is the underground mining of kimberlite ore.				
62	***2.3.2 Accessory Development***				
63	The accessory undertakings and developments associated with the principle development include:				
64	***2.3.2.1 Mined Rock***				
65	I. storage and handling of waste rock;				
66	II. storage and handling of processed kimberlite;				
67	III. processing of the kimberlite ore for the removal of diamonds;				
68	IV. removal of the diamonds from the minesite; and				
69	IV. removal of waste rock, kimberlite and mine water from the underground workings.				
70	***2.3.2.2 Water Management***				
71	I. storage, handling of mine water;				
72	II. surface water management;				
73	III. removal of water from Snap Lake for use at the mine site; and				
74	IV. reintroduction of managed water into Snap Lake.				
75	***2.3.2.3 Transport and Surface Structures***				
76	I. use of the current Lupin winter road;				
77	II. the winter road spur off the Lupin winter road to the mine site;				
78	III. proposed all-weather road to the esker to the south of the development;				
79	IV. airstrip and support infrastructure for air travel;				
80	V. Solid waste management and containment areas;				
81	VI. Surface structures (process plant, power plant, magazines, camp(s), roads, airstrip, etc.); and				
82	VI. Petroleum and chemical storage areas.				
	2.3.2.4 Existing Snap Lake Diamonds Project Advanced Exploration				

84-90	Changes to existing advanced exploration facilities, infrastructure and undertakings needed to accommodate the proposed development. Only include changes not permitted in previous licences or permits. Where De Beers demonstrates that existing Land User Permit(s), Water Licence(s), or other authorizations adequately address environmental impacts of the proposed changes in existing infrastructure or undertakings, De Beers is not be required to specifically address those impacts in the scope of development but in the cumulative effects section (4.9 Cumulative Impacts) of the environmental assessment.	MVLWB INAC GNWT
92-93	For emphasis, developments included in the environmental assessment include, but are not necessarily limited to the following:	
95-96	Decommissioning and, or, modification of the Snap Lake advanced exploration camp including but not limited to the following.	
97	1. Temporary explosive storage building(s) and access roads	
98	2. Portable crusher and a rock/esker material stockpile	
99	3. Airstrip	
100	4. Temporary underground contractor facilities	
101	5. Bulk sample process plant	
102	6. Underground bulk sample	
103	7. Mine portal	
104	8. Processed kimberlite containment area	
105	9. Dams to contain the kimberlite containment area	
106	10. Potable water intake and pump house	
107	11. Fuel tanks	
108	12. Pilot plant facilities	
109	13. Cold storage	
110	14. Camp and office complex	
112	Development of the Snap Lake Diamond Project.	
113	1. Explosive storage with associated roads	
114	2. Landfill for non-hazardous solid waste	
115	3. Portable crusher and a rock/esker material stockpile	
116	4. Mine water clarification pond	
117	5. Mine water clarification pond discharge point into Snap Lake	
118	6. Dams to contain mine water clarification pond	
119	7. Sewage treatment plant	
120	8. Power plant	
121	9. Permanent camp complex	
122	10. Service complex	
123	11. Unheated storage building	
124	12. Process and paste plant	
125	13. Crushed kimberlite ore storage	
126	14. Cement storage	
127	15. Aggregare crushing and batch plant	
128	16. Underground crusher	

129	17. Conveyor used to transport diluted kimberlite ore to surface			
130	18. Kimberlite ore stockpile area			
131	19. Ventilation points			
132	20. Underground mining			
133	21. Mine portal			
134	22. Fuel tanks			
135	23. Potable water intake and pump house			
136	24. Mine waste rock haul road			
137	25. Propane storage area			
138	26. Pilot plan facilities			
139	27. Container storage			
140	28. Cement storage			
141	29. Lupin and mine access winter road			
142	30. Seepage and collection ponds			
143	31. Sumps			
144	32. Berms			
145	33. Quarry and esker excavation areas			
146	34. Acid generating rock disposal area			
147	35. Non-acid generating rock disposal area			
148	36. Processed kimberlite disposal area			
149	37. Hazardous waste disposal			
150	38. Site transportation routing			
151	39. Contractors lay down area			
152	***2.4 Related Considerations***			
153	***2.1.1 Hazardous Materials***			
154-155	The risk and potential impacts associated with handling, storing, using, and disposing of hazardous materials forming part of the proposed development, including:	All		
156-157	i. location for hazardous or contaminated materials and details on how hazardous materials will be managed; and,	All		
158-159	ii. the identification and description of all contaminant sources resulting from the project and their related pathways to the receiving environment.	All		
160	2.1.2 Accidents and Malfunctions			
161-162	Clearly, explain the probability and potential magnitude of an accident and/or malfunction occurring, and the resulting impacts on the proposed development, including the underground workings. Link the outcome of the accident and malfunction probability analysis to consequential impacts to the environment.	All		
162-163	Link the outcome of the accident and malfunction probability analysis to consequential impacts to the environment.	All		
164	***2.4.3 Closure and Reclamation***			
165-166	De Beers shall explain its closure and reclamation approach and to what standards it will reclaim (i.e. stable land forms, revegetation, return to previous ecological productivity?).	All		

168-170	Based on proposed closure and reclamation intentions De Beers shall report the present day Canadian dollar value of reclamation costs associated with the closure and reclamation, including alternative approaches considered, of the proposed development as reported in section 2.3 Scope of Development.	INAC GNWT ~~NRCan~~	
	2.5 Environmental Assessment Methodology		
172-176	De Beers shall provide information on the environment and how it could be affected by the proposed development. De Beers should also provide a sufficient base for the prediction of positive and negative impacts. De Beers shall demonstrate the extent to which negative impacts may be mitigated and positive impacts augmented by planning, development design, construction techniques, operational practices and reclamation techniques.		
176-179	De Beers will refrain from providing significance conclusions in the EAR report. De Beers shall provide quantitative information to the extent possible regarding the nature of predicted environmental impacts. Where professional or traditional knowledge expertise is applied, an explanation of the soundness of those views shall be provided.[1]The Review Board has the final say on significance.	All	
181-182	Explicit documentation of the assumptions, models, information sources used, as well as information limitations and associated levels of uncertainty should support all steps of the environmental assessment report.	All	
184-186	The analysis should be quantitative where data are available, but where data or models are lacking, best professional and, or, traditional knowledge judgment may be used. The approach and methodologies used to identify and assess cumulative effects should be explained.	All	
187	***2.5.1 Alternatives to Carrying out the Development***		
188-189	Include a description of the main development/production/technical alternatives, in particular, those associated with the following:	NRCan/INAC	
190	I. mining methods;	INAC NRCan	
191	II. waste rock and tailings management;	INAC, NRCan	
192	III. mine water management;	GNWT	
193	IV. energy production (i.e., diesel generation);	All	
194	V. decommissioning and reclamation;	~~NRCan~~ /INAC	
195	VI. mine production rates;	GNWT	
196	VII. employee work schedules;	~~NRCan~~ /INAC	
197	VIII. mine development scheduling; and		
198-199	IX. Employee/worker living conditions e.g. living quarters, leisure facilities, food, visitors, access to outdoors, etc.	GNWT	
201-207	Where alternatives that would mitigate impacts on the environment and, or, enhance the socio-economic performance of the proposed mine are deemed not economically feasible, the economic analysis to determine feasibility should also be summarized and made available to the public. The Review Board may request that De Beers provide, in confidence, all supporting documentation in support of its conclusions. De Beers shall discuss the option of sorting and marketing the diamonds mined at the proposed mine. This should include a clear explanation of the options considered and the reason for selecting the preferred option.	INAC, NRCan and GNWT and others as necessary	
209-211	De Beers shall discuss alternative water treatment options considered, that can from an engineering standpoint, be used at the Snap Lake project for any mine water, waste rock seepage, or process water that will be discharged into Snap Lake.	INAC GNWT EC and NRCan	
212	***2.5.2 Description of the Existing Environment***		

213-216	De Beers shall provide a brief and clear textual and graphic depiction of the existing environment and its use, as it pertains to the potential impacts of the proposed development. The existing environment includes the resources being extracted over the predicted life of the mine, and contemporary/past land use and occupancy in the region, whether industrial or aboriginal.	All	
218-219	All existing reports and documents shall be appropriately referenced. De Beers will be expected to clearly and succinctly describe the following environmental components, as they relate to the proposed development:		
220	I. air and climate;	GNWT and EC	INAC will comment on linkages to hydrology
221	II. surface and ground water quality and quantity;	INAC, EC and NRCan	
222	III. aquatic organisms and habitat;	DFO and EC	
223	IV. wildlife and wildlife habitat, including migratory birds;	GNWT	
224	V. vegetation and plant communities;	EC and GNWT	
225-226	VI. terrain, surficial geology, bedrock geology, seismicity, geological hazards, permafrost, soils, and lake sediments;	NRCan /INAC	
227	VII. structural geology	NRCan/INAC	
228	VIII. human health;	GNWT	
229	IX. economy;	GNWT	
230	X. employment, education and training;	GNWT	
231	XI. infrastructure;	GNWT	INAC will comment to a limited extent
232	XII. government revenues, cost; and	GNWT/INAC	
233	XIII. social and cultural resources.	GNWT	
234	***2.5.3 Spatial and Temporal Boundaries***		
235-236	De Beers shall explain the rationale for its selection of 'spatial boundaries' (i.e., project related, local and regional scope) and 'temporal boundaries.'	All	
238-240	Spatially, boundaries shall reflect the maximum zone of influence of the proposed development for each valued ecosystem component (VEC) selected. De Beers shall provide a discussion of how the "maximum zone of influence of the proposed development for each valued ecosystem component" is determined.	All	
242-245	Temporally, De Beers shall assess environmental impacts of the proposed development for all phases of the proposed development including construction, operation, closure and post-closure. Provide sufficient detail to address the relevant impact issues on VEC's over the entire temporal scope of the development. Distinguish between biological, physical, social, cultural and economic parameters.	All	
247-248	The scope of the assessment for socio-economic variables should include communities that could reasonably expect to experience impacts because of the development, including but not limited to, increased traffic volumes or employment and business opportunities.	GNWT	
250	***2.5.4 Impact Description and Predicted Outcomes after Mitigation***		
251-254	Describe the direct and indirect impacts resulting from the proposed development, after mitigation. Describe the impacts[1] so that people reading the report can easily understand how De Beers figured out what the impacts would be, how sure De Beers is of its conclusions, and what those impacts mean for future generations in the Mackenzie Valley. Do not provide any conclusions regarding the significance of the impacts.	All	

256-260	Information gaps should be identified along with reasonable and suggestions to remedy them. De Beers shall describe each impact identified and the proposed mitigation measure(s) for all phases of the proposed development (i.e., construction, operation, closure and post-closure). De Beers shall describe planned mitigation measures and consequences (environmental impacts) of potential failure. The residual impacts should be described at least in terms of the following parameters.			All	
261		I.	magnitude;		
262		II.	geographic extent;		
263		III.	timing;		
264		IV.	duration;		
265		V.	frequency;		
266		VI.	irreversibility of impacts;		
267		VII.	ecological resilience; and		
268		VIII.	probability of occurrence and confidence level.		
270	Distinguish between ecological parameters and social / cultural parameters.			All	
271	***2.5.5 Environmental Optimization***				
272-276	The EAR should report the comparative present day Canadian dollar costs of proposed development alternatives and the corresponding environmental benefits. Any assumptions or uncertainty surrounding implementation of mitigation measures, such as untested technology, will be reported. The reporting of development impacts should provide readers with an easy to understand summary of present day Canadian value costs of alternatives and their corresponding future environmental benefits.			GNWT, NRCan, INAC, DFO, EC	
277	***2.6 Environmental Impacts***				
278-279	The environmental assessment report should report impacts resulting from the proposed development on the physical, biological and social, economic and cultural components of the environment.				
280	***2.6.1 Air Quality and Climate***				
281-285	Report the impacts of the proposed development on air quality. The analysis should include a discussion of measures considered to minimize the release of air contaminants (dust, particulate exhaust fumes and other air contaminants). Climate should include not only the average or mean values but also the extremes that can be expected. The full range of weather conditions should be investigated. The analysis should also include:			EC and GNWT	
286		I.	atmospheric dispersion of emissions on a local and regional scale;	EC and GNWT	
287-288		II.	greenhouse gas emissions including, but not limited to, CO_2 and CH_4, and All green house gas accounting should be done in CO2 equivalent values;	EC and GNWT	
289-290		III.	acid deposition and impact of the acidic precipitation resulting from release of gasses such as NOx and Sox; and	EC and GNWT	
291		IV.	impact on biological receptors such as vegetation and wildlife;	EC and GNWT	
		I.	wildlife;		
292	***2.6.2 Terrain***				
293-295	The environmental assessment shall provide a detailed description of the ground and permafrost conditions at the site including a description of surface materials and geology, ground ice content, a description of permafrost configuration including the frozen/unfrozen interfaces in the underground portion of the mine.			NRCan/ INAC	and geology , and the permafrost configurations.
297-298	Report the impacts on the environment when surficial geology, bedrock or soils are disturbed or used for construction purposes. The analysis shall include:			NRCan	

299	I. the proposed development's impact on the thermal milieu, including:	NRCan
300-301	a. impact on permafrost physical conditions (including physical strength characteristics) and thermal regime;	NRCan
302-303	b. impact of modified permafrost temperatures and ground ice conditions underground in the mine and above ground on roadway, waste rock piles, etc..;	NRCan
304	c. impact of thermal erosion in relation to altered drainage;	NRCan
305	d. impact of ice wedge occurrences beneath containment structures;	NRCan
306	e. impact of frost heave;	NRCan
307-309	f. impact of the water content contained in the processed kimberlite deposited in the north pile and the potential for pore-water expulsion during freeze back of the pile; and,	NRCan
310	g. the impact of climate change on the above.	NRCan and EC
311-312	II. impacts of aggregate use including limitations on volumes of resource material and minimization of terrain disturbance associated with ground ice thaw;	NRCan and INAC
313	III. rock types, including the chemistry and stability of kimberlite by- products;	NRCan and INAC
314	IV. seismicity and potential for rock heave;	NRCan
315-316	V. quantity and sulphuric concentration of potentially acid-generating material and the resulting impacts of acidic generating material;	NRCan, EC, GNWT and INAC
317	VI. acid rock drainage and seepage potential and associated mitigation;	NRCan, EC, GNWT and INAC
318	VII. impact of remedial actions at the mine site (waste dumps, tailings); and	NRCan, EC, GNWT and INAC
319-320	VIII. impact of quarry development at esker including gravel, sediment, overburden and aggregate use;	NRCan, EC, GNWT and DFO/ INAC
322-325	As the North Pile will be the location for the disposal of a variety of materials including solid inert waste, sewage sludge, mine rock and processed kimberlite. Report the impacts on the environment of the interaction of these materials, including long term management plans for ensuring the stability of the material.	NRCan, EC, GNWT and INAC
327-329	Report the impacts on the environment of the esker quarry south of the minesite. Include information on the timing and amounts of material required over the life of the diamond mine, the size of the esker, extractable quantities, and a quarry management plan suitable for environmental assessment purposes.	GNWT and INAC
330	***2.6.3* Vegetation and Plant Communities**	
331	The EAR should analyze impacts of the proposed development on:	
332	I. local plant communities (classified as vegetation cover types);	GNWT and EC
333	II. rare or highly valued species;	GNWT and EC
334	III. long-term, direct and indirect, habitat loss or alteration; and	GNWT and EC
335	IV. vegetation productivity.	GNWT and EC
336	***1.1.1* Water Quality and Quantity**	

337-341	The environmental assessment report shall provide an analysis of proposed development impacts on surface and ground waters. Impact conclusions should be the based on predicted water quality of all waste streams and containment ponds throughout the project, including mine water, seepage, surface runoff and collection ponds, process plant discharges, the minewater settling pond and the sewage treatment facility. This analysis should include the impacts on water quality and quantity, catchment areas and permafrost in relation to:	INAC, EC, DFO, NRCan	
342-343	I. impacts of underground blasting and its associated residues, in particular, nitrogen, nitrate, nitrite and ammonia;	INAC, EC, DFO and NRCan	
344	II. water from underground mine workings and site runoff;	INAC, EC, DFO and NRCan	
345-.350	a. provide a detailed characterization of geochemical influence on inflowing groundwater from all potential sources, including: mine rock exposed on underground walls, materials temporarily stored underground (muck, ore and /or waste rock); and water released or leached from backfill (kimberlite paste, quarried rock concrete and mine	INAC, EC, DFO and NRCan	
351-355	b. Provide a description of the predicted mine inflows and underground hydrogeology, water handling procedures, water balance predictions and contingencies for potential higher than expected flows, impacts of discharges on the hydrology of the lake and water balances for waste water containment facilities including contingencies and excess holding capacities.	INAC, EC, DFO and NRCan	
356-357	III. impact on water quantity, including changes in timing, volume and deviation of peak and minimum flows resulting from the development;	INAC, EC, DFO and NRCan	
358-362	a. provide a detailed description of predicted mixing zones in Snap Lake for any effluents discharged from the development. De Beers shall provide its assessment of water quality (metals, nutrients, major ions, process chemicals, bacteria, physical characteristics) within and at the boundaries of the mixing zone and criteria used to establish the mixing zone.	INAC, EC, DFO and NRCan	
363-367	b. De Beers shall provide a description of the predicted impacts of releases of any effluents, surface runoff and seepages that may be directed to land (include consideration of surface ponding), with particular attention to impact linkages on vegetation, soil and wildlife. Ensure that criteria used to predict impacts are explicit and precautionary.	INAC, EC and DFO	
368	IV. impact of treated sewage flows to associated wetlands and downstream waters;	INAC, EC, DFO and GNWT	
369	V. siltation effects (e.g., runoff along roadways and drainage channels);	DFO, EC and INAC	
370-371	VI. effects of nutrients on fish and non-fish bearing water sources, including possible trophic status changes of Snap Lake;	DFO and EC	
372-373	VII. dewatering of underground workings and resulting impacts on the water balance, Snap Lake water level, outflow rates, etc.;	EC and INAC	
374	VIII. impact of development on the water shed;	EC and INAC	
375-376	a. provide a detailed description of the hydrology of the Snap Lake watershed including an overview of the Lockhart River Drainage basin.	EC and INAC	
377-378	IX. impact of the use of berms for waste water containment including impacts of berm materials, berm construction leaching from the berm itself, and seepage through the berm;	NRCan, EC, DFO, INAC	
379	X. water chemistry impacts of surface runoff;	EC, INAC, DFO	

380	XI.	EC, INAC, DFO	
381	XII.	EC, INAC, DFO	
383-385	All parameter estimates (e.g. water balance), reported by DeBeers should include tractable, the source of information (either estimates or empirical), assumptions built into the data, and data reporting that includes ranges and confidence estimate for parameters.	NRCan, EC, DFO, INAC	
386	*2.6.4.1 Water Balance*		
387-388	A water balance should be prepared that incorporates all components of the proposed development under a range of climactic conditions.	EC, DFO, INAC	
389	*2.6.4.2 General Water*		
390	The assessment of proposed development impacts on water quality should also consider:		
391	I. contaminant loading and dispersion (including surface runoff and airborne contaminants);	EC, DFO, INAC, NRCan	
392	II. acid rock drainage, metal leaching and geochemistry; and	EC, DFO, INAC, NRCan	
393	III. kimberlite toxicity and implications for aquatic wildlife.	DFO and EC	
394	***2.6.5 Aquatic Habitat***		
395-397	The impacts on aquatic organisms and their habitat should be considered taking into account predicted water quality and quantity impacts and their associated effects on fish, fish habitat, and local drainage patterns. The analysis of development impacts should include:	EC and DFO	
398-399	I. productive capacity of aquatic systems during construction, operations, closure and post-closure;		
400-401	II. impact on all lakes that may experience changes to fisheries resources including, but not limited to Snap Lake and streams associated with these lakes;	DFO	
402	III. habitat loss or alteration;	DFO	
403	IV. rare and/or sensitive fish species and habitat;	DFO	
404	V. mortality (includes fishing);	DFO	
405	VI. impacts of underground blasting on fish and fish habitat on local aquatic systems; and	DFO	
406-408	VII. impacts on all lakes and associated food webs and water use potential that may be impacted by changes in water chemistry (nutrients, bacteria, major ions, metals) due to runoff or discharges from the development.	DFO and EC	
410-412	The environmental assessment report should include an overview of how the DFO, 1986 principle of No Net Loss will be achieved during the construction, operation, care and maintenance and closure stages of the proposed development.	DFO	
413	***2.6.6 Wildlife and Wildlife Habitat***		
414-417	The environmental assessment report should provide an analysis of the proposed development's impacts, (both direct and indirect), on wildlife and wildlife habitats, including migratory birds, giving consideration to and demonstrating linkages between predicted physical and biological changes resulting from the proposed development.	GNWT	
418-420	De Beers shall provide its informed view of "ecologically representative areas" in the ecoregion as defined in the NWT Protected Areas Strategy, as may be required for any adequate monitoring of impacts, and report potential impacts by the proposed development on those ecologically representative areas.	GNWT	
422-423	De Beers shall also give special consideration to species identified in COSEWIC listing as "Endangered," "Threatened" and of "Special Concern." The analysis of development should include:	GNWT and EC	
424	I. impact of loss of terrestrial habitat, and the quality of lost habitat for relevant species;	GNWT and EC	

425	II. disturbance of feeding, nesting, denning or breeding habitats;	GNWT and EC	
426	III. wet-land habitat alteration, loss;	GNWT and EC	
427	IV. physical barriers to wildlife;	GNWT and EC	
428-429	V. disruption, blockage, impediment and sensory disturbance, of daily or seasonal wildlife movements (e.g., migration, home ranges, etc.);	GNWT and EC	
430-432	VI. rare, vulnerable, threatened or endangered species as outlined in the Canadian Organization of the Status of Endangered Wildlife in Canada (COSEWIC), as well as, species of international significance;	GNWT and EC	
433	VII. direct wildlife mortality;	GNWT and EC	
434	VIII. indirect wildlife mortality;	GNWT and EC	
435	IX. reduction in wildlife productivity; and	GNWT and EC	
436	X. implications of the proposed development acting as an attractant for particular species.	GNWT and EC	
437	*2.7 Social, Economic and Cultural Components*	GNWT	
438	*2.7.1 Cultural and Heritage Resources*	GNWT	
439-441	Describe potential impacts of the proposed development on cultural and heritage resources. Potential impacts on the cultural well being of the impacted communities should include, for example, anticipated or possible changes on social cohesiveness or language use.	GNWT	
442	*1.2.2 Land and Resources Use*	GNWT and INAC	INAC will comment on land disposition only.
443-444	Analyse and describe the proposed development's impact on land and resource uses potentially impacted by the proposed development.	GNWT	
446-449	De Beers shall submit its informed view of "ecologically representative areas" in the ecoregion as defined in the NWT Protected Areas Strategy, as may be required for any adequate monitoring of impacts at a regional scale. Include maps and, or, verbal descriptions of existing and past land and resources uses in relation to the proposed development. For additional clarity, include at least the following land and resource uses:	GNWT, INAC and EC	INAC will comment on land disposition if required
450	I. rare or ecologically significant areas;	GNWT, EC	
451	II. traditionally significant areas;	GNWT, EC	
452	III. seasonal camp areas;	GNWT, EC	INAC will comment on land disposition if required
453-454	IV. permanent camp areas, including the Lupin winter Road and maintenance camp at Lockhart Lake; and	GNWT, EC	INAC will comment on land disposition if required
455	V. hunting, trapping, outfitting, recreational, tourism, commercial and sport fishing areas;	GNWT, EC	INAC will comment on land disposition if required
456	*2.73 Economy*	GNWT	
457-458	The impact of the proposed development on the economy, having regard to direct, indirect and induced impacts on income and employment. Consideration shall be given to:	GNWT	
459-460	I. wage and salary employment by skills category over the life of the proposed development, including estimates of northern participation;	GNWT	
461	II. availability and use of skilled workers in the NWT to meet job requirements;	GNWT	
462-464	III. opportunities for local, regional and territorial businesses to supply goods and services both directly to the proposed development and to meet the demand created by the expenditure of contractors and new employees;	GNWT	
465-467	IV. barriers to employment, advancement, and retention of northern workers, including the training or retraining necessary for sections of the northern workforce to meet De Beers employment standards (i.e. former Con or Giant employees);	GNWT	

468-469	V. opportunities to diversify the northern economic base to produce and to supply new goods and services;	GNWT	
470	VI. barriers to employment;	GNWT	
471	VII. impacts on the subsistence economy;	GNWT	
472	XIII. federal and territorial revenues and costs;	GNWT/INAC	INAC will comment on federal revenues and costs
473	XIV. economic diversification and sustainable economic development;	GNWT/INAC	INAC will comment on the sustainable economic development
474	XV. impacts on the national and territorial Gross Domestic Product (GDP);	GNWT	
475	XVI.	GNWT	
476	XVII. local government finances;	GNWT	
477	XVIII. inflation and the cost of living impacts; and	GNWT/ INAC	
478	XIX. economic diversification.	GNWT	
480-481	De Beers shall, for the diamond resource included within the scope of the environmental assessment, report the following:	GNWT	
482	I.	GNWT/INAC	
483-484	II. planned annual resource extraction rates, reported in carats, and present day Canadian dollars; and,	GNWT	
485-486	III. the impact of planned extraction rates and total resource extraction over the life of the proposed diamond mine on items II, III, V, VII, VIII, IX, X, and, XIV above.	GNWT/INAC	INAC will comment on the federal aspects only.
488-491	De Beers shall provide a detailed summary of its employment commitments, and minimum skill requirements for its predicted labour force, including contract and subcontracted employees. De Beers shall assess the impact of its employment commitments and minimum skill requirements on the labour force in the Northwest Territories.	GNWT	
492-495	De Beers shall also report how federal and territorial governments intend to, or have committed to assisting De Beers achieve its employment commitments and the impact not securing the intended or committed assistance from governments.	GNWT/ INAC	INAC will comment on the federal aspects only.
496	***2.7.4 Human Health***		
497-498	The environmental assessment report shall analyze the potential development impacts upon the physical, mental, spiritual and cultural health of employees, their families and communities.	GNWT	
499	***2.7.5 Government***		
500-503	Assess the impacts of the proposed development on revenues, costs and net income accruing to federal and territorial governments. Report the net incremental benefits or costs to these governments arising from the proposed development. De Beers should also report other fee structures/costs it will incur such as quarry royalties, security deposits, abandonment, and restoration costs resulting from the proposed development.	GNWT/INAC	INAC will comment on the federal aspects only.
505-506	For clarity, provide a balance sheet or other appropriate accounting presentation of the total present day Canadian dollar value of federal and total territorial finances resulting from the proposed development.	GNWT/INAC	INAC will comment on the federal aspects only.
507	***2.7.6 Infrastructure***		
508-510	Assess the impacts of the proposed development on existing social, institutional and community services, transportation facilities, services, infrastructure (e.g., transportation safety), and permanent changes to the infrastructure and services arising from the proposed development.	GNWT	
511	***2.7.7 Noise***		
512-513	Assess the impact of the proposed development on the environment resulting from changes to ambient noise levels, and the effect of these changes on humans and wildlife.	GNWT	
514	***2.7.8 Visual and Aesthetic Resources***		

515-516	Assess the visual and aesthetic impact of the proposed development. Report design components that mitigate visual and aesthetic impacts.	GNWT/~~NRCan~~	INAC will comment on impacts to land
517	***2.8 The Effect(s) of the Environment on the Proposed Development***		
518-525	De Beers should assess the effect(s) of the environment on the proposed development, and activities forming part of the proposed development. De Beers should consider the full range of climate conditions (including extreme weather events, wet, dry and normal precipitation and extreme temperature spells) and climate change (e.g. global warming scenarios). The discussion must specifically describe and assess how the potential for climate change, and extremes in current climate could affect permafrost and soils with high ice content in relation to the integrity of the proposed development infrastructure, particularly the tailings (processed kimberlite) containment impoundment, water retention dikes, the winter road and waste rock piles.	All	
526	***2.9 Cumulative Impact***		
527-532	For the purposes of this development, the environmental assessment should include an evaluation of cumulative effects that are likely to result from the proposed development in combination with other developments; and developments within the regulatory process on the day these Terms of Reference are issued. De Beers shall consider existing forecasting models of cumulative infrastructure development, where such models are available, and can be calibrated to the regional ecosystem encompassing the proposed development. Report the models considered.	All	
534-539	De Beers should include, as a minimum, the existing Snap Lake Advanced Exploration Program and other identified developments including but not limited to existing tourism operations in the region, the BHP Ekati™ Diamond Mine (including the expansion), Diavik Diamond project, ™ and the Echo Bay Mines ™ also report and describe developments considered but not included in the cumulative effects assessment, and rationale for the decision.		
541-542	De Beers shall explain the likelihood of the proposed development expanding, and any areas of medium to high development potential within the claims block.	INAC GNWT	
543-545	De Beers should provide confirmation that all existing facilities, infrastructure, etc., De Beers plans to use can adequately handle the demands generated by the proposed development. Include cumulative impacts in relation to:	All	
546	I. The bio-physical environment;	EC, INAC, DFO, NRCan and GNWT	
547	II. social environment;	GNWT	
548	III. economic environment;	GNWT	
549	IV. cultural environment;	GNWT	
550	V. heritage resources; and	GNWT	
551	VI. visual and aesthetic resources.		
553-557	Explicit documentation of the assumptions, models, information sources used as well as information limitations and associated levels of uncertainty should support all steps of the cumulative environmental assessment, in the environmental assessment report. The analysis should present data and analyses that are verifiable in nature, and quantitative where data are available. In the absence of verifiable knowledge, best professional judgment or expert opinion (unverifiable) should be used, whether that is from traditional or scientific sources.	All	
559	The approach and methodologies used to identify and assess cumulative effects should be explained.	All	
560	***2.10 Abandonment and Restoration***		

561-565	De Beers should provide a description of regulations (regulatory framework), industry standards and government agreements that are needed with respect to the closure phase of the proposed development including plans for mitigating the social and economic impacts of mine closure. Where regulatory requirements, industry standards or government agreements exist, their minimum standards, criteria, etc. should be reported.	All	
567-572	De Beers shall provide a clear (visual and textual) description of the proposed development site at closure, and after restoration. Abandonment & Restoration (A&R), components and activities should be listed. Rationale and alternatives that have been discarded should be listed, e.g., the removal of all material from site versus partial or total burial, including costs. Details of methods and location of materials disposal, both on and off-site, including the structural foundations in the bottom of the mine water clarification pond.	All	
573	***2.11 Follow-up Programs***		
574-577	Describe reporting (feedback) procedures including any proposed monitoring programs. The intent is to ensure that remedial actions are taken if the results of a monitoring program deviate from any established operational standards on environmental performance, or predictions on environmental impacts. De Beers shall describe the approach, objectives and proposed methodologies that will be used in any proposed monitoring program(s).	All	
578	***2.12 Compensation***		
579-581	De Beers should provide key elements of its policy on individual compensation and on compensation agreements, contracts or other forms	INAC	
582	***2.13 Regulatory Regime***		
583-584	Provide mapping of the claim block and include a list of authorizations, permits and licenses required to undertake the proposed development. Specify short and long-term tenure requirements.	All	
585	***2.14 Corporate Compliance***		
586-589	De Beers shall provide details on ownership of rights and interests in the development, operational arrangements and corporate and management structures should be provided. De Beers shall describe its relevant experience over the last 10 years in mining operations in Canada and in other countries with similar regulatory and social policy regimes concerning the following:	GNWT, NRCan and INAC	Mine Ministry function
590-592	: record of compliance with government policies and regulations pertaining to environmental protection and socio-economic issues, including details of any corrective measures or penalties imposed by government as a result of significant non-compliance;	GNWT, NRCan and INAC	Mine Ministry function
593	: mine safety, major accidents, spills and emergencies, including details of events and responses;	GNWT and NRCan	
594-595	: record in honouring commitments on environmental and socio-economic matters in the event of planned or premature mine closings or change of ownership;	GNWT, NRCan and INAC	Mine Ministry function
596	: operations in arctic and subarctic regions; and	GNWT, NRCan and INAC	Mine Ministry function
597-599	: De Beers shall provide a summary of all corporate policies and programs that bear on the expected environmental and socio-economic impacts of the proposed development including environmental management policies, northern hiring and business participation policies and programs, etc.	GNWT, NRCan and INAC	Mine Ministry function
600	***2.15 Presentation***		
601	***2.15.1 Conformity***		
602-604	The environmental assessment report should include a conformity table outlining to reviewers the areas in the report (including appendices and technical reports) that address the specific sections, and where appropriate line items, of the Terms of Reference.	All	

605	*2.15..2 Format*	
606-608	The format of the environmental assessment report is largely left to the discretion of De Beers although reviewers must be able to clearly identify where specific issues have been addressed and directions followed.	All
609	*2.15.3 Appendices*	
610-611	Detailed data should be contained in appendices and technical reports submitted in support of the primary environmental assessment report.	All
612	***2.15. Data Presentation***	
613-618	De Beers should present the environmental assessment report in the clearest language possible. Where technical language is used a glossary defining technical words and acronyms should be included. De Beers should provide charts, diagrams and maps wherever useful to clarify the text. Where possible, maps should be of common scale and orientation to allow for comparison and overlap of mapped features. De Beers should also provide the EAR report in electronic format (e.g., CD-ROM). Please submit PDF formatted digital files of all documents in sizes suitable for downloading from the Internet.	All

Louie Azzolini

From: Louie Azzolini

Sent: Monday, January 06, 2003 2:32 PM

To: Alan Ehrlich; Bridgette Larocque; Buddy Williams (E-mail); CARC (E-mail); Chamber of mines ED (E-mail); Chris (E-mail); Chuck. Blyth (E-mail); Colleen English (E-mail); CPAWS (E-mail); Dechi Laot'i First Nation (E-mail); Dennis Bevington (E-mail); DFO David (E-mail); DFO Marc Lange (E-mail); Doug Soloway (E-mail); Ecology North (E-mail); Eric Denholm (E-mail); Fairman Fraser (E-mail); Football Adeline (E-mail); Galbraith Empson (E-mail); Gavin_More (E-mail); General MVLWB (E-mail); Glenda Fratton (E-mail); Golder Green Leslie (E-mail); Golder Machtans Hillary (E-mail); 'Government Akaitcho (E-mail) ' (E-mail); Health Canada 2 (E-mail); J. Michael Thoms NSMA (E-mail); Jagtar_Sandhu (E-mail); Jane_McMullen (E-mail); Janet Hutchison (E-mail) (E-mail); Jennifer Keith (E-mail); Joan Freeman (E-mail); Joe Acorn; John Donihee (E-mail); John Donihee (E-mail); John McConnell (E-mail); John Ramsey (E-mail); Judy Langford (E-mail); Julie Dahl (E-mail); Kathrin Wessendorf (E-mail); Kevin Ledrew (E-mail); Letha MacLachlan letha (E-mail); LKDFN Wildlife Lands Environment Ctte (E-mail); Lutsel K'e Dene First Nation (E-mail); Lutselk'e Agatha (E-mail); Mark Dahl (E-mail); Mary Tampsell (E-mail); Matt Bender (E-mail); McNeill Jason (E-mail); Mike Fournier [Yel] (E-mail); Morison Steve (E-mail); Nick Lawson (E-mail); NSMA Bob Turner (E-mail); Nunavut Impact Review Board (E-mail); Rae-Edzo Metis Local #64 (E-mail); Robin Johnstone (E-mail); Roland Semjanovs (E-mail); Roy Ellis (E-mail); S. Kristyn (E-mail); Sierra Legal Defence Fund (E-mail 2); Stephen Harbicht (E-mail); Steve Mathews (E-mail); Steve Wilbur (E-mail); Sue I. (E-mail); Susan Hunt; Tamara Hamilton (E-mail); Tim Byers (E-mail); Tony Pearse (E-mail); Vern Christensen; Wha Ti First Nation (E-mail); William (Bill) Carpenter (E-mail); WWF - Peter J. Ewins (E-mail); WWF Tony Y. (E-mail); YK Chamber of Commerce (E-mail)

Subject: De Beers Technical Report Format

Please find attached meeting notes on *Technical Report Formats for Environmental Assessments* dated Wednesday November 21, 2001, and the suggested *Format for Technical Report submissions* to the Mackenzie Valley Environmental Impact Review Board that resulted from that meeting. Please feel free to contact me if you have any questions

Regards
Luciano Azzolini

Luciano Azzolini
Environmental Assessment Officer
Mackenzie Valley Environmental Impact Review Board
Box 938, Yellowknife, NT. X1A 2N7
Phone (867) 766-7053; Fax (867) 766-7074
mveirb.nt.ca

Draft Format for Technical Reports
Mackenzie Valley Environmental Impact Review Board

On November 21st 2001, a meeting hosted by the MVEIRB to design a format for technical reports that would enable reviewers to most clearly understand review comments. DIAND, DFO, DOE, NRCan, Parks Canada and DeBeers participated.

The following suggested format for technical reports resulted from this meeting:

Introduction

- relevant aspects of organization's mandate
- list of general subjects reviewed
- indication that comments have been submitted for all issues identified
- statement of the capacity in which comments are provided (e.g. are responses in offered as expert advisor, responsible minister, federal minister or intervenor, etc..)

Specific comments

For each specific issue reviewed, please:

1. **Identify the issue** (using Terms of Reference line and section numbers for reference)
2. State the **developer's conclusion** relating to the issue (referencing source [page or section in EA report or Information Request number] where possible)
3. State **your conclusion** relating to the issue, (including and indication of agreement of disagreement).
4. Provide a clear **rationale** (including any relevant evidence) in enough detail to support your conclusion.
5. Provide **recommendations** relating to the issue.

Preliminary Screening References

If reviewers wish to reference comments made during preliminary screening, these should be linked to specific items in the Terms of Reference.

Outstanding Information Request Issues

IR issues constraining the technical review should be identified.

Summary of Recommendations

Reviewers are requested to provide an itemized summary of recommendations.

Sample Technical Report

Introduction

The Department of Paleo-Ecology (DPE) is pleased to offer the following technical comments on the Environmental Assessment Report of the proposed Flintstone Mammoth Ranch (EA93-012). The mandate of the DPE, as described in the Extinct Species Reintroduction Act (Sec. 4(b)) charges this department with responsibility for managing the release of re-created species and related programs and policies.

We have conducted a technical review of the following general subjects in the Flintstone EA document and related information requests:

- Effects on terrestrial wildlife
- Effects on vegetation
- Effects on other re-introduced species
- Tourism related social impacts

Specific comments follow. Where no comments have been offered, no concerns were identified.

The DEP serves in this assessment as both an expert advisor and a regulator. The comments included here are offered in our departmental capacity as an expert advisor, except where it is specifically indicated otherwise.

Specific Comments

1. Changes to plant species composition as a result of mammoth browsing

Reference: ToR line # 42, EA Report Section 6.3 (p. 60)

Developer's Conclusion:
Flintstone Inc. concluded that mammoth browsing would have no effect on local plant composition. Flintstone suggests that no change is predicted because the area was historically browsed by mammoth and has been continually browsed by a variety of large mammal species since that time, and that this is a natural pressure on the vegetation.

Our Conclusion:
DPE does not agree with Flintstone's assessment of this impact. Mammoth browsing in likely to have a considerable lasting effect on local plant composition.

Our Rationale / Evidence:
Although mammoth were endemic to this area in the past, significant climate and habitat changes have occurred since (e.g. ice age glaciation and thaw). It is well established by

the paleological record that current vegetation patterns are not representative of historical ones during the period when mammoth last browsed this area.

There is also evidence that mammoth are highly selective browsers. Although mammoths were not selective browsers in their historical habitat, there are only eight species of plants expected to be palatable for mammoth in sub-arctic taiga forest that is now typical of the area.

Considering the dietary requirements of one mammoth (>300 kilos/day), the size of the proposed herd (170), and the area of the proposed project (75 km2), we conclude that browsing pressure will be heavy within the proposed project area.

Considering the dietary needs of mammoth, we predict that heavy browsing pressure focussed on so few species in a small area is extremely likely to change plant composition within that area.

The developer has indicated (EA report, sec. 2.5.4.5) that supplementary feeding is not an option.

Our calculations according to the TUSKR model indicate that browsing pressure would be reduced to Moderate-Light (FR rating 7) by either reducing herd size to 12 mammoth in the current area and doing rotational grazing or by expanding the area to 1500 km.

Recommendation:
The developer should reduce the herd size and use rotational grazing or increase the development area (range size) to prevent this impact.

2. Concerns of mammoths taking control of the theme park...

...(repeat above format for each specific comment as necessary).

Preliminary Screening References

Please note that these comments are submitted in addition to the measures suggested to the Sahtu Land and Water Board during preliminary screening, in our correspondence dated May 16th, 2012. Measures 4 and 9 (relating to ToR line 45) are still relevant and applicable. DPE would like the Review Board to consider them during this EA.

Information Request Issues

The DPE would like to note that the Flintstone Inc. has not yet responded to Information Request #9 (safety issues relating to mammoth hair collection). This is the second time

this request has been issued. We are unable to provide technical review for this issue without the requested information. (Note: This relates to ToR lines 81 to 87).

Summary of Recommendations

1. The developer should reduce the herd size and use rotational grazing or increase the development area (range size) to prevent this impact.
2. ...and so on.