MACKENZIE VALLEY ENVIRONMENTAL

IMPACT AND REVIEW BOARD

ENVIRONMENTAL IMPACT STATEMENT (EIS)

ANALYSIS SESSIONS

GAHCHO KUE DIAMOND PROJECT

Mackenzie Valley Review Board Staff:

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HELD AT:

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Day 3 of 5

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Dave Tyson	)
Doug Ramsey	)

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List of Undertakings

--- Upon commencing at 9:14 a.m.

THE FACILITATOR HUBERT: Good morning, everybody. It's Chuck Hubert with the Review Board. If we can take our seats and get started. It looks like -- good. I don't see anybody, you know, frantically removing coats anymore or anything. So, if we can get started that would be great.

My name is Chuck Hubert. Again, I am with Mackenzie Valley Review Board. I'm taking over panel manager duties from Alan, who is, you know, relinquishing the reins, reluctantly as always. But, he's -- he's doing so and that's great.

So, Alan will be with me here today. Also, Stacey, with the Review Board, as well. So, welcome. Thanks everybody for coming. It's great to -- to see everybody out.

Again, this is day 3. And the topic of air, land, and wildlife. De Beers will be presenting to us today. The point of the session here, is to discuss the breadth of the topics and -- and not go into too much depth, if we can. But, on the other hand, if -- if certain questions can be answered at this stage in the -- in the discussion and can avoid information requests, that's beneficial as well.

Just a note for people on the -- on the webcast. That, again, we are on day 3, and you should find the PDF on our website so you can keep track of -- of where we are.

Let's see. Oh, we have the option of translation, if -- if necessary, and we'll use that on a -- on an as-needed basis. Also, the -- the meeting today will be transcribed and that will be posted on our public registry in the next day or two (2). Thank you, Alan, for reminding me. The -- Chuck Hubert again, with the Review Board. And please state your name prior to speaking. That -- that will assist Wendy in her transcription.

What I'd like to do quickly, is a note on party status. We -- back in -- four (4) or five (5) years ago, there was a call out for party status when this project was in the EA phase. Things have changed since then, so I -- I'd like to give the opportunity to update those organizations and participants who would like to be status -- or, who would like to have party status.

So what I'll do is, read out the list that we have so far. And, if your -- your organization is not on this list, I'd encourage you to apply for party status. So, the list is as follows: Fisheries and Oceans Canada, Dene Nation, NWT Metis Nation, Environment Canada, North Slave Metis Alliance, Yellowknives Dene First Nation, Aboriginal Affairs and Northern Development Canada, Lutsel K'e First Nation, Akaitcho IMA Implementation Office, and the Government of Northwest Territories.

Now there are some notable organizations not on there. Tlicho Government comes to mind. And, perhaps a few government agencies as well. The -- I will send out a call officially on the public registry for parties to -- who are not on this list -- to -- to apply. And just -- just to note. The purpose of party status is to participate with information requests and during the hearing as a full participant.

With that, I'd like to -- to turn it over to De Beers, and I understand that there will be some followup comments from -- from Monday, I believe. And then, if De Beers can also introduce their new team, that would be excellent. Thanks.

MS. VERONICA CHISHOLM: Good morning. Veronica Chisholm, from De Beers. Thanks everyone for coming today.

As Chuck mentioned, it's air, land and water -- and wildlife day. So we have three (3) presentat -- or three (3) presenters today. Dennis

Chang will be presenting air. And just a -- an update in the agenda. We had noise planned for -- air and noise. The noise is not a subject of note. It is provided as an appendix to the caribou key line of inquiry in Section 7.2 of the EIS. It -- the assessment will be included as part of the wildlife presentations today. So if you have any questions on noise, that's where it is.

And so, today we will be presenting air and that will be Dennis Chang. And then it'll be followed by vegetation and wildlife, who will be -- and the presenters will be Cameron Stevens and John Virgl. So, I would invite Dennis to come on up.

(BRIEF PAUSE)

THE FACILITATOR HUBERT: Chuck Hubert, with the Review Board. Just to note before you begin, the Review Board does have some remote participants that are listening in at the moment. They are Dave Tyson and Doug Ramsey, of Tetratec. So I think you should just be aware of that. Thanks.

PRESENTATION BY DE BEERS RE AIR QUALITY:

MR. DENNIS CHANG: Can everybody hear

me okay? All right. Good morning, everybody. My name is Dennis Chang. I'm a air quality scientist from Golder Associates and I will be presenting the project's effect on air quality this morning.

My presentation contains nineteen (19) slides and it will take me approximately forty-five (45) minutes to go over my presentation, which will leave us approximately fifteen (15) minutes at the end of the presentation to an -- to answer any questions you might have.

Okay, we can start. So on slide number 2 of my presentation is the outline of my presentation. My presentation will -- contains four (4) -- four (4) parts. Part 1 is the introduction. I'll be describing some of the key term of reference requirements relevant to air quality. And then I will mention the location of air quality information in the EIS, and then just briefly discuss the overall findings of the air quality assessment.

In part 2, I'll be discussing the environmental setting at the project site and as well as in the region. I'll be discussing some of the meteorological data and air quality data that had been collected at the project site and in the -- in the region. And, also, I will outline some of the applicable ambient air quality criteria and air emission criteria that we'll consider in the assessment.

Part 3 of the presentation will be mainly focussed on -- on the assessment approach, the findings and any follow-up actions. And the last part of the presentation will just provide a overall summary of my presentation.

I'm now on slide number 3. There are four (4) key terms of reference, requirements that are relevant to air quality and they are listed as follow. The EIS must address the issue of emissions from Gahcho Kue project adding to pre-existing emissions. The EIS mu -- must provide air quality modelling for construction and operational phases, including worst-case scenarios. The EIS must further identify proven available technologies and best management practices to be used. And the last term of reference is that EIS must include an assessment of risk to human health. So when we conduct a air quality assessment, the assessment report was designed to address all these four (4) requirement.

I'm on slide number 4. I just wanted to mention where the air quality information can be found in the EIS. For baseline air quality data, these are the meteorological and air quality data that have been collected at the project site and in the region. They've been summarized in Annex B of the EIS. The actual air quality assessment can be found under subject of note, Section 11.4.

Other than these two (2) locations in the EIS, I just want to point out the air quality assessment data were provided to other disciplines for addressing effects to wildlife, vegetation, water quality, and human health.

The overall air quality findings can be summarized in one (1) sentence, and it is as follows:

"Project emissions were determined not to have signi -- significant adverse effects to air quality, although there will be temporary changes to air quality."

And another outcome of the air quality -- and I want to kind of briefly mention on this slide is the predictions in the assessment were based on conservative emission assumptions. And later on in my presentation I will go into more details about what these conservative assumptions are.

(BRIEF PAUSE)

MR. DENNIS CHANG: I'm now on slide number 6. I just want to briefly discuss the environmental setting, the air quality environmental setting at the project site and in the region.

Meteorological data has been collected at the Gahcho Kue project site between 1998 and 2005. And the overall meteorological character at the project can be characterized as mostly north -- prevailing wind from the northeast, with temperature ranges between minus 45 degree Celsius to plus 25 degrees Celsius.

Precipitation data have been collected in the spring and summer season on site in 2004 and 2005. And the data show that there's minimum precipitations occurring in the spring season and average precipitation -- daily precipitation at the project site during the summer is about 25 millimetre. And with most of the precipitation occurring in August and September. There are also ambient air qualit -- air quality monitoring station operated by various government agency in the region, and some of these include stations operated by GNWT in Yellowknife and other communities. Mostly these stations collect sulfur dioxide SO2 and nitrogen dioxide concentrations.

There is also another station operated by Environment Canada in Daring Lake, which is approximately twenty (20) -- 200 kilometres north of the project site, and that station collects particular matter concentration, so PM data. So these -- the data collected at these stations help us to kind of get a -- a better under -- understanding of the existing air quality in the region.

At the project site the air quality is primar -- is mostly influenced by forest fire and windblown dust. There is a source of manmade emissions near the project, and that is the De Beers Snap Lake mine. Overall, based on the monitoring data colleted at the en -- Yellowknife and Daring Lake, the SO2 and NO2 and PM concentrations are well below the applicable ambient air quality criteria. There have been occasionally higher readings of particulate matter concentrations, but typically there are results of forest fire in the region.

(BRIEF PAUSE)

MR. DENNIS CHANG: I'm now on slide number 7. I just want to briefly go over some of the ambient air quality criteria and air -- air emission criteria that we'll consider in this assessment.

So am -- ambient air quality criteria

are, I guess, limits for ambient concentration that was set by various government agency in the interests of protecting the public health.

And there are three (3) sets of ambient air quality criteria that were a concern in this assessment. And they are: Northwest Territories air quality standards, Canada-wide standards, and nation ambient air quality objectives. So when we conduct our assessment and we provide predictions of ground-level concentration, these are the criteria that we are trying to compare against.

Other than ambient air quality criteria, there are also emission -- air emission criteria developed by various levels of government agency to minimize the emissions coming out of various sources. And I was just going to mention four (4) emission criteria. The first one (1) is low sulphur diesel regulation. These are regulations developed by the -- the federal government which set the -- the maximum amount of sulphur in diesel.

Another set of emission criteria is the non-road diesel engine emission standards. These are also standards set by the federal government on how much emissions can be emitted from diesel non-road engines. These are the engines that will be used on various type of mining vehicles, like haul trucks, bulldozers, front-end loaders, and et cetera. So the limits are set by the federal government so that the manufacturer or the importer, the companies are importing these vehicles into Canada will have to make sure the -- these vehicles will meet these emission standards.

The next set of emission criteria I want to mention is the Canadian Council of Ministers of Environment, short for CCME, emission guidelines for industrial boilers and heaters. Again, these are standards set by the federal government on the manufacture of the boilers and heaters, that they have to meet these standards.

The last set of emission criteria I want to mention is Canada-wide standards for dioxins and furans found in waste incineration. And unlike other air emission criteria I mentioned earlier, this standard actually sets a -- is based on a concentration of dioxin and furans in the exhaust gas from the waste incinerator, rather than a actual maximum amount of dioxin and furans from the -- from the incinerators.

(BRIEF PAUSE)

MR. DENNIS CHANG: I'm now on slide number 8, and I just want to briefly describe the type of emission sources at the project, and there are basically five (5) categories of emission sources at the Gahcho Kue project.

The first -- first category is stationary point sources. These include diesel power generation stacks, waste incinerator stack, auxiliary boiler, and crusher stack.

The second category is mobile -- mobile combustion equipment. These are sources that have exhaust gas coming from various type of mining equipment, such as haul trucks, bulldozers.

The third category are mining and material handling activities. These type of emissions also typically generate fugitive dust, or particular matter emissions. So mining activities such as blasting, bulldozing, loading/unloading, crushing, will be -- will fall under this category, and the activity is -- themselves will actually cause fugitive dust.

The fourth category is exposed Kennady Lake bed, and other exposed surfaces. So unlike -- so unlike the third category, these emission sources are not related to any particular activity. They were -- they had the potential to generate some fugitive dust or PM emissions because of wind erosion. So these are -- these include exposed Kennady Lake bed after it has been -- the lake has been drained, and other exposed surfaces such as mine rock or kimberlite stockpiles.

The last category of emission sources is winter access road traffic. These are exhaust gas coming from seasonal traffic on the winter access road.

There is another source of emission other -- that is not coming from the project, and that is De Beers' Snap Lake mine, which is located approximately 80 kilometres east of the -- or actually west of the project. So when we're -- when we conduct our assessment, we -- we consider not only the emissions coming from the project itself, but also the -- the closest industrial emission sources as well.

I'm now on slide number 9. I just want to briefly go over some of the emission estimate -- estimation methods that we use in the assessment. There are generally three type of methods that we use. The first one is mass balance, so some of the emissions were estimated based on, for example, the -- the maximum fuel consumption rate or the maximum mine rock production rate or kimberlite production rate.

And the second category of -- of emission estimation method is based on engineering estimations. So a lot of time we'll have equipment specifications or -- or equipment design specs that we use in the calculation. For example, all the -- we use the maximum fuel input ratings for all the diesel generators when estimating the emission coming from that type of sources.

And another example would be -- there is a wet scrubber for controlling the fugitive dust coming out of one (1) of the crushers, and the wet scrubber is designed to be able to control a certain percent of it -- a certain percentage of dust coming out of that crusher.

And where we don't -- we don't have very good information on the -- either the mass balance information or engineering specs of the equipment, we use emission -- published emission factors developed by the United States Environmental Production Agency. And these emission factors were developed by EPA based on tests on similar type of equipment in the past. So where we're -- there's a -- a bit of a gap in the information, we try to use these emission factors in our emission estimation.

And the last bullet on this slide just kind of provides a list of all the compounds that we assess in the air quality section of the EIS. They include sulphur dioxide, SO_2; nitrogen dioxide, NO_2; carbon monoxide, CO; PM-2.5 -- these are fine particulate matter with a diameter less than 2.5; and PM-10 -- these are another category of fine particulate matter with a diameter less than 10 microns; and then the larger particulates, the TSP, total suspended particulates, and these are usually associated with part of the -- the dust that people are -- people associate with mining projects; VOC, volatile organic compounds; PAHs, polycyclic aromatic hydrocarbons; metals; dioxins; and furans.

(BRIEF PAUSE)

MR. DENNIS CHANG: I'm now on slide number 10, and I -- in the next couple of slides I just want to kind of explain some of the conservatism in the emission estimation in the EIS.

Generally, the -- the -- most of the conservatism come from two (2) sources. The first one is associated with the emissions scenario that we develop and use in assessment. And the second one is associated with the assumption that we use in estimating road dust emissions during the winter season.

And I would just go to slide 11, to kind of help me to explain the first conservatism, which is related to our emissions scenario.

One (1) of the challenges when assessing a mining project is that the emissions changes from year to year, depending on what's going on at the mine site. Some -- some years, the emission might be higher. Some years the emission might be lower. And not only that, where the emissions are released on the project site also changes throughout the life of a project.

So if we only assess the year with the largest emissions it may not necessarily lead to the -- the highest prediction off site because in that particular year most of the mining activities might be occurring in the centre of the -- of the mine footprint.

So the predictions outside the -- the footprint, where we had to meet the ambient air quality criteria, they might actually be lower when compared to other years when the overall emission might be slightly lower, but a lot of the activities are taking place around -- near the perimeter of the -- the mine site.

So really, picking a -- a specif -- a specific year to assess is one (1) of the chall -- one

(1) of the main challenges. And also we had to understand that when we're providing information to other discipline, most of the discipline need to have a boun -- a better understanding of how big of area will be impacted or be affected by the project's emissions.

So if we only look at one (1) snapshot during the course of the project life, we might not provide the -- the overall picture.

So -- now ideally, we can assess and -- and model every single year during the life of a project. But that -- that -- that is many years. And logistically, there is some challenge to that because we had to do many diff -- modelling run and will have a very large amount of data that we had to sort through.

So the -- the goal of the assessment was to develop a -- a emission scenario that's fairly conservative. That might be more conservative than what will actually be happening on the ground in real, once the project starts.

But that scenario will be conservative enough to hopefully provide the maximum predicted ground level concentration outside the project footprint, and also will provide the largest area that might be affected by the project's emissions.

So when -- so what we end up doing is we look at the emissions for every single year and based on the mine production rate, year 8 of the project, during the life of the project, will result in the highest emissions overall.

However, during that year, most of that mining activity will be taking place in the centre of the footprint. So you won't -- probably will not result in the highest off site predictions.

So we looked at the mine develop -- mine development plan in every year and we noticed that in the fir -- in the first few years of the project, most of the mining activity will be taking place in the southern end of the mine footprint. And this is mostly because the mine rock will be disposed to the south mine rock disposal area.

So once the mine rock has been extracted at the pit, they will be transferred to the south disposal area, which is located at the very southern edge of the mine footprint.

Later year -- in later years, the mine rocks will be disposed at the west mine rock disposal area, which is on the west end of the -- the mine footprint. And that's where most -- most of the emissions will be released from.

So with that information what we did end up doing was we took the maximum emission scenario and we released these emissions from two (2) different location, and one (1) based on the year 1 mine development plan and another based on year 5 of the mine development plan. That way, we'll have a be -- better understanding of how -- what the offsite effects on -- on air quality will be.

So we took these two (2) scenarios. We modelled them separately and we get two (2) sets of results. And what we end up doing to come up with the application results in the assessment is we -- every single receptor -- so I'm just going to point to the graph to the left under, "Assessment case."

So we have receptors placed across the study area and for every single receptor we'll have one (1) set of predictions based on maximum emissions release from year 1 locations and another set of results from maximum emission release from the year 5 predictions and we'll pick the highest of the two (2). So what -- so -- and which will form our assessment case predictions.

So instead of having a -- having a concentration contour that is mostly focussed to the southern end of the -- the project footprint, such as in year 1, or to the western end of the project footprint, as in year 5, the actual applica -- application case results presented in the assessment is based on a combination of both, which will give us a area that covers both of the scenarios.

Because in -- in reality, the max -- in both year 1 and year 5 the emission rates will be lower than year 8 emissions, so that's where some of the conservatism will be coming from.

MR. DAVE FOX: Dave Fox, Environment Canada. It's a -- it's a very interesting concept to the way that you're approaching this. I -- I'm just curious, was this done for all of the pollutants or was it mainly aimed at the -- more the particular matter?

MR. DENNIS CHANG: It was done for all pollutants because we -- from an air quality perspective we have ambient air quality criteria for multiple pollutants, such as SO2 and O2, CO and PM, but also for in trying to assessing human health risk, and also effects on wildlife, terrestrial environment and -- and et cetera.

It is very important for the other discipline to also get the -- the conservative predictions from the air quality assessment. So we applied this approach to all compounds that we assessed.

THE FACILITATOR HUBERT: Chuck Hubert, with the Review Board. I appreciate your eagerness to ask questions, but hopefully we can contain them till the end of the presentation and collect them and then ask them. Thanks.

MR. DAVE FOX: Dave Fox, Environment Canada. Ideally, I've got a list of questions, but some questions could be addressed much easier immediately while the slide's still on the board. So I -- I'll try to keep them to the end, but sometimes I -- I still might have to jump in.

THE FACILITATOR HUBERT: Chuck Hubert. Fair enough. You can have a few jumps. Thanks.

MR. DENNIS CHANG: So I'm -- I'm going back to slide number 10. So the second sort of conservatism in the emission estimation I mentioned earlier comes from our assumptions when estimating road dust emissions during the winter season.

We know that -- we know that road dust emissions during the summer season can be mitigated by watering of the haul roads to suppress the dust. In the winter, because of the snowfall and ice on -- on the road surface, the conventional approach is to assume negligible emissions during the winter.

Based on our understanding of the

project op -- operation will be is that the snow and ice will be constantly removed from the haul road surface and crushed mine rock will be placed on -- on the road surface to maintain traction during the winter. So, theoretically, there might still be a very low level of road dust being generated during the winter.

Now one (1) -- the difficulty trying to estimate the -- what that level of road dust emission will be during the winter is that we know it will be low, it will probably be lower than the -- our mitigated road dust emission in the summer season, but exactly how low is not very clear. And the common approach used in most of the assessments including by the government agency when developing omission inventory is to assume negligible emissions.

We feel in order to understand the potential effects of these winter road dust emissions, we should probably assign a -- a sort of number to what these emission might -- might be during the winter.

Do the difficulty is do you think -- do you assume that it's going to be zero emissions, or it's going to be just -- there's going to be so much emission it's going to be similar to what you might thought it will be during the summer when the roads are not being watered.

And there's no real good answer for that, because it's any -- anywhere in between. It could be 20 percent, it could be 30 percent, who knows. So because of that reason we took a very conservative approach.

We assumed the emissions from the road -- road dust during the winter will be just as high as the road dust that will be generated in the summer when it's unmitigated. So -- now that we know is a very conservative assumption and -- because we cannot exactly point out what the actual level of emissions will -- will be between zero and a hundred (100), we assume 100 percent emissions. And there is ongoing study which will help us to better understand that and shed some light into what the winter emissions will be.

So I just want to kind of point out the last bullet on slide number 10. The actual particulate matter concentration deposition rates predicted in the assessment are expected to be much lower than -- than what we projected in the assessment, because of mainly these two (2) sources of conservatism.

(BRIEF PAUSE)

MR. DENNIS CHANG: So I'm now on slide number 12, and I'm just going to briefly describe our modelling, dispersion modelling approach used in the assessment. The dispersion modelling was conducted using a model -- dispersion model called CALPUFF.

And this dispersion model was developed for USEPA for the purpose of determine near field and long-range pollutant transport. And this particular dispersion model have been adapted by various government agency in Canada, including the Government of the Northwest Territories.

The study area of the Air Quality Assessment is defined by area with a north/south extent of 80 kilometres and east/west extent of 160 kilometres. I just want to make a note of this information. It's not necessarily outlined in the -- on -- on slide number 12.

But this is -- so I just want to reiter --reiterate that the regional air quality stu -- study area is defined by an area with north/south extent of 80 kilometres and east/west extent of 160 kilometres. And this area is large enough to capture the cumulative air quality effects from existing -- other existing emissions forces such as Snap Lake in combination with the emission coming from the -- the project.

The local air quality study area is defined by an area of 15 kilometres by 15 kilometres centred on the project. And the local study area is -- was used to focus on the -- the effects of -- on air quality that were solely contributed by the project.

As I mentioned earlier, we assess a whole range of compounds, and these include SO2, NO2, CO, PM 2.5, PM 10, TSP, VOC, PAHs, metals, dioxins, and furans, and these are -- not only we pro -- we -- the dispersion modelling provide predicted ground level concentrations of these compounds in the atmos -- in the atmosphere, the model also provide prediction of deposition of certain compounds onto various surfaces, including ground and/or lakes.

And the compound that we have predictions -- predicted our depositions include PM 2.5, PM 10, TSP, PAHs, metals, and potential acid input. Potential acid input is a parameter that measures the potential acidification effects on the receiving environment.

So I just wanted to point out that all modelling results were used to assess the effects on human health and wildlife.

For other disciplines such as water quality, the TSP metal deposition, and the PAI results were provided for -- to be used in -- in the water quality assessment.

And for the terrestrial assessment, the -- the NO2, nitrogen dioxide concentration, and the PAI data were provided.

I have about six (6) more slides to go, and I'm just going to -- in the next few slides I'm going to be discussing the -- that -- in details the assessment find -- findings.

So now I'm on slide 13. So the predicted carbon monoxide concentrations are all well below the applicable ambient air quality criteria. Same goes for SO2, predicated SO2 concentrations.

For an NO2 concentrate -- predicated NO2 concentrations, we predict there will be some concentration that will be marginally above the applicable ambient air quality criteria immediately outside of the project development area.

And I'm just going to use the pointer to kind of explain the figure on the right-hand side of slide 13. So in this figure, there's a -- a thick black line that represent the project development area that was used in the air quality assessment.

And this -- outside of this line is where the predicted concentrations had to meet applicable ambient air quality criteria.

Another important information in this figure is the area that's highlighted by dark purple, and it's outlined by a blue line.

The -- this area is the -- where the predicted concentrations are expected -- expected to be above the air quality criteria. So you can see to the southern end of the project footprint, there's a small area where the predictions are above the ambient air quality criteria.

And this is mostly a result of all the mining activity that will be taking place in the south mine rock disposal area, so all the emissions which are essentially in these areas, and that led to a higher concentration just on the other side of the project development boundary.

(BRIEF PAUSE)

MR. DENNIS CHANG: I'm now on slide number 14. There is a figure which kind of represent the PM-2 -- the predicted PM-2.5 concentrations. Overall, there are some predicted PM-2.5 concentration that are above the ambient air quality standard. And again, in the figure you can see the black line which represents the project development area. And that's where we -- the ambient air quality standards had to be met. And the dark purple area shows where the exceedance will occur -- were likely to occur.

Now the predictions are mostly -- the higher predictions are mostly a result of the conservative emission estimation that we use in our assessment, and also, the fact that a lot of the mining activities and the activities related to transport of the material will be occ -- will be happening along the perimeter of the project development boundary. So higher predictions are expected along the -- the boundary.

And I have another slide to kind of try to explain the PM-2.5 predictions. And I'm on slide number 15. We have a figure which kind of shows how often do we expect the PM-2.5 standards, ambient air quality standards will be exceeded.

So again, we have the black line which outlines the project development area. And then we have a light yellow contour that represents where some of the exceedance were likely to occurred. And as you can see, the -- the frequency of the exceedance decreased dramatically as -- as one moved away from the project boundary.

And in the low -- lowest con -- contour level shown in the figure -- which is supposed to be light yellow but I think on the project -- projector the colour is a little bit different -- these are area where the predicted -- prediction indicate that there might be exceedance anywhere between one (1) to fourteen (14) days a year.

And most of the higher frequency of exceedance will likely be limited to -- to -- to the area along the perimeter of the project development boundary and also on the other side of the boundary where most of the emissions will be released from.

So in general, no concentrations abo -- there will be no concentration above the Northwest Territory air quality standards predicted beyond 3 kilometres from the project development area -- area boundary, and this is based on a very conservative emission estimate.

I'm now moving on to slide number 16, and I'm going to try to explain the predicted TSP concentrations. Again, similar -- similar to the PM-2.5 predictions, because of the conser -- conservative emissions used, we see some predicted concentration of TSP above the ambient air quality standard. This is represent by the dark purple area in the figure on slide number 16.

And in turn, on slide 17, I have a similar figure which shows the frequency of exceedance. Again, the frequency of exceedance will decrease dramatically as you move further away from the project. And based on the modelling, concentra -- there will be no concentration above Northwest Territory air quality standards predicted beyond 2 kilometres from the project development area.

And the area represented by light yellow in the figure are -- is area where we expect anywhere between one (1) to fifty-nine (59) days of exceedance in a year based on a very conservative emission estimation.

(BRIEF PAUSE)

MR. DENNIS CHANG: So I have two (2) more slides to go. I'm on slide number 18. There are some followup actions that De Beers is currently -- that will be -- De Beers will be undertaking after the air quality assessments. Currently there -- we -- De Beers is continuing ongoing work to better understand the level of fugitive PM emissions to validate assessment results and to reduce the uncertainty in the assessment.

As I noted earlier, there -- there are a lot of conservatism that was used in the assessment and which might contribute to a very conservative result, and there's ongoing work to try to better understand some of these assumptions and to validate them and also to refine them.

In most likely scenario, after this work have been done, the -- the estimated emissions from the project will probably be lower and resulting in lower -- a lower prediction than those presented in the assessment.

Another follow-up action items is De Beers will develop a air quality management plan to -- for the project. Another action item is De Beers will design and implement a monitoring program to validate the predictions in the assessment.

So we have seen -- gove over some of the predictions that -- from the assessment, but will there -- will there actually be that level of predictions once the project starts? And this will be par -- partially validated with a monitoring program.

And the last item is De Beers will be committed to the proven management practices to minimize emissions and protect -- be protective of the environment.

I'm on the very last slide, slide 19. So I just want to summarize alo -- the information that I have presented over the last forty (40) minutes. The key finding of the air quality -- quality assessment is the project emissions were determined not to have significant adverse effects to air quality, although there will be temporary changes to air quality. And these can be highlighted by the fact that predicted SO2 and CO concentration are less than the Northwest Territory air quality standards.

The predicted NO2 concentrations are near the guideline levels imme -- immediately outside the project development area. For predicted PM-2.5 and TSP concentrations the -- the predictions will be -- are above nor -- Northwest air quality standards immediately outside the project development area.

And I would just like to highlight some of the key points I -- I mentioned in my presentation. The -- the predictions are based on very co -- conservative assumptions. These include conservatism coming from pollution based on worst case emissions released from worst locations assuming no natural mitigation on road dust in the winter when there is probably some level of natural mitigation. And the fact that there is ongoing -- currently ongoing work to review the emission estimation and the level of natural mitigation.

And to conclude the -- the presentation I just want to mention the fact that an air quality and emissions management plan will be developed for this project. And that's the end of my presentation.

QUESTION PERIOD:

THE FACILITATOR HUBERT: Chuck Hubert with the Review Board. Thanks very much for that presentation and you're right on the time that you said you would be. And thanks for holding off on -- on the questions. I know it's difficult, but I think it helps with continuity and flow of the presentation.

So questions, and you have the floor.

MR. DAVE FOX: Hi, Dave Fox, Environment Canada. Thank you for your presentation, it was very informative. It -- it does look like Golder has put a lot of thinking into this project and I -- and I appreciate that.

And I -- I really like your frequency plots. I find those very useful, so -- so thanks. It's nice to see those in -- incorporated in there. And I'll try to string these questions together and make some sort of sense, starting with the -- the emissions side of things.

You mentioned that Snap Lake is included. You know what, I'm going to -- I'm going to put a caveat on my questions, as well. I've -- I've given the -- the EIS a quick ready, but not a detailed read, so I apologize if some of this information is in there somewhere. It won't -- I won't be offended if you tell me that, so.

So you mentioned that Snap Lake is included. Is -- is that included as a discreet emission source, and if so, what kind of emission source?

MR. DENNIS CHANG: Dennis Chang from Golder Associates. To answer Dave's questions, the emissions from the De Beers Snap Lake mine were modelled as discreet emission sources, and this include all of the emissions that have been presented in the Snap Lake EIA and other follow-up amendments.

So any changes in Snap Lake's emissions over the course of the year -- over the course of year -- years were reflected in the assessment.

MR. DAVE FOX: Dave Fox, Environment Canada. Were all those emissions aggregated into like a single point source, because it is quite a ways away, or were the individual emission sources left? Like you've got your area sources for the -- the pits, you've got your point sources for the -- the generation and various things.

MR. DENNIS CHANG: They were modelled as individual sources, just as they were modelled in the -- all the previous air quality assessments for the De Beers Snap Lake mine. So they were not grouped together into one (1) single sources -- one (1) single source.

MR. DENNIS FOX: Thanks for that. Dave Fox, Environment Canada. You also mentioned truck emissions and -- and various regulations on -- on emission standards for the trucks.

Now currently the -- the regulations are for Tier II trucks, but those -- those regs are being amended to -- up to -- to Tier IV. Tier IV isn't currently available yet. So I'm wondering in your -- your emission estimates, what did you assume for -- for a tier -- or emission standard for the trucks?

MR. DENNIS CHANG: This is Dennis Chang from Golder. To answer Dave's question, in the assessment we used Tier II emission standards. I believe, and, Dave, you can probably shed some light into this, the Tier IV emission standard regulation will be adopted next year and there will be a -- a -- a period which allows our manufacturer, or the importer of the -- the mining vehicles to -- able to design and develop engines that will meet the -- eventually meet the Tier IV emission standards.

MR. DAVE FOX: Dave Fox, Environment Canada. Yeah, I believe the -- the amended regs are supposed to come into effect around the 2015 stage, but we're not sure when they're actually going to be implemented. And just as an example, the -- the current standards or regs came in in 2006, but I believe the Tier II trucks just became available in 2010. So we expect a bit of a lag time. So I -- I'm happy that you -- you chose the conservative route and -- and gone with the -- the Tier II trucks, which is probably more realistic for your time scale.

All right. I was curious, as well, for the -- the exposed lake bed, and just how you -- you estimated the dust from that. If you -- if you did anything special because it is -- well, I -- I've never seen any emission estimates from lake beds before, but that -- that could be a fairly significant source. So I'm just wondering if there's any different approaches that you guys used for that.

MR. DENNIS CHANG: This is Dennis Chang

from Golder Associate answering Dave's question.

To address the potential air quality effects from dust coming off the exposed Kennady Lake bed, that is one (1) of the key term of reference requirements. Based on some information on other existing diamond mines in the region, there should be -- there shouldn't be a significant amount of dust coming off the exposed lake bed because typically there is a level of moisture that remains on -- on the -- on the lake surface even after the lake has been drained.

And typically -- while based -- based on some of the information we gather, it -- it seems they -- the moisture will form a, I guess, a hard surface on the lake surface, which should minimize any potential windblown dust coming off the exposed lake bed.

Now, in the EIS, the approach that we took is, even with that information, we took a -- we used a fairly conservative approach. We assume the lake bed will act just like any other exposed surface, such as a stockpile for mine rock and kimberlite, and -- and will actually have some windblown dust coming out the exposed lake bed.

Now, the -- the one (1) thing we did include in our assessment is during the winter when the lake bed is expected to be covered by snow and ice, there will be no emission coming out of the lake bed. And that's reasonable because those surfaces will not be disturbed once they -- the -- the lake has been drained.

(BRIEF PAUSE)

MR. DAVE FOX: For -- for the -- Dave Fox, Environment Canada. For the fine particulates that -- that the PM-2.5, I'm just curious if there was any analysis done between the -- the differences in emissions of PM-2.5 from -- from combustion sources as opposed to the fugitive sources.

And I'm asking that just because the -- I realize that fugitive sources are inherently uncertain, and a bit of a dog's breakfast no matter how much effort you put into that, but the combustion side is much better defined. So I'm just curious if there was analysis, or if you can even give me an indication of the ballpark ratios between -- is there -- is there a lot more from the fugitive, or a lot more from the combustion?

MR. DENNIS CHANG: This is Dennis Chang answering Dave's question. Dave, you are correct about the uncertainty in terms of estimating fugitive PM-2.5

emissions. And I don't have the numbers in front of me at this moment, but based on my recollection the PM-2.5 emission based on our estimation of the road dust, which is -- contains very high level conservatism, I believe it represent close to half of the PM-2.5 emissions from the project. But I can verify that -- that number for you maybe after the break, or later after lunch.

Should -- typically PM-2.5 emissions come from mostly combustion sources. And the PM-2.5 emissions coming from fugitive sources in terms of the -- the methodologies that -- that have been developed over the years by various regulators in the US and in Canada. They have -- they -- they have been highly suspect -- suspected.

And there's currently not a lot of good understanding what that emission might be. But typically, they -- the fugitive dust or fugitive PM emissions are related to larger particulate matters. Because typically, finer -- fine particulate matter are formed during the combustion process.

MR. DAVE FOX: Dave Fox, Environment Canada. And I'm curious about the project development area and how that was defined. Is -- can you -- can you explain? I -- I know in the south, facilities use fence line type of -- of delineation. But that's not really practical up here. So -- and it doesn't really look like a -- a very rectangular area that you guys chose.

So I'm just curious how -- how you chose that?

MR. DENNIS CHANG: This is Dennis Chang from Golder. I can probably go back to one (1) of the slides which shows the project development area that was used.

Yeah. I'm on slide 15. So the thick black lines shows the project development area that was used in the -- in the assessment. The purpose of that line is for comparison of the pred -- ground level predictions to applicable ambient air quality standards. There will actually not -- there will not be actually, any physical fence line around the perimeter of the -- the project.

The -- because the project footprint has been minimized to -- has been minimized, what we -- what the actual development area boundary that we picked is -- very closely followed the -- the actual mine footprint. With the exception to the west end, where these lakes are considered a disturbed area. And -- however, to make our assessment simpler and easier to understand, we did not extend the project development boundary along these lakes to the west of the -- the projects.

MR. DAVE FOX: Dave Fox, Environment Canada. I'm curious also about the -- the particulate and pH modelling, and on a -- on a couple of aspects. One (1), just how it's conducted. I -- I suspect that you're using the TSP deposition predictions and then applying some speciation factor to that. Curious about the -- the different sources of the emissions of -- of pHs and metals, and whether there are consistent speciation profiles for those sources and how those -- those source profiles are -- or what they're based on.

MR. DENNIS CHANG: This is Dennis Chang answering Dave's question. Especially for deposition of compounds such as particulate matters, PAH, and metals, the assumption was that PAH and metals are part of particulate matter. And when the particulate matter deposit on -- onto a surface, part of the particulate matter will include PAH and metals.

To answer your question regarding to the speciation of PAH and metals for various type of emissions sources, I can defer you to, I believe, Appendix B of -- of the SON section you have on point 4. We have a technical appendix which describe all the speciations that were used for each type of source.

For example, I'll give you an example, for exam -- metals in particulate matter coming out of mining activity related to trans -- transportation of mine rock. So we'll -- we use the -- the metal analysis for the mine rock in our speciation, and the same thing when we assess the metals coming from any activity that related to transportation of kimberlite. We use the metal analysis for kimberlite.

THE FACILITATOR HUBERT: Chuck Hubert, the Review Board. Can we limit further questionings to one (1) question, please. Okay.

MR. DAVE FOX: Dave Fox, Environment Canada. I have one (1) last broad, multi-part question. It's -- it's to do with management plans. Now, you mentioned that there will be an air quality management plan drawn up. My first question is when do we expect to get some details on that or when will it be completed?

The second part of that -- that single question is you mentioned incineration early on and dioxins and furans. Are you also planning on -- on completing that incineration management plan for the project as well and just when we should expect to see details and -- and that plan completed?

Finally, just curious, in -- actually, I lied. I have one (1) other sub-question after this. But the monitoring plan, if -- when -- if and when you will be able to provide some details on the type of monitoring that you're planning on doing.

And the other sub-bullet, sorry for a very long question, I was curious about the -- the PAI results and why you're getting such high numbers and if there's a reason for that. Those results surprised me a bit.

(BRIEF PAUSE)

MR. DENNIS CHANG: Dave, this is Dennis Chang, from Golder. Just before I answer your questions I just want to correct my response for your previous question about the emission speciation for various type of emission sources. There -- we have a appendix which describe all the emission speciation that we use in the assessment, and you can find that in Appendix 11.4.2. So it's part of the SON Section 11.4.

And I will let Veronica answer your question regarding to the management plans.

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers Canada. Yes, we're in the process of developing the management plans, but obviously there'll be some consultation with Environment Canada over the next few months in order to ensure that we have the correct details in there. And, also, with respect to the monitoring program, it would follow a similar process in terms of consultation. Thank you.

(BRIEF PAUSE)

MR. DENNIS CHANG: This is Dennis Chang. In re -- regards to thePAI predictions, we -- obviously we use a fairly conservative assumption when estimating the -- the combustion emissions. PAI are mainly contributed by SOx and NOx, And there's very li -- there's a very low level of SO -- SOx emissions from the project, so mainly thePAI is being -- is coming from the NOx emissions. And we use the -- in our emission estimation we use the Tier II emission standards for the mine fleet and there might be some conserve -- conservatism in the NOx emission coming from the diesel power gen -- generators.

We used the assumption that there will be -- all generators will be operating all year round, when, in fact, at least one (1) of them probably will be offline for maintenance and -- and such during the year. So there is some conservatism in -- in that and we can further address that if you have any question.

THE FACILITATOR HUBERT: Chuck Hubert, Review Board. Thanks very much for the presentation, the questions, and answers. It's 10:30 now. I think we should take a health break for -- oh, sorry, and aft -- after ten (10) minutes we'll return with the soils and vegetation topic.

Thanks. See you then.

--- Upon recessing at 10:30 a.m.

--- Upon resuming at 10:48 a.m.

THE FACILITATOR HUBERT: Good morning, ladies and gentlemen. If we can get started again. And just a reminder to people coming into the room at the moment, and I notice they're signing in dutifully, and we encourage that. Please do sign in, as it makes it easier for us to have a good record of -- of who attended. Thanks very much.

So I'd like to restart again with some brief follow-up on air quality, and I believe Dennis will have some follow-up to a question from Dave -- from Dave Fox earlier, and then we'll go to Madelaine for a question.

So go ahead, Dennis.

(BRIEF PAUSE)

MR. DENNIS CHANG: Okay. This is Dennis Chang from Golder. Dave Fox from Environment Canada has had an earlier question regarding to what percentage of the projects total PM-2.5 emissions are from combustion sources versus fugitive sources.

I have that information for him. We estimate that 32 percent of tot -- project's total PM-2.5 emissions will be coming from const -- combustion sources and 67 percent of the project's total PM-2.5 emissions will be coming from fugitive emission sources. And this is a ratio that we don't typically expect, because PM-2.5 are typically byproducts of combustion emissions and this -- this ratio basically just highlight the conservatism that we use in estimating the fugitive PM-2.5 emissions.

THE FACILITATOR HUBERT: Chuck Hubert, Review Board. Thanks very much for following up with that so quickly. So, Madelaine, follow up with air quality, please.

MS. MADELAINE PASQUAYAK: Thank you.

This is Madelaine Pasquayak. I just have a question regarding the -- the amount of pollutants, you know, that this project can anticipate over its -- over the years of its operations.

I was just wondering, given the amount of poll -- pollutants that would be -- that -- that will follow from -- from this project on land and water, I was just wondering what kind of impact would this have on the vegetation in the water, and what it would mean for the fish and for the wildlife that feed on this -- on the vegetation? Thank you.

MS. VERONICA CHISHOLM: Veronica Chisholm from De Beers Canada. Thank you, Madelaine, for that question.

The impacts to vegetation, water, wildlife, will be answered in presentations that we're going to have today and tomorrow, so those would be the effects portion of it. So we'll just follow up with those presentations. Thank you.

(BRIEF PAUSE)

THE FACILITATOR HUBERT: Thanks very much. Steve Ellis in the room, I believe. Oh, there you are, go ahead. Sorry.

MR. STEVE ELLIS: Yeah, Steve Ellis with the Treaty 8 Tribal Corporation. So this is a bit of an odd situation. While I wasn't in the room listening, there was someone on the phone listening who emailed me a question, so I'm completely unaware of the context of the question I'm asking, but he's written it out for me, so.

This is from the Yellowknives Dene:

> "So there was a discussion about long-term, persistent organic pollutants, both in terms of guidelines and predictions. However, the modelling is based on best practices being implemented, and as we've seen at all the other mines, emissions exceedances should be expected rather than a remote possibility. The presentation doesn't discuss POPs. What kind of deposition and concentrations did the modelling predict for these persistent chemicals?
>
> 2. Has the Company collected baseline for furans and dioxins in the surrounding environment in the local

study -- study area for parties to be able to evaluate effects, and generation of persistent pollutants of the mine during operations and post closure.

And third, does the Company's emissions air quality management plan include a resampling process for POPs, especially if exceedances are noted."

I will definitely not have a follow-up to these because I have no idea what he's talking about. Hopefully someone over there does.

THE FACILITATOR HUBERT: Thanks very much. And in your response, can you outline the acronym, POPs, for us, please.

MR. DENNIS CHANG: This is Dennis Chang from Golder Associates. When you say POPs, do you mean pH, or --

MR. STEVE ELLIS: Persistent organic pollutants.

MR. DENNIS CHANG: Okay. Regarding to deposition of these pollutants in -- in the receiving environment, and their -- what their effects will be on -- on vegetation, wildlife, and -- and so on, these will be covered by a preceding (sic) presentation for terrestrial, and water quality, and wildlife, in the next two (2) days.

The presentation on air quality given this morning is mainly to discuss effects on air quality rather than the -- the other receiving environments.

MR. STEVE ELLIS: Steve Ellis here. I guess I do have a follow-up.

There was a question about if the Company's collected baseline for furans and dioxins.

MR. DENNIS CHANG: I'm not aware of any baseline monitoring of di -- dioxins and furans at the project site.

MR. STEVE ELLIS: I guess the point being made by the question asker here is that if baseline has not been collected for those elements, or items, chemicals, how does De Beers intend to monitor for change with regard to those furans and dioxins, which we -- from -- if I understand, the GNWT's concern is that stuff will be emitted through the -- the incinerator stacks.

MS. VERONICA CHISHOLM: Veronica Chisholm from De Beers. I -- I guess I'd like to remind you, and it's included in the emissions inventory, that furans and dioxins are accounted for as part of the specifications for the incinerator.

So that information, we have a -- we use that information to develop a baseline emissions case, and De Beers will be developing a management plan and a monitoring program to determine how best to follow up on monitoring of the sites. Thank you.

(BRIEF PAUSE)

MR. ALAN EHRLICH: It's Alan Ehrlich. I have a -- a question that you -- you might be able to shed light on fairly easily. It's regarding carbon emissions and the relative contribution of this project to the carbon emissions of the existing diamond mines in the cumulative context.

So, of the reported emissions in the NWT, I know many cumulative sources of -- of carbon emissions are not reported in the NWT because they are small point sources. But they -- you know, I mean house heating and cars, that stuff's not reported. But larger industrial emissions, the larger sources are. And 80 percent -- as I recall, 80 percent of the -- the total for the NWT is coming from diamond mines and -- and related industry.

I was wondering what kind of a contribution the proposed project is expected to make to that in terms of proportion? Thank you.

MR. DENNIS CHANG: This is Dennis Chang from Golder. To answer your questions, Environment Canada has issued annual reports on greenhouse gas, including a comprehensive greenhouse gas emission inventory for Northwest Territories. So that's a -- a good reference to use to understand the level of greenhouse gas emissions in the Northwest Territories.

The -- as for the project's greenhouse gas emissions and how much these contribution will be in -- in the curr -- current territorial greenhouse gas emission inventory, the green -- the project's greenhouse gas contributions is summarized in Appendix 11.4.2 of the -- under the SON Section 11.4. And so, I don't have the actual greenhouse gas emission in front of me, but I would encourage Alan to take a look if -- and hopefully you can get the information from -- from that appendix.

MR. ALAN EHRLICH: Thanks. I asked partly for the benefit of the parties. It would be helpful if De Beers can have a look at it and try to answer that question, perhaps sometime later today.

MS. VERONICA CHISHOLM: Veronica

Chisholm, from De Beers Canada. Yes, we'll try and provide that answer in the afternoon. Thank you.

MR. ALAN EHRLICH: Thank you.

THE FACILITATOR HUBERT: Chuck Hubert with the Review Board. Thanks very much. With that we'll close the topic of air quality and move on to soils and vegetation. So, De Beers, please once again state your name and occasional reference to slide numbers as you're going through your presentation. And we look forward to what you have to say. Thanks.

PRESENTATION BY DE BEERS RE SOIL AND VEGETATION:

MR. CAMERON STEVENS: Okay. Thank you. Thanks for being here. My name's Cam Stevens. I'm a biologist with Golder Associates in the Edmonton office. And I've been working on this project, on and off, since I started working at Golder. About five (5) years.

And we are -- John and I are really excited to share some of this work. It's -- it's -- for us, it really challenged us and -- and before we begin, we want to thank ENR and their staff for some early feedback on this EIS. Their comments have certainly challenged us and -- and we believe that our conclusions are stronger because of the follow-up work that has addressed some of these comments. Now, the dialogue of course, between Golder, De Beers, and ENR is ongoing.

On slide number 2. These are some of the sections that are relevant to the terrestrial environment. There are actually more sections, they just didn't fit on to the slide. But the ones that we're going to focus on today, are Section 7, the key line of inquiry, caribou. Section 11.7, subject of note, vegetation. Subject of note, carnivore mortality, 11.10. Other ungulates, 11.11. And 11.12, species at risk in birds. There's another se -- section I want to draw your attention to, and that's Section 5, and, specifically, 5.4, which provides a summary of -- of TK and related baseline summaries.

I'm just going to begin here with the concluding statement for the terrestrial environment, and that is that the impacts from project will not have a significant negative influence on the persistence of terrestrial valued components. These include the vegetation community, caribou, musk ox, moose, wolverine, grizzly bear, and species at risk. This conclusion was based on a weight of ev -- on the weight of evidence from the analysis of primary pathways. And John went over this a little bit on Monday.

The EIS embraced multiple assessment approaches and endpoints per species, and this was done to not only meet the terms of reference but was critical in reducing uncertainty in the predictions. The EIS also con -- considered a variety -- a suite of ecological conservatism throughout the assessment, and the idea was to -- to do this so that impacts would not be worse than predicted.

This statement was also based on a number of mitigation and -- and measures being used to protect the environment. And in Appendix 7.1 there is a complete list of some of the -- of some of the mitigation and measures that De Beers is committed to.

And, in summary, some of them include promoting natural re-vegetation and practising progressive reclamation as the mine develops. The application of water to roads to limit fugitive dust, enforcing speed limits, suspending blasting if caribou are within a da -- danger zone, using low po -- profile roads to facilitate movements of caribou, and the incineration of food waste on a frequent and regular basis to reduce holding time and any odours that might -- may occur on the site.

5.5. So I'm kind of go -- going to break. Just an FI -- FYI here, that the structure of today's presentation on the terrestrial environment is going to be a little bit different than what's in the agenda. I'm going to spend about twenty (20) minutes going over some key concepts in the assessment approach. And I'm going to go over some methods that apply to the subject of no vegetation, caribou, carnivore mortality, and other ungulates, so there's some re-occurring themes across all sections.

I'll spend about fifteen (15), twenty (20) minutes on vegetation, forty-five (45) minutes on caribou. The ma -- the reason why we're spending the majority of our time on caribou is that the terms of reference for caribou were quite extensive. And about fifteen (15) minutes for carnivore mor -- mortality, and twenty (20) to thirty (30) minutes for other ungulates and species at risk.

So again, a subject note, SON here, the SON is subject note. KLOI is key line of inquiry. Slide 6. The project is located at Kennady Lake about 140 kilometres northeast of Lutsel K'ue and 280 kilometres northeast of Yellowknife, 84 kilometres east of Snap Lake.

The project is in this transition eco zone ar -- surrounded by rolling tundra, boreal forest to the south, and a mosaic of large and small lakes across the landscape. There are nu -- there are a number of lar -- large long eskers north of the project running in an east-west direction. To the north we have a characteris -- your -- the -- the rolling tundra. To the south we have the boreal forest and patches of spruce forest that you see here in this photograph.

Baseline surveys have recorded caribou, moose, musk ox, grizzly bear, wolf, upland birds, water -- waterfowl and a number of raptors over the years. John went over this on Monday. Our value components are vegetation communities, caribou, wolverine, grizzly bear, and wolf, moose, muskox, and species at risk.

A value component can be a species. It can also be a broader taxonomic group, like a ecosystem community.

Slide 7, going to slide 8. This --

MR. JOHN VIRGL: This is John Virgl from Golder Associates. Sorry, Cam, I didn't mean to interrupt you. I'd just like to make some clarification for a question that was raised on Monday during my presentation on the assessment approach.

And it asked a couple of questions about how cumulative effects were addressed in the EIS. And it fits in with what Cam is going to talk about here because it is basically the pathways and -- and the measurement endpoints and the assessment endpoints.

And after some discussion with Alan Ehrlich, and reading the transcript on Monday, I have a better understanding now of what I was being asked, so I want to provide a little bit of clarification here.

I think some of the potential confusion arises from the way in which we screened certain effects determined to be under the category of secondary pathways, and whether we carried those forward in the cumulative effects assessment. Many of these secondary pathways represent smaller, or more detailed, scale interactions that occur within the context of primary pathways.

So with respect to the question by Julian Kanigan regarding whether we looked at the way in which the combination of changes to the environment from secondary pathways could result in cumulative project specific effects to assessment endpoints, the short answer is, yes. For example, in the vegetation subject note, six (6) secondary pathways were determined to result in minor changes to the environment and negligible residual effects on vegetation.

And these included physical changes to

soil and permafrost, physical changes from the winter access road footprint, physical damage to plants from being covered with dust, changes in soil quality from dust deposition and air emissions, dewatering of Kennady Lake can result in vegetation establishing on the lake bed, and introduction of invasive species.

The changes from all these secondary pathways occur within the physical project footprint. The exception is changes from dust deposition and air emissions, which are predicted to extend up to 500 metres to 1,000 metres from the project. The combination of five (5) of these six (6) pathways is not producing additional effects outside the actual physical disturbance of the -- from the project footprint. The small additional change of about 169 hectares from dust and air emissions is predicted to have a negligible effect on vegetation.

The key point here is that direct loss and fragmentation of vegetation ecosystems and plants from the project is a primary pathway. And the effects from this pathway are further analyzed and classified to determine significance.

The combination of the project-specific cumulative effects from the secondary pathways on vegetation ecosystems and plant populations is captured in a more detailed analysis of the assessment of the primary pathway. It's also important to understand that the assessment of effects to vegetation is completed from construction through closure, and post closure.

Now, with respect to question from the Board's cumulative effects consultant, Mr. Antoniuk, and the reference to the CEA agency practitioner's guide, and the question of whether effects predicted not to be significant are carried forward in the cumulative effects assessment, falls along the same lines of the reasons I just gave.

As I just mentioned, the key point is that although local-scale secondary pathways were determined to have negligible to insignificant effects, they are carried forward in the cumulative effects assessment because they're inherently considered in the analysis of primary pathways.

In the EIS, the objective was to be transparent and to demonstrate the smaller-scale relationships underlying effects assessed in the primary pathways. The assessment of secondary pathways was also done to evaluate the potential for smaller-scale effects to extend beyond the physical footprint of the project, and to make sure that we evaluated all potential impacts so that we could make reliable predictions about what was likely to occur from the project, include -- including the potential for cumulative effects. Thank you.

THE FACILITATOR HUBERT: Chuck Hubert with the Review Board. Thank you very much for clearing that up. That's useful.

Please continue.

MR. CAMERON STEVENS: So what John is saying is essentially secondary pathways feed into the primary pathway assessment, and John presented this slide actually on Monday.

At the end of the day, we want to know what the effect is to the persistence of the caribou herd, the population of -- of grizzly bears, and to get at that -- that concept, get at that -- that question, we look at measurements or changes in habitat types, the area of habitat types, is there habitat loss. We look at changes in habitat quality, and changes to reproduction and survival.

Assessment of these measurement end points together provide the information needed to -- to answer the question whether or not the -- the project is affecting the persistence of the caribou population for a value component.

This -- and this -- this analysis takes

into consideration not only the project, but the existing environment, the natural environment, and the previous and existing number of developments that are on the landscape.

Again the secondary pathways that John was talk -- was referring to are captured in the assessment of the primary pathways.

Slide 9. We had multiple study areas for the assessment -- for the assessment; a local study area and regional study area is common practice for oth -- in the region for other mines in the region. And the study areas are similar in size to that being used at other mines in the region.

The local study area, the LSA, was approximately 200 kilometres squared, and that is this orange square or rectangle on the finger -- on the -- on the figure, and the LSA is used to measure direct effects, and immediate indirect effects from the project, such as these -- some of these secondary pathways.

The local study area is the effects study area for vegetation and soils. It's where we -- we conduct and coordinate quite a bit of field work. It also includes the winter access road, which is a 120 kilometre winter access road extending from the project going northwest to MacKay Lake.

The regional study area, identified by this purple square, is 5,700 kilometres squared, and for reference each of these grids on this figure is about 20 by 20 kilometres.

The intention of the RSA is to capture the maximum spacial extent of direct and indirect effects from the project where indirect effect -- indirect effects may include noise, lights, sensory disturbances, for example.

The RSA is also used as the effects study area for wildlife value components such as moose, muskox, water fowl, raptors, and species at risk.

For assessing cumulative effects for species that have large home ranges, that have population units that extend beyond the regional study area, we used a larger cumulative effects study area. And for wolverine and grizzly bear, we used the Slave geological province. In this figure, that Slave geological province is identified by the black polygon.

The SGP, the Slave geological province, was 200 kilometres squared, and we chose this study area because it best met the terms of reference.

MR. ALAN EHRLICH: I'd just ask for a correction. I think you just said two hundred (200) but I see a different number up there.

MR. CAMERON STEVENS: Two hundred (200) kil -- 200,000 kilometres squared.

MR. ALAN EHRLICH: Thank you.

MR. CAMERON STEVENS: Thank you. So this SGP area has been the focus of quite a bit of research on the animals, on grizzly bear and wolverine within this region. So this is a good reason why we should be using the study area.

Another reason is that this landscape has a high number of devel -- has a number of developments in this region. If you were to move the landscape to the right or to the left, you'd have fewer developments in your study area.

So it's an environmentally conservative approach to use the Slave geological province. The main point is that the Slave geological province, which encompasses an area of 200 -- 200,000 kilometres squared, best method terms of reference for the EIS. And so we are confident that this area provides ecologically relevant impact predictions for both wolverine and grizzly bear.

For your reference, the purple box here is a regional study area just to give you the scale of the -- or the size of the SGP compared to the RSA.

Slide 11. Processing cumulative effects to the persistence of caribou populations, there are multiple study areas delineated and determined using seasonal home ranges of the Bathurst and the Ahiak caribou herds.

We had seasonal home ranges for the summer, the northern -- northern migration, the rut and the winter range. And the figure to the right illustrates a number of different colour polygons. And each of these different colour polygons represents a seasonal home range.

And these seasonal home ranges were determined or based on thousands of collar locations collected over dozens of animals over a decade of study by ENR.

And what some of this ge -- analyses that generated this figure told us, was that the project is most likely to inter -- intersect or interact with the Gahcho Kue -- or the herd that's most likely to interact with the Gahcho Kue project is the Bathurst herd.

And also, there are many more developments in the Bathurst herd than there are in the Ahiak or Beverley herd. So with that said, most of the EIS and its presentation in this workshop emphasizes effects to the Bathurst herd.

(BRIEF PAUSE)

MR. CAMERON STEVENS: So a big undertaking for this project was to first establish a database of previous, existing and foreseeable developments across the cumulative effect study areas. No one had done this before. This was a novel undertaking.

This is slide number 12. Thank you. There were numerous data sources for this exercise, INAC, the Resource Board, Natural Resource Canada. The majority of the developments that were identified were based on information, spatial and temporal information associated with land use permits.

We categorized about sixteen (16) different types of developments, ranging from mineral exploration sites, communities, fuel storage areas, lodges, outfitters, power plants, quarry pits, staging areas, transmission lines, all season roads, highways, winter access roads.

And part of this exercise was to determine what the footprint area for each of these developments were contributing to the landscape. And we assigned footprint areas to some developments that we think overestimated the actual footprint. We -- we didn't know what the actual footprint was, but we -- we erred on the side of caution and -- and assigned larger values than -- than what may actually exist for some of these developments.

For example, mineral exploration sites were assigned a footprint area of a 500 metre radius, which is approximately 79 hectares.

So the footprint sizes vary, depending on the type of development. For communities and for mines, we actually used remote sensing information and digitized the actual footprint in a GIS.

And one (1) other thing. We classified these developments as active or inactive. So a development that was active was -- was one (1) -- was one (1) where its permit was -- was active. It's a five (5) year permit. So during that time it was active, after which is was deemed inactive. It was still a permanent feature on the landscape but it was no longer active. And this is relevant for a zone of influence topic that I'll go over in a few slides.

One (1) of the interesting things we found from this exercise was that mineral exploration sites are by far the most -- numerically by far the most abundant feature on the landscape. Also, the footprint cover, if you add up all areas of all these footprints it's an incredibly small number. It's less than 1 percent of the annual home range for Bathurst caribou.

Slide 13. The next few slide -- the next few slides will briefly touch on the topic of habitat change and how it was assessed in the EIS. Change in habitat area for habitat types and for -- and for preferred habitat is a key measurement endpoint across all wildlife valued components.

Habitat was described using raster maps in GIS. So if you can imagine a paper map but on your computer comprised of thousands of little, tiny cells and each cell represents some type of information. And we did this to -- ri -- we assigned -- well, we described these cells two (2) ways.

First, we -- we described each cell on this large habitat map as either esker, forest, or heath tundra. And then we describe these cells according to their habitat suitability or the quality for a specific species, and we did this using models, habitat models, resource selection functions, where a small value approaching zero is not preferred habit, it's a poor quality habitat, and a value approaching 1 is -- is a preferred habitat or a high quality habitat.

So upon creation of our habitat maps we looked at direct changes to habitat, and that was calculated from the deve -- development footprint. So when we overlay the development footprints on top of our habitat maps we remove the area underneath those footprints. Then we look at indirect changes. And indirect changes are calculated from -- from the effects of a zone of influence.

Slide 14. The point of this slide here is to illustrate the habitat mapping method. In this example here we're looking at winter habitat for muskox. And on the left is the regional study area with the LSA boundary in the middle. This is the reference landscape and on the -- on the right is the application landscape. It's the landscape described by 2010 baseline ap -- baseline conditions plus the project, so it's -- it's an application landscape.

And so imagine this map here on the left comprised of thousands of little, tiny cells and each cell is assigned a score or a rank or a category. And then based that value we identified the dark green coloured -- the -- the -- we assign the higher ranking cells as dark green colours.

So the dark gree -- dark green colours

represent high quality habitats. The brown colours, which here are lakes, represent poor quality habitat. And the take-home message here on the left is that there's a lot of high quality habitat for muskox in the RSA.

Now when we add our development layer and their associated zones of influence we see changes in the colour of the cells around developments. This is a mineral expira -- this is -- this is an effect of a mineral exploration site. This is the effect of the project. In here we can see the effect of the road on the -- on the figure on the right.

And this slide is a visual representation of 8 percent of cumulative change in high quality habitat from a reference landscape to an application landscape. An assumption across all our analyses were that the -- were -- was that the successional stage remained constant from one (1) -- one (1) condition or one (1) scenario to the next. And we think that's a fair assumption, given the fact that this is the Arctic. Environments are harsh and -- and succession moves at an incredibly slow rate.

I'm just at slide 15. I'm going to go over the concept of the zo -- of a zone of influence. Again, the zone of influence measures indirect effects from -- from active developments, developments where their permit is active from -- they -- they have -- there is permit from 2000-2005. That development during that time period is active, after which, it is inactive.

And the zone of influence can extend from 1 to 15 kilometres from active developments. It's species specific. Some people -- some people -- some species, excuse me, are more sensitive to sensory disturbances than others. It's disturbance specific. Operating mines, communities obviously have a larger zone of influence than, say, a small remote lodge on the landscape or even a mineral exploration site.

And it's not that animals are completely avoid or do not occur at all whatsoever around a mine or a mineral ex -- mineral exploration site. We know they come through communities on occasion. We know they come very close to the mine. But it's -- it's essentially describing avoidance where the probability of occurrence is lower near the project than it is outside the zone of influence.

How does it work in the assessment? We have our habitat map and then we overlay in the GIS -- we overlay our disturbance footprint and the assigned zone of influence and within the zone of influence, in the circle here, cells are reduced. For example, within 0 to 1 kilometres of the footprint, in this zone right here, cells are reduced in quality by 75 to 100 percent and the result is this mustard green colour. From 1 to 5 kilometres, cells are reduced about 25 percent. The result is this lighter green colour.

And the key assumption in our analyses for all species was that mineral exploration sites were active for the entire -- entire five (5) year permit period. But we know that isn't necessarily the case. Mining operations may only go for a month. They may only go for a year or two (2). But we assume, for that entire permit period that these camps were active for that entire time. And this actually had profound influences on -- on our effect sizes in the assessment of other value components.

That pretty much sums -- sums up some of our key concepts and our approach to the assessment that is applicable to -- to -- to all sections in the terrestrial environment.

I can take some questions now, or I can jump right into the vegetation assessment.

QUESTION PERIOD:

THE FACILITATOR HUBERT: Chuck Hubert,

Review Board. If you're comfortable with questions, we can certainly take a couple.

Any parties with questions?

(BRIEF PAUSE)

THE FACILITATOR HUBERT: Excuse me, could you please come to the table and speak in front of a microphone? And state your name first, please.

MS. VELMA STEVENBERG: Yes, I started. I'm very sorry. I didn't expect to have any questions but I have just a couple. What GIS software do you use for your analysis, please?

MR. ALAN EHRLICH: Could you please start with your name?

MS. VELMA STEVENBERG: Oh. I -- I'm sorry. Velma Stevenberg, AANDC minerals division.

MR. CAMERON STEVENS: You bet. I can answer that. I believe it was ArcMap 9.2 at the beginning, but then I think -- but at some point we -- we -- we upgraded to 9.3.

MS. VELMA STEVENBERG: One (1) more question. I noticed that you use raster instead of vector information. Was that just a matter of being able to produce the information in a more timely manner? Because I know how much longer it takes to input vector information but I would rather...

MR. CAMERON STEVENS: That's a good question. Oh, my name is Cam Stevens, with Golder. It's a good question and this is the standard approach, not just for -- for impact assessments, but in similar types of studies you would see in the academic literature.

And I think the reason why is that it's -- it's not -- I found working with vectors can be -- the analysis can be a little clumsy and -- and it -- it's easier to summarize information. And it -- and when you're look -- working across massive geographic areas and -- and you have multiple data layers, this is -- from a data management perspective, this is the way to go. Yeah.

THE FACILITATOR HUBERT: Chuck Hubert, Review Board. Any further questions on the topic thus far?

MR. STEVE ELLIS: Yeah, Steve Ellis here. Just back to slide 3, if you can go back there. I think it's slide 3. Yeah, this is the one.

So I'm just curious, like the -- the question that the Review Board itself is asking itself is: Does this project have any significant adverse impacts upon threshold value components?

The language that De Beers has used here has said, Will not have a significant negative influence on the persistence of terrestrial evaluated components.

Are we to take that to mean the same thing as no significant adverse impacts, or does that mean something different?

MR. CAMERON STEVENS: The answer is "yes".

MR. STEVE ELLIS: They are the same? Okay.

MR. CAMERON STEVENS: The same.

(BRIEF PAUSE)

MR. CAMERON STEVENS: Our statement sort of follows some concepts in the conservation literature, and maybe John could elaborate on that.

MR. JOHN VIRGL: John Virgl with Golder. Steve, it's -- you know, it's -- it means the same thing, okay. In -- in the EIS you probably see it stated a number of different ways, maybe two (2) or three (3) different ways.

Sometimes it'll have -- it's just in the writing, you know, you -- you don't want to -- writers don't like to use the same sentence structure over and over and over again, but it is the same.

The assessment endpoint persistence is -- is really a -- it's a -- it's a function of -- of maintaining resilient populations, and it's central concepts of con -- in conservation biology and resource management. And therefore, it's -- it's conserve -- it's conservative and appropriate to meet the terms of reference, and for the EIS.

MR. ALAN EHRLICH: It's Alan Ehrlich here. I've just a couple of minor questions. One (1) of them has to do with the -- the terminology aspect that you were just speaking to.

So you were talking about maintaining viable populations if then you had a population that were reduced by half, but the remaining half was still viable. I presume that would still be considered a persistent population.

I -- I don't know whether or not that would be considered a significant impact. I guess it would depend on -- on a number of other things.

But I -- I think I understand the -- the question, and I've -- I've heard your answer a bit, and it's something that -- that we'll -- we'll certainly look at, and if we have other questions, maybe IRs are -- are one (1) way we could get into clarifying the -- the terms a bit. But I -- I do appreciate your effort to try to -- to clarify that one (1).

I've got two (2) other questions having to do with -- well, one's about terminology.

Cam, your presentation, you talked about footprint. It's always hazardous to discuss footprint without clarifying if you're talking about the -- the direct footprint or the ecological footprint because of the potentially vast difference between the two (2).

My read on your slide, when you say this is less than 1 percent of the home range of the Bathurst caribou herd, it looks like you're talking about direct footprint.

Is that correct?

MR. CAMERON STEVENS: Cam Stevens, Golder Associates. Yeah, you're correct, Alan. The direct -- the -- the footprint is the direct footprint. The zones of influence that -- that we used capture possibly something else that you're describing here.

MR. ALAN EHRLICH: Thanks, that helps. Also, can you go back to slide 14, please?

(BRIEF PAUSE)

MR. ALAN EHRLICH: So where it says on the bottom of slide 14, "about 8 percent cumulative change for the above assessment," do you mean for the purposes of illustration this is what an 8 percent change would look like, or are you saying about 8 percent of the regional study area has been affected in a cumulative perspective as one (1) of your results?

MR. CAMERON STEVENS: So good question. Cam Stevens, Golder Associates. I'm going to that figure 14 here. People online probably can't see this, but -- okay. My -- my -- I guess my point is it's -- it's 8 percent change in high quality habitat from here to here. That's what that 8 percent represents.

MR. ALAN EHRLICH: And are you saying that's one (1) of your findings within the regional study area or are you just using that as an example of how the visuals work?

MR. CAMERON STEVENS: Okay. Yes, John's going to be talking about other ungulates and this exact same slide this afternoon, so.

MR. ALAN EHRLICH: Okay. Well, I've got a couple other questions about this, but I'd -- I'd rather then wait just to -- to be sure I understand where you're headed with this before I spend any more time on it now. Thanks.

MR. STEVE ELLIS: Hey, Chuck, can I fire away? Okay.

Just a bit of a followup -- Steve Ellis here, with the Treaty 8 Tribal Corporation -- just with respect to the -- the language, significant and negative influence on the persistence. Thanks, Alan, for jumping in here. That's exactly what my concern is, is that the focus here is primarily on resilience.

And I guess the argument could be made if a wildlife population or whatever population of biotic being remains resilient, that's not a significant negative impact, but for people who use that resource on a regular basis the -- the availability of those resources for harvesting would be a significant adverse impact if they were changed or if it reduced people's ability to access those resources.

So you could still have a valued component, let's just say caribou, that is persistent and maintains its resilient -- resilience but is not as available as it was -- once was to people who harvest them, and that would be considered a significant adverse impact, certainly for the Akaitcho Dene.

So I think focussing entirely on resilience is not capturing the entire scope of what might be a significant adverse impact, certainly for the First Nations sitting around the table.

Yeah. And I guess just to follow up on what Alan was mentioning. He was mentioning sort of an extreme scenario, if 50 percent of a population was -- the numbers were reduced but that remaining 50 percent was still persi -- able to persist or -- or be viable.

Again, from the perspective of the Akaitcho Dene, I mean a 5 percent decrease in the Bathurst herd, even if that herd remains resilient and able to recover, would be a short-term, potentially a ten (10) year short-term significant adverse impact. So I think those are things that need to be considered, that certainly from the First Nation perspective, we're not entering this only as -- entering into the conversation purely from the perspective of the resilience of populations in the absence of human interactions with those populations.

MR. JOHN VIRGL: Thank you, Steve. Those are -- those are good comments. John Virgl, with Golder. The other assessment endpoint we use in the wildlife assessment is the continued use by -- of -- the continued opportunities for use of wildlife by traditional and nontraditional land users.

So there's two (2) parts to the question. One (1) is -- is addressing the -- the persistence of the population and the resilience of the population. The other one (1) looks at what that means to the availability of animals. And we assess how the availability of animals can change that could affect the use by human land users, both traditional and nontraditional.

THE FACILITATOR HUBERT: Chuck Hubert, Review Board. Thanks for that response. Further question on the...

(BRIEF PAUSE)

THE FACILITATOR HUBERT: And -- Chuck Hubert -- if you can state your name first, please.

MR. FRED SANGRIS: Fred Sangris, Yellowknives Dene. Very interesting on the habitat and wildlife in that area that's brought up here.

The Dene Nation, in 1974, did a study of wildlife and habitat study. Those habitat study's documents are still available. I looked at them many years ago. And because I was a barren land hunter and trapper, I -- I used to drive sled dogs in the same area. I spent ten (10) years living in the same area, between Great Bear and North Great Slave Lake, especially to the east arm, all along the treelines.

The most wildlife habitat is right --

right with Artillery Lake and to MacKay Lake and to what we call Kuelode (phonetic). "Kuelode" in my language is -- what do you call that sanctuary over to the east -- Thelon and -- what we call that Kuelode. Because most white -- white trappers -- white fox trappers like myself in the early 70s and 80s, we spent a lot of times there.

Concentrated with many of the hunters in 1975, probably about fifteen (15) trappers in that area were working there. We focussed most of our -- our harvesting to the east of that same area. And because that was a rich wildlife habitat. And we were told as teenagers that if we ever run out of caribou or food, go east. You'll find musk ox, you'll find rabbit, you'll find all kinds of wildlife in that area.

And that's the reason why I took up the -- the research on Dene Nation's habitat and land use. And I did find a very rich habitat according to their interviews with the Elders at that time. Many of those Elders are gone now.

But when I look at that, you're talking about cells of -- many, many cells in that area. Are you saying that with the Kennady -- Kennady Lake project and two (2) other sites below it, are -- they don't have any value in habitat?

Is -- is that what you're saying? Thank you.

MR. CAMERON STEVENS: Excuse me. Are -- are you referring to a specific slide? That slide? Okay.

MR. FRED SANGRIS: Yes.

MR. CAMERON STEVENS: This is just an ex -- this is just for the regional study area. There's certainly other habitats and -- and -- and I agree with you, there's probably better habitats to the east. There could be to -- to the east and other locations outside of this RSA.

This is just a -- really, what it comes down to, is a mathematical exercise to understand losses from footprints, from zones of influence, and -- and it's all relative. We're just describing habitat within this regional study area. And so, for musk ox, when I -- when I talk about it's comprised of thousands of little cells, it's -- it's a thousand little cells on your computer screen, using a GIS software package. And we just needed it described or quantified in some way so that we can draw comparisons between these two (2) types of landscapes.

I'll go -- this is just an example and I just wanted to kind of go over how we did the assessment in other sections. Later on this morning, and later today, we're going to spend more time on musk ox. We'll spend more time on -- on grizzly bear. We'll spend more time on -- on caribou and go over -- go over their habitats and -- and those assessments in much more detail. And I'm thinking that some of this material will answer your questions.

MR. FRED SANGRIS: Thank you.

MR. CAMERON STEVENS: Yeah.

THE FACILITATOR HUBERT: Chuck Hubert. Thanks very much. We have about ten (10) minutes before lunch. How would you like to proceed?

MR. CAMERON STEVENS: I -- if everyone's okay, I would be happy to go forward with the vegetation section. Okay. Break...?

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. We will leave that open to the -- to Chuck and panel to decide on how best to proceed. But De Beers would be happy taking a break if people would like a break.

THE FACILITATOR HUBERT: Chuck Hubert, Review Board. Let's take a break, in that case. I'll sense the mood of the crowd and then I'll take a -- a view of the consensus here.

Okay. So since we're breaking a little

early, can we reconvene at 1:00, please. See you then. Bye.

--- Upon recessing at 11:47 a.m.
--- Upon resuming at 1:15 p.m.

THE FACILITATOR HUBERT: Chuck Hubert, Review Board. If -- I hope we all had a successful lunch, or tasty at least.

If we -- we can get started again, we'll continue with -- with De Beers, and I understand they have some discussions be -- prior to launching back into the presentation. Please proceed.

MR. JOHN FAITHFUL: Thanks, Chuck. Oh, sorry. Thanks, Chuck. John Faithful, Golder Associates. I'm just going to respond to some comments, and just follow up with Figure 14 -- or on page 14 of your slide show there, please, Cam.

(BRIEF PAUSE)

MR. JOHN FAITHFUL: Thanks, Cam. So I just want to point out that this figure is a visual representation of the influence of the project, and other developments, on the use of habitat by wildlife.

It shows that the project and other considered developments influence the habitat that wildlife may use, or prefer. The change in colour does not indicate a loss of habitat, but a change in the way that wildlife may use the habitat.

The dark green colour is habitat that wildlife would prefer, the altered colour represents a zone of influence or habitat that wildlife may chose to avoid due to factors such as development or the fact that the habitat is not -- is not preferen -- not preferred by specific wildlife. The habitat does not change as a result of those colour -- the -- the two (2) figures that you see presented there on the left and right.

I want to remind people that the EIS predicts that there is no effect on the availability of wildlife to hab -- to hunters. And we're going to speak more specifically around wildlife effects, around the prediction of the wildlife effects later this afternoon.

Thank you, Chuck.

THE FACILITATOR HUBERT: Chuck Hubert. Thanks for that clarification. And we can proceed then.

MR. CAMERON STEVENS: I was just

wondering if I could provide some clarification. My name is Cam Stevens, Golder Associates. Thanks, Andrew.

I just want -- want to make some clarification to Alan and Steve's comments earlier. I want to start off by saying in response to Alan's comment to there being a 50 percent change, that will not happen for any species, and we can talk about -- more about this in this afternoon during sub -- sub -- in subsequent slides.

The second --

MR. ALAN EHRLICH: Just -- just before you go into your second point -- Alan Ehrlich here. Sorry. My -- my suggestion wasn't that there would be any kind of a 50 percent change. I was just trying to say, theoretically, you know, some changes in abundance may not have bearing directly on persistence. I was just using the number 50 percent to exaggerate a point for the sake of clarity.

I certainly didn't mean to suggest that the Gahcho Kue project would in any way reduce the abundance of any species by 50 percent in the local or regional subject area. I apologize if I gave you that impression.

MS. VERONICA CHISHOLM: Thanks, Alan,

we appreciate -- Veronica Chisholm from De Beers -- we appreciate that clarification.

(BRIEF PAUSE)

MS. VERONICA CHISHOLM: Veronica Chisholm from De Beers. We're going to continue with the presentation. The next presentation is on vegetation, and Cam Stevens is going to provide that.

CONTINUED PRESENTATION BY DE BEERS RE SOILS AND VEGETATION:

MR. CAMERON STEVENS: Thanks, Veronica. Cam Stevens, Golder Associates. We are on slide 16, and this is kind of where we are in the presentation. I anticipate about fifteen (15) to twenty (20) minutes going over the subject of no vegetation. And following that will be caribou.

So the subject of note vegetation is located in Section 11.7 of the EIS. And as I begin each section I'm going to start with some directions or terms that were provided in the terms of reference. For example, in Section 5.2.12 it is stated that:

"The EIS must assess the probability of introducing foreign or invasive species, must assess the potential of dust to adversely affect vegetation."

It's important to note that both of these terms or directions were addressed as secondary pathways, but together they were captured in the primary pathway of direct loss and fragmentation of vegetation ecosystems.

Slide 19. The baseline was -- was based in part on thirty-four (34) detailed plots within the LSA and RSA that describe soil types and generated a list of plant species in the -- in the RSA. And based on this detailed information compiled with additional information collected during ground -- ground inspections and reconaissance level surveys, we completed terrain, soils, and vegetation mapping for the LSA and the RSA.

This approach is consistent with other mines in the region. We also followed up with surveys specifically for rare plants and traditional use plants in 2004 and 2005, and we mapped rare species habitat potential in the GIS. And we used a ranking system that compared -- that considered habitat requirements to support the listed plant species. And -- and rare species here were defined by GNWT's general status ranks of wild species as well as a book by -- by

McJannet published in 1995 as well as COSEWIC listings.

I'll just briefly go over some of our results from some of this extensive work. There are twenty-one (21) traditional land -- traditional use plants that were observed or identified, and these were identified with the assistance of the Lutsel K'e Dene First Nation. No rare plant species were detected. And, importantly, no invasive or exotic species were detected during baseline surveys. And -- and as a side note, to date, there have been no invasive or exotic species recorded at Snap Lake.

Slide 20. This is the LSA, the local study area. It's approximately 200 kilometres squared in area, about 14x14 kilometres. In the centre of this slide is the project camp and in -- to the left and to the northwest and east of that camp is Kennady Lake.

There are two (2) dominant types of vegetation cla -- ecosystem classes in the LSA, and in this figure those are the -- the light green polygons and the dark green polygons. So we have two (2) dominant types of ecosystem classes here. One's a scrub birch - Labrador tea unit and the other one's a scrub birch - cloudberry -- cloudberry unit.

There are other less common ecosystem classes or vegetation types in the LSA. And, for example, I'm just going to highlight two (2) of them here. On the bottom right-hand corner is a willow nagoon shrub. This is a riparian-type of ecosystem class. This -- this class will not be affected by the project.

And to the left we have a water sedge - narrow-leaved cotton-grass fen unit indicated by this dark blue colour, these dark blue polygons. And I'm just highlighting this -- this area right now because some of this area will be -- will be altered from some flooding from the operation of the project. Third column, fourth row is where the arrow is pointing.

So there are common -- there -- there are common ecosystem classes, vegetation types in the LSA, and then there are less common vegetation types.

The baseline work included measurements of metal concentrations in soil and selective plants in the LSA. And this assessment considered a range of plant species. For example, berries, willows, and lichens. These were species that had broad occurrence in the area. They are valid for human and/or wildlife consumption and -- and have value as a reclamation species as well. That's slide 21.

Going to slide 22. Before I get into the details of some of the assessment, I'm going to provide some of the summary statements in the subject of note section. The threshold footprint again was 393 hectares, but in summary the project should not result in significant impacts to the persistence of vegetation, ecosystems, listed plant species, and the use of traditional plants.

There are two (2) other pa -- secondary pathways that were assessed. These were captured, essentially, in the sum -- this first summary statement at the top of this slide. The potential for introduction of invasive species will have a minor influence on vegetation, ecosystem composition in the EIS. This is a secondary pathway and it's a secondary pathway for a number of reasons.

First of all, there is a low incidence of invasive species in the Arctic and there's been none recorded at the camp or at Snap Lake to date, so far. Also, climatic conditions in the Arctic are harsh and supports only slow going envi -- excuse me, supports only slow growing environments for -- for plants.

In our -- other things to consider, such as environmental design features that De Beers is committed to, such as cleaning equipment prior to transportation and this will limit the introduction of -- of -- of non-natives. As well as monitoring into the future for the ef -- monitoring vegetation and dust into the future.

This last point is -- summary statement is that changes in vegetation in communities due to dust depositions and air emissions are -- are anticipated to have -- to be minor relative to baseline conditions. And I'll expand on this point in a few -- in a few slides and go over some of Dennis Chang's re -- results that were reported this morning.

So with regards to the assessment itself, two (2) spatial data -- two (2) databases were used. The vegetation was described two (2) different ways. For the LSA we used this dominant ecosystem classification. And this classification is consistent with that being used at other mines in the region. And we also -- so this is something that De Beers developed. A broad ecosystem unit classification was also used. This was used for the RSA and this was based on a pre-existing classification by Matthew et al.

So once we have the vegetation around the site mapped, we applied a project footprint to understand relative changes in ecosystem un -- units, relative changes in traditional land use plants. And some of the results from this assessment include that 2 percent of existing threshold vegetation will be altered in the LSA. Approximately 3 percent -- 3 percent cover of ecosystems that's -- that are known to support traditional use plants will be altered. And 4 percent cover of the systems that -- that may support rare plants will be altered.

I'm going to talk about rela -- we talk about -- a lot about relative changes and absolute numbers. Relative changes were largest for water sedge, for the water sedge, narrow-leaved cotton-grass fen unit. Approximately 8.7 hectares of available 47.4 hectares will be altered from flooding. And it's important to note that, although uncommon at the LSA scale, this unit, this ecosystem unit is -- is more common and less restricted in its distribution at the RSA scale.

So moving forward to slide 24. Now these two (2) ecosystem units are -- will be altered the most in terms of hectares affected. And we have a -- a scrub birch - cloudber -- cloudberry unit, 128 hectares of it will be altered. But because it's so abundant in the RSA only .7 percent of it is altered at the LSA scale.

Similarly, we have a scrub birch - Labrador tea unit, approximately 176 hectares of it will be altered, but rel -- the relative change is very small. It's less than 1 percent.

Slide number 25, please. Some of this material here was presented earlier by Dennis Chang. And again, he can elaborate on some of the details and conservat -- conservatisms that were considered in the models that were used for air quality modelling.

Again, a key -- a key assumption that Dennis described was that dust deposition for haul roads in winter was assumed to be the same as summer, under conditions of no water applications. You're not going to apply water to -- to winter roads in the winter for obvious reasons.

And this figure here illustrates the predictions for total suspended particulate deposition around the mine site. So this is Figure 11.4-15 in the EIS. And each of these grids in this figure represent approximately 2x2 kilometres. And the pink and purple polygons represent predictions for deposition. The lighter polygons represent lower or smaller deposition rates. The dark purple one represents the highest deposition rate.

And the dep -- the highest dep -- deposition rates will be near haul roads -- within a hundred metres of haul roads. So for the most part, des -- deposition is largely confined to the -- to the development area boundary. But they will extend approximately 1 to 2 kilometres from the lan -- from the land use -- land use area boundary, the project footprint.

So with that said, these numbers were -- were assessed for -- were considered in assessing changes to the properties of the soil and those -- that modelling work predicted that there'd be minor changes to elemental concentrations in the soil, and that these concentrations would remain below CCME -- the Canadian Council for -- of Ministry of Environment guidelines. CCME guidelines.

And -- and given these results, this -- this dust deposition was determined to have negligible effects on -- on vegetation. And that's why this was classified as a secondary pathway.

There were similar predictions, as Dennis noted -- described this morning for potential acid input -- PAI. Except that the spatial extent of PAI will be a little bit smaller than that for dust. And about 170 hectares outside the development area boundary will receive PAI loads above recommended benchmarks. Just above recommended benchmarks.

And so we could add that to the

footprint and redo some calculations. And -- and the point is that the changes in effect size will still remain small. For example, instead of a 2 percent change in veg -- vegetation at the LSA scale, the change would now be approximately -- well no more than 2.5 percent. So it's -- it's a very small -- it's not going to affect the outcome of the assessment in any way.

And that, more or less, sums up the -- the section subject of note of vegetation. We can proceed into caribou, or I'd be happy to take some questions.

THE FACILITATOR HUBERT: Chuck Hubert, Review Board. We have time for one (1) or two (2) questions, perhaps. Going once, twice, three (3) times.

(BRIEF PAUSE)

THE FACILITATOR HUBERT: Okay. Let's proceed with caribou then, please.

PRESENTATION BY DE BEERS RE CARIBOU:

MR. CAMERON STEVENS: This is a key line of inquiry. The majority of this presentation will focus on caribou for the reason that the terms of reference was extensive for caribou. And I'll go over some of those terms of reference in this section -- in a -- in a moment. In a few slides. Caribou is Section 7 in the EIS.

On to page 28 -- or slide 28, sorry.

MR. ALAN EHRLICH: Just to -- to clarify for the remote participants. So that's slide 28, and it's on the file that's on the Review Board website described as "Day 3 air quality and terrestrial," in the title. Slide number 28. And Cam has been doing a great job of keeping everyone abreast of what page you're on, but -- 28 is -- is where this one starts. Please keep up the good work.

I didn't even have to hold up my -- my sign with the word "Page number," with the question "Page number" on it, at any point. And so far you're the only presenter who's -- who's gone so far out of your way to accommodate the -- the remote audiences. We do appreciate it.

MR. CAMERON STEVENS: Thanks, Alan. So I have four (4) slides here that -- that I'm going to read right through them, and basically summarize the directions, the terms in the terms of reference. There are more terms that -- there are other terms that I left out. I just tried to provide a snapshot of the important ones. And there are certainly a lot of terms to follow, and I'm going to go over them, I guess, as quickly as possible.

In the terms of reference, the EIS must detail any effects on caribou as well as their significance and likelihood. The geographical scope must include the potentially affected portion of the range of any herd that may be affected, including but not restricted to the vicinity of the mine site, the access road from MacKay Lake, and the Tibbitt-Contwoyto Road.

The EIS must include observations from existing diamond mines, and -- and show how they've been -- they've been used to establish how far from the mine site caribou show behavioural changes. And we've -- and we sort of captured this in our zones of influence and assessment of indirect effects.

The next -- next slide, number 29, or page 29. The following information must be included in the caribou analysis: information on car -- on all caribou herds with ranges that include the area of the proposed development, as well as the Tibbitt-to-Contwoyto Road. And the herds are the -- the Bathurst herd, the Ahiak, and -- and the Beverly herds, but the

EIS and most of this presentation is going to focus on effects to the Bathurst herd.

The analysis must include an estimate of the amount, absolute and relative, of habitat loss, change, degradation, or effect of habitat loss. In other words, loss of preferred habitats or high quality habitats for each potentially -- potentially affected herd for all life sta -- stages resulting from the development, estimate of the existing habitat fragmentation at the landscape, seasonal range and local -- and local scale, the expected increase and its possible effects on each caribou herd per life stage. And we did this even -- even though knowing that there are very low levels of development in the study years that are far below any ecological threshold.

Page 30. EI -- EIS must include analysis of ways the development may influence the energy balance of caribou under different seasonal conditions, and to what extent this may effect birth rates. And this was a challenging one to address, but it was -- but it was -- but I mean, for a scientist it was a fun one. It was -- we really pushed the envelope here.

The identification of all possible sources for increased caribou mortality, and I'll go over this in a few slides. The identification of potential changes to predator-prey dynamics, and how this may affect the herds. This is a primary pathway in the -- in the assessment, and -- and it was qualitative -- qualitatively discussed, and I won't go into too much details on this -- on this pathway today.

The last one here is the identification of all cumulative effects of other past, current, or reasonably foreseeable future developments with the range -- with -- within the range of each potentially affected caribou herd, in combination with individual components or act -- activities of the proposed development. This one's a mouthful, and we address this, I think, elegantly using some population modelling tools that I'll go into some detail later.

Slide -- or page 31. This is our last slide on the terms of reference. Outline any potential measures, or actions, to minimize impacts. We covered some of this earlier. You can also see some more detail on the wildlife mitigation and management plan in -- in Appendix 7.1.

Explanation of how any proposed mitigation measures, including plans for progressive reclamation, will contribute to the suspa -- sustainability of the herds, and outline any adaptive management strategies and plans for monitoring effects on caribou into the future. And I'll go into some of these details in the slide on caribou. And De Beers is committed to monitoring caribou into the future.

Slide 32. Baseline information for caribou took into consideration traditional knowledge, and this is described in Section 5.4. Some of the surveys that we -- we -- that we -- we did in the area, in the LSA and the RSA and along the access road, have been -- have been done in the area going back to 1999. And we have surveys planned this year. And there'll be ple -- there'll be surveys again next year.

Much of the surveys and much of the -- the work has been -- has been coordinated during the summer months when caribou are moving from the calving area to the wintering area, and this is a time when caribou are most likely to interact with the project.

We've done some other interesting things, such as the -- mapping summer historical trails in the RSA that was done in 2010. And there's also been some surveys for -- for caribou movements during their northern migration.

The baseline also summarized GNWT collar data, and that -- we use this information va -- valuable information in the sense that we were able to use it to describe seasonal home ranges that I went over earlier and to describe movement patterns in the region.

And the figure on the right here is an illustration of some caribou movements in the region. We have the Gahchoe Kue project and their RSA. We have the Snap Lake project and it's RSA, and the Diavik and Ekati mines. And you can see the movement patterns of caribou in the area that are plotted using collar locations. Essentially we're -- we're connecting the dots here. That's how these paths are created.

So I'm pointing here at the map, and there's a lot of lines. It looks like my 3-year-old had taken its crayon to the slide. But there -- there are some patterns here and -- and all this information was described using GNWT collar data.

A key me -- a key measurement endpoint was with changes in the area of habitat type. And I'm going to first go over direct changes, changes from the footprint. And then I have a few slides on changes -- indirect changes from the footprint plus the zone of influence. So these are direct changes. These are -- these are losses or alterations directly from footprints of developments in the co -- the seasonal home ranges.

And the first point I want to make is that no matter which seasonal home range scale that you look at, the cumulative direct disturbances of terrestrial habitat is incredibly low in all of these -- in all of these seasonal home ranges, so less than 2 percent. One to 2 percent cover of these seasonal home ranges, and we're just looking at terrestrial cover, is actually under a development footprint.

And another important statement is that the cumulative direct disturbance on the area of each habitat type, tundra, you know, heath boulder, will be less than 1 percent per seasonal home range, and this is for both the Ahiak and the Bathurst herd. So the impacts are neg -- negligible. They're very small. They're -- they're in fact so small that they're hard to measure given the scale of the analysis.

So how do we do this? I -- I kind of went over this this morning and I'll briefly go over it again. And, first of all, we -- we create our habitat map in a -- in a GIS. And in -- in this case, we use the land cover of Canada classification, and we have various habitat types in the landscape, tundra, heath boulder, and eskers and these types of things. And then we apply our development database overtop. And these development databases remove the habitat that's immediately underneath the -- the developments, the footprints.

And we do this for a number of scenarios. We'll do it for the reference scenario, where there's no development on the landscape. Then we'll do it for 2010 baseline scenario. And we also did it for 2006 scenario. And then we did it for a -- an application scenario, which is essentially the 2010 baseline landscape plus the project. And then we considered a future scenario, which included the project and the Taltson development.

So we have these various scenarios and then we'd -- we'd do some summary -- statistical summaries for each scenario, and then we look at relative changes. And that's how we -- we -- we look -- examine changes in our measurement endpoints.

Now I'm going to speak to changes to habitat quality. The first statement I want to make here and this is in reference to the zone of influence, the combined changes from dust deposition, noise, and other sensory disturbances is predicted to be within 15 kilometres from the project footprint. This is essentially what we call the zone of influence.

It's important to note that from mining operations background -- the -- the noise from background -- the noise from mining operations actually reach background levels at 3.5 kilometres from the footprint. So this 15 kilometres is a very conservative number based on the predictions from noise and air quality.

Another statement -- key statement here I want to begin with is that the magnitude of cumulative declines in preferred habitat, these are high and good quality habitats, from direct and indirect effects, where indirect effects take into consideration the zones of influence, across seasonal ranges is predicted to be low, ranging from 3 to 7 percent for the Bathurst herd.

And the largest change in preferred habitat that -- that was serv -- was observed was for the autumn rut period. And I don't want to go into too much detail here, because we -- because we already went over this, but the approach is very similar to what I described for the direct effects. In this case here we're mapping preferred habitat using a model. And then we're over -- overlaying the footprints and then the zone of influence. And the zones of influence are really -- are -- are reducing the quality of -- of the habitat underneath that zone.

And again, we -- we calculate -- we have

-- we have statistical summaries of the reference landscape of the 2006 baseline landscape, the 2010 baseline landscape, the 2010 baseline landscape plus the application, or plus the project, which is the application landscape, and then we have a future scenario. So we have, I think, if I just said that correctly, we have six (6) conditions quantified across time for this assessment.

Conclusions for the habitat assessment for caribou included the -- the -- the largest decrease in preferred habitat was -- was observed in the autumn rut range.

And this table here on slide 35 -- sorry, we're on slide 35. This table here is something that -- that's very similar to what is in the Section 7 of the EIS. And I'll -- I'll take you through it.

There's two (2) important points to make here. First of all the incremental decrease from 2010 baseline to application was 1.4 percent. This is essentially a summary of the -- the two (2) numbers in the 2010 baseline to application column, the grey column, the two (2) top numbers.

So that's actually minus 1.4 percent -- or 3 -- 3.7 percent. The other number is the -- the summary of the two (2) -- two (2) numbers at the top for the reference to future column, the brown column. That number sums to approximately 7.2 percent. So cumulative decrease from reference to future was 7.2 percent.

A couple other interesting things to -- to note here, first of all, the majority of losses on the landscape actually occurred prior to 2006. If you look -- be -- just at the top, the high and good quality numbers for the brown/green columns, add those numbers up and it's -- essentially suggests that the most losses occurred prior to 2006.

And another interesting observation is that there was actually gain in habitat from 2006 to 2010. This is because of the slowdown in the -- in the economy and that there were fewer active mineral exploration sites on the landscape.

So the footprint may have -- we're -- we still -- we still consider the footprint -- their footprint on the landscape, but because their permit had expired, their permit wasn't renewed, those -- those sites became inactive and that's why you see this kind of increase in habitat during that time.

(BRIEF PAUSE)

MR. CAMERON STEVENS: This -- this -- these two (2) figures we have on the left, we have the -- we're on slide 36. On the left is a historical reference map of preferred habitats for caribou during the autumn rut range, and on the right is the future condition. And the purpose here of this slide is to show you what a 7 percent habitat loss looks like.

Remember that the dark green colours are -- are good -- these are the good habitats. The brown and mustard looking colours are the -- are the poor habitats.

The take-home message here is that, you know, there -- there remains an abundance of preferred habitats on the landscape despite the hundreds of developments and the zones of influences in the future condition.

One (1) of the assumptions in this analysis was that the successional stage -- successional stages were static. They didn't change from one (1) condition to the next. And again, we -- we thought this was a fair assumption, given the -- the Arctic environment and the pa -- the pace of -- the pace of succession in the Arctic.

I can highlight here a couple of developments on the map underneath the future condition title. Here's the Gahcho Kue project. Here it's -- you can see its effect around -- on -- on habitat by the brown ring around the mine site.

I'm going to try and find another mine here. Northwest of Gahcho Kue is the Ekati mine. And you can also see a similar effect on -- on habitat quality around the Ekati Diavik mine.

So the quality of these habitats were defined using a resource selection function by -- that was developed using GNWT collar data and it's published in a well published, well known paper in wild manag -- Wildlife Monographs by Chris Johnson.

So I'm going to switch gears here a little bit and we're going to move to slide 37 and talk about energy bud -- budgets and caribou energetics.

Now first of all, why consider energy -- energy budgets? Well, the first reason is that it was in the terms of reference, right? So why was it in the terms of reference?

Well, it's important because sufficient energy reserves must be met by late autumn for -- for cows, for caribou cows on the landscape to increase the likelihood of reproducing and producing a calf the following spring.

And from late -- and so from the post

calving period to -- to late autumn, there are a number of energetic costs that a caribou may encounter along her movements on the landscape, including the costs associated with disturbance or agitation from sensory disturbances, such as noise, a blasting, a moving vehicle, the presence of a human walking. These types of things could agitate and disturb a cow during her movements to the wintering areas, and while she's foraging on the -- on the -- on the summer seasonal home range.

There are certainly other factors to consider here, such as insect harassment. Insect harassment can -- can also deplete, or -- or have energetic cost and -- and -- and affect the female while she is moving to the -- to -- to the wintering areas.

So on the right here is a figure. This figure is not illustrated in the EIS. On the X axis is body mass in kilograms and on the Y axis is parturition rate. This is the probability -- it's a scientific term for def -- that's essentially defined as the probability of a caribou producing a calf the following spring.

And the -- the -- the relationship that we essentially used in the EIS is this, the -- the steeper line, the green line. And from that line -- from that relationship, essentially we get that 1 kilogram loss in mass, reduces parturition, calf production, by 0.063 units.

And we used this relation because it was a very conservative relationship to use to understand effects to -- to caribou energetics and caribou populations.

If we had used -- there's another model, it's a new model. It's -- it's in the grey literature. It's a model that's -- that's being considered by regional biologists. It's -- we'll just call it the Daniel model, the Daniel et al model. It's -- it's a relationship, essentially.

If we had would have used that relationship in our EIS, we would get not a decrease of point zero-six-three (.063) units, but a decrease of point zero-two (.02) units.

So our -- from this -- from this angle, our -- our energetics model is -- is three (3) times more conservative than that used by another researcher.

Again I'll just go over this one (1) more time. So cows, cow on the landscape, after leaving the calving area, we encounter multiple sensory disturbance as she moves to the wintering area. And because of those encounters, energy is expended. There -- the -- the animal loses weight. There's a loss of endogenous reserves. And because of that loss in weight and mass, there's a reduction in calf production the following spring.

We're on slide 38, sorry. And what this means is that there's potentially effects to the population. So this is my pathetic re -- recreation of how a caribou moves on the landscape.

So we try to quantify this using GNWT -- well, we did quantify exactly what I just showed you here using real data.

Slide 39. And I'm going to begin first with the -- the main key -- key conclusion from this work, and that is that the magnitude of a cumulative decrease in fecundity or -- or parturition, sorry, from the project and other development is predicted to be low, less than 3.1 percent.

The first thing we did was to take the GNW's collar data, and -- and we constructed paths per year for each animal, and that resulted in a creation of a hundred and ninety-four (194) individual paths that were examined.

And because we were looking at the period from after the calving period to just before winter started, the exposure period was a hundred thirty-eight (138) days .

And encounters were measured two (2) different ways. It was a GIS analysis, and I'll go -- I'll just going to go over -- I'm just going to move to the...

(BRIEF PAUSE)

MR. CAMERON STEVENS: Can you hear me okay? So we calculated encounters with disturbance two (2) different ways. We looked at how -- how many times an animal would intersect a zone of influence. So here, this is a path for one (1) animal, this is a path here for another animal, this is a path here for another animal, and there are four (4) animals here going through the zone of influence. So that -- we called that one (1) encounter. And we followed this path through it's entire hundred (100) -- during this entire hundred and thirty-eight (138) day exposure period.

In addition to the number of times a caribou may encounter one (1) of these zones of influence, we were able to calculate the time an animal spends near a mine site by calculating the time it enters this -- this circle, and the time it leaves, and we sum it up for the entire duration of her movements from the calving area to the -- to the wintering area.

And then once we have that number, once we know how many times a caribou encounters a zone of influence during her movements, we relate -- we -- we try to understand energetic costs by -- by linking -- by -- by understanding what the energetic cost is for one (1) disturbance.

And using a previously published model by Corey Bradshaw published in 1988, Canadian Journal of Zoology, I believe, we determined that -- that one (1) intersection with the zone of influence results in -- in a loss of .047 kilograms.

And there are a number of conservative assumptions associated with that number, point zero-four-seven (.047). It is assumed that the animals, when they did encounter a -- a zone of influence, a development, that the animals were excited for a twelve (12) hour period -- twelve (12) hour period and that they ran for 2 kilometres.

So -- and another assumption was that weight loss from that disturbance event was permanent. There was no compensatory foraging or behaviour to make up for that cost.

For comparison we calculated the energy cost during a day of insect harassment, which we define as a day of, you know, no -- very little wind and warm temperatures. You know, it drives us crazy. It drives the caribou crazy and there's an energetic cost for -- in those environments.

So using some long-term meteorological data we were able to answer the question of how many insect harassment days are caribou exposed to. And -- and we propose that the caribou may face up to forty-four (44) days of high insects. And what does that mean for weight loss during the summer? It means that a female cow may lose up to 6.6 kilograms of mass.

And with some pretty novel interesting GIS work we were able to answer the question of how many disturbances, zones of influences, do caribou encounter or intersect on average during -- during a movement on the landscape, and that number is about nineteen (19) disturbances.

And based on that -- that value -- that nineteen (19) disturbances and -- and that value of .047 kilograms per disturbance shown on the previous slide results in a loss of -- of up to .5 kilograms of mass. So relative to insects, the effect is ver -- is very minor. And this number -- this conclusion assumes a very strong respo -- response to most of the encounters that the -- that the -- that a female may -- may inter -- interact with on the landscape.

So what are the implications for -- for reproduction and for calf production the following spring? The effects are minor, a loss of 0.5 kilograms, decrease of parturition -- parturition rate, reproduction by about 3 percent using the model that's in the EIS. If we use another relationship that's out there, parturition decreases by about approximately 1 percent.

So this just illustrates one (1) of the conservatisms in -- in our section that is really an -- this -- it's just we've taken the conservative approach here and many other places, and this is just one (1) example.

Okay, slide 41. I'm changing gears a little bit again. I'm not going to spend too much time on the statistics or the details here, but we -- we ran these population viability analyses tests to -- to -- essentially to meet the terms of reference.

And they were, like I said earlier, an elegant way of capturing population level effects from habitat loss and energetic costs. And, again, so we think it was the best way to meet the terms of reference.

But the -- some of the key statements or conclusions from -- from this work were that incremental changes from the project did not influence the persistence of the Bathurst herd. Cumulative changes from the project and other developments were statistically significant and moderate in magnitude. And population persistence was most sensitive to changes in adult cal -- cow survival and changes in harvest rates.

So these statements here are based on the comparison of model outcomes. For example, we compare on outcome generated from the reference landscape to the outcome from a future -- future landscape. The goal here was in no way to -- to make specific predictions of population viability or abundances in thirty (30) years.

One (1) other point here I want to make is that these statements are based on simulations of models in -- using the -- the RAMAS software package, and there are hundred of PVA papers in the peer review literature, and many of these do exactly what we did in this EIS.

So graphically some of these conclusions are presented in the next couple of slides. And -- and on the 'X' axis here we have our comparisons. And this first one (1) here is -- I've called EIS Incremental Effects, where we compared the 2010 baseline model simulation to the -- to the application model simulation. Take-home message here is that the incremental effects from the project are incredibly small.

In this simulation here we compare the reference landscape model to the output from a future -- future model and the percent change is minus 12.2 percent.

So on -- on the Y axis here is a percent change at year thirty (30). All models were ran for -- for thirty (30) year simulations. These are just models, they're simulations.

And the key message here is that the -- the cumulative effects that were modelled are relatively small compared to changes in -- compared to other factors on the landscape.

If you compare a model at -- where you assume low insect harassment to a model that assumes high insect harassment, you have -- you have massive -- you have large changes in -- in -- in the percent change at year thirty (30).

And we've done some follow-up work on --

on these PVA tests. And John and I want to acknowledge ENR for -- for challenging us on some of this work. And we've done some followup based on their comments. And one (1) of the interesting things that we found, if that -- if we do make some subtle changes to our energetics model it has profound in -- in -- effects -- or implications for our PVA te -- PVA test.

And on the previous slide I -- I reported this twelve (12) -- this change in this value of minus 12.2 percent. If we modify our energetics model and use a Daniel Model, that relationship that was described in that figure, cumulative effects are actually at minus 3.7 percent.

And if you think our starting inputs for any of the vital rates that we use in our -- in our models are off, or potentially ina -- inaccurate, we've modified them within their natural ranges and run a sensitivity analysis to show that this -- this effect size remains consistent around 4 percent.

So that value there of minus 4.4 percent is -- is the average of twenty-seven (27) new PVA tests where each test compares a reference landscape, the output from a reference landscape to the output from a future landscape.

This is just -- is -- I'm -- I'm not

going to go into too much detail. This is just a slide to show you some of the output from some of this analysis. And, you know, we ran over fifty-five (55) -- we've -- we've run like well over fifty (50) new simulations and -- and twenty-seven (27) PVA tests and each test that -- that -- one (1) -- one (1) row here represents one (1) test.

And essentially, each test represents a unique natural environmental trend that might influence vital rates over a thirty (30) year period. And the average of all these tests, there are twenty-seven (27) new ones, was minus 4.4 percent.

(BRIEF PAUSE)

MR. CAMERON STEVENS: I'm going to just spend a couple minutes -- a couple more minutes explaining this slide here. So this is a new -- this is a new PVA test, C -- C1F1 in the first row, this is a new PVA test we ran.

And in this case here we assumed that spring condition was con -- and related effect to parturition rates, calf production the following spring, was constant across the thirty (30) year period.

And then we -- then we said, Okay, well let's say insect harassment conditions are going to get worse over this thirty (30) year period and then change parturition based on this relationship between parturition and insect harassment.

And in this case here we -- we decided to keep calf survival at a constant rate across the thirty (30) year period. And we would run that PVA test -- or we'd run two (2) models, compare the results, and in this case we have a difference of minus 5.7 percent in the cumulative change on final abundance.

We also have other statistics that we report. We report changes in risk curves, the D-statistic and associated P-value.

So, I went over C1F1, multiple combinations and twenty-seven (27) combinations -- actually more than twenty-seven (27) combinations were evaluated and the main point is that the effect size is insensitive to potentially inaccurate model inputs in our models.

So the models overest -- estimated -- slide 45. The models overestimated the effects of human development. The resu -- in other words, the results were biassed, but they were biassed in the right direction.

And we -- we've done some follow-up work, based on some feedback from ENR, and these sensitivity tests, using a natural range of inputs, show that the assessment conclusions don't -- don't change.

In other words, the influence of potentially inaccurate inputs -- could be calf survival, carrying -- carrying capacity -- on the predictability of the assessment is minor.

And the precision of the assessment was maintained in part by executing a thousand simulations per -- per sim -- per model, over a thirty (30) year period. And at the -- and at the end of the day, the approach provides confident and ecologically relevant impact predictions.

Okay, on to slide 46 and changing gears a little bit again. This one (1) -- the next couple of slides will discuss the effects of the winter access road. And these -- these -- these slides are relevant for not just caribou but for moose, for muskox, for -- for wolverine and grizzly bear.

In the terms of reference for the project, the analysis must include potential development related changes, in other words, inc -- for example, increases in access to harvest levels for each population.

In the EIS, this pathway was con -- considered minor for wildlife species for the number -- for the following considerations. First of all, access is restricted.

The Tibbitt-Contwoyto Road is open only on average for about two (2) months each year, sixty-four (64) days, from early February to mid-April. Harvest for residents and nonresidents is regulated and -- and De Beers -- De Beers' staff will be prohibited from hunting while -- while on site and while using that road.

There's additional considerations. First of all there's been no evidence of harvest along the Snap Lake winter access road. The Gahcho Kue winter access road for the project is at kilometre 271, and this is 43 kilometres further -- further than the winter turnoff -- the turnoff to the winter road for Snap Lake.

And there's other -- there's other considerations here. For the Bathurst cari -- caribou, the winter access road right now actually extends outside the current core winter range. Based on GNWT collar data, the existing core winter range, using 2006 to 2010 information, is west-northwest of the project.

However, with that said, we admit that as the herd -- herd -- herd size grows over the net few years, we expect that the core winter range will expand and eventually overlap with the RSA. And with that said, De Beers is committed to monitoring, with -- with ENR, hunter use and harvest along the winter access road into the future.

In summary, the landscape will remain intact. This is page -- or, sorry, slide 48. The landscape will remain intact and well bef -- below any ecological threshold where fragmentation effects can occur for wildlife.

The impacts from the project should be reversible, except for the residual footprint, such as the mine rock piles. The project and other developments should -- will not have a significant, adverse effect on the persistence of caribou populations. And confidence in this prediction is based on consistently low effect sizes across the analyses and the suite of conservatisms that were considered in the -- in the models and in the various steps of the assessment.

Slide 49. And I'd be happy to take some quest -- John and I and -- and De Beers would be happy to take some questions, or take a break, whatever you guys would like to do.

QUESTION PERIOD:

THE FACILITATOR EHRLICH: We're going to do some questions before the break. See how many there are. We might break up the questions with the break, depending on if people have that many.

But, Cam, I -- I thank you for that -- that presentation. I see that Henry Zoe of the Tlicho Government has a question, or comment.

MR. HENRY ZOE: Thank you. My question, I guess is, what is the likelihood of the project -- of this project -- would it slow down the Bathurst herd recovery over the mine's fifteen (15) year lifespan?

If you go back to slide -- I think it was on 41, it says that:

> "Increment changes from the project did not specifically influence the persistence of the Bathurst herd."

However, rather than focus on persistence of the Bathurst herd as the endpoint for the analysis, is it possible to interpret the results, or run the models to address related by separate question on effects to rate of herd recovery?

For example, coal management in our area, decisions were made recently to drop the level of hunting on our Bathurst herd so that the population trend may stabilize, and -- and recover.

I wonder if the analysis can address the question: In combination with previous, existing, and future development, what is the likelihood that this project would slow the Bathurst herd rate of recovery over the fifteen (15) year mine -- mine life?

Thank you. That's my first question.

THE FACILITATOR EHRLICH: Thank you for that. Does the De Beers want to discuss it for a minute, or are you good to respond?

MS. VERONICA CHISHOLM: Give us two (2) seconds.

THE FACILITATOR EHRLICH: Okay, you've -- a sign of a good question is always when they have to caucus to make sure that everyone's got the best thinking in the answer.

I -- I suggest you hold off on your second question until -- until they've had a chance to answer the first, so we'll just take one (1) minute.

(BRIEF PAUSE)

THE FACILITATOR EHRLICH: Okay, it sounds like De Beers' team is ready to go, so please proceed.

MS. VERONICA CHISHOLM: It's Veronica Chisholm, from De Beers. We appreciate your patience on that. And we just want to make sure that we understand your question so we can respond to it and get the right answer for you.

So your first question was: What's the likelihood of the project effects on the Bathurst herd? Is that correct?

MR. HENRY ZOE: Yep.

MS. VERONICA CHISHOLM: I'm going to have Cam respond to that first question.

MR. CAMERON STEVENS: Well, these models I think really kind of drive home the point that there -- there is no incremental affect from the project. These -- and the models that we ran were incredibly conservative and we really went out of our way to overestimate effects at various parts of that analysis. So the project itself will have no affect.

THE FACILITATOR EHRLICH: So if I understand what I've just heard from Cam, and I'm not sure that I did, did you just say that the project itself -- do you refer to that in isolation, not in a cumulative context then, but by itself, that's what I'm getting out of that, will not have an effect on the rate of recovery of the Bathurst caribou herd?

Is that -- is that where you're headed?

MR. CAMERON STEVENS: That's correct. And with regards to the project plus other developments on the landscape, the cumulative effect, we've -- you know, we're probably going to hang our ha -- hat on the number of about 4 percent, and that 4 percent change applies to -- what I was trying to illustrate in some of our follow-up work that we've done is -- is to illustrate the point that no matter if the -- the population is increasing or decreasing or stable at five hundred thousand (500,000) animals, the effect size is the -- is 4 percent.

So the cumulative effects of the project and all developments on the landscape is -- is 4 percent -- is a 4 percent change in final abundance in thirty (30) years. Does that -- does that answer your question?

THE FACILITATOR EHRLICH: I'd like to just get a little clarification on that. If you could go to slide 43, please.

So the -- the part where I got confused is where it talks about new cumulative effects. Are we talking about the project's addition to existing cumulative effects when you talk about new cumulative effects?

MR. CAMERON STEVENS: Sorry for -- for that, Alan. My name's Cam Stevens, Golder Associates. That -- it's just a new cumulative effects test. That's -- that's what that description was meant to -- to convey. So this is -- that's -- and some follow-up work that John and I have done since the EIS has been submitted.

THE FACILITATOR EHRLICH: And you've mentioned in your response that part of this has to do with the conservatism of the model that was applied by De Beers. What was the reason for using a conservative approach by De Beers in this assessment? Why did you feel this would be a reasonable thing to do in this circumstance?

MR. JOHN VIRGL: John Virgl here, Golder. I just wanted to clarify, the -- the new cumulative effects tests that you see up there are the result of the -- of our discussions with ENR and -- and -- and their concerns over -- or chall -- challenges that they put forward to us in regards of -- of taking a more rigorous approach to the analysis. So that's what that means.

The reasons why we use conservativisms in -- in -- in the assessment and throughout the assessment was to deal with the uncertainties around -- around some of the information, the data and our -- and our knowledge about -- about caribou and wildlife in the Arctic.

THE FACILITATOR EHRLICH: Thank you. So that's why you used the EIS model instead of the Daniel model? Is it Daniel or Daniels model, if I understand the presentation correctly?

MR. CAMERON STEVENS: Hi, Cameron Stevens here, Golder Associates. That's a good question, Alan. At the time of the assessment that -- again, that relation -- we didn't have a relationship in the peer review literature that was -- that was easily accessible, that we can go forward with.

So based on some information published in the early 1990s, very good studies, very good work, I think this was for the porcupine herd, we -- we took that relationship and made it a little bit more conservative, right, because we wanted -- you know, there's some uncertainty here and we wanted to -- to reduce and eliminate uncertainty so we -- we -- we just applied a more conservative relationship in -- in understanding the effects of weight loss on -- on parturition rates.

THE FACILITATOR EHRLICH: Thanks. So on slide 41, can you go back to 41 then?

(BRIEF PAUSE)

THE FACILITATOR EHRLICH: Two (2) slides back at slide 41. Yeah, that's -- I think, what, one (1) -- one (1) more. That's forty (40). There we go.

(BRIEF PAUSE)

THE FACILITATOR EHRLICH: I'll try -- I'll try to do it without looking at the -- without looking at the slide. So if I understand that correctly then, what you're saying is that the EIS approach to the model that came up with the estimate of a 12 percent change at year thirty (30) in terms of cumulative impacts on caribou, you -- you since viewed as overly conservative and goes too far to compensate for the unknowns in the system.

So you're saying that there are presumably then less unknowns and you're comfort with the Daniel model has increased? I don't want to put words in your mouth. I just want to make sure we understand why you've gone from the predicted 12 percent change to 4 percent change, and -- and understand clearly the reasoning behind that, because I -- I -- I also understand the reasoning you've said you've taken the conservative approach.

And -- and so if -- if you're -- you're not -- if -- if you're going to adopt a different approach it -- it -- it helps us the better we can understand why. Thank you.

MS. VERONICA CHISHOLM: Veronica Chisholm from De Beers. Thank you, Alan. I think that I just want to take a step back as to what we mean by conservative approach and why we use that term.

Part of the reason why in environmental assessment you use a conservative approach is you want to be able to predict the maximum impacts. So you don't want to be able -- you want to be able to capture all the possible impacts associated with a project.

And sometimes we can over predict an impact, but we think that would be better than under predicting a -- an impact, and hence a conservative approach is often used. That's, I guess, an answer to one (1) question and I'll have John expand on the other.

MR. JOHN VIRGL: John Virgl from Golder. Alan, this goes back to my presentation on Monday, and do you remember one (1) of those slides at the end there talked about uncertainty in the EIS? And uncertainty in the EIS is not about just identifying the areas of uncertainty and why the -- they're -- we have uncertainty.

But it's about how we dealt with those uncertainties. And -- and when you -- and when you have uncertainty the best way to deal with it is to be conservative on the size that you won't -- the impacts will not be worse than predicted.

So that's the reasons why.

THE FACILITATOR EHRLICH: Got it. I think I -- I understand your response.

And, Mr. Zoe, do you have other questions? I believe you indicated you had more than one (1).

MR. HENRY ZOE: Yeah, I got -- I got a couple more anyway. On slide 48, in regards to 40 percent habitat loss, I just want to know what De -- can De Beers explain the thinking behind suggesting that caribou can sustain up to 40 percent habitat loss?

MR. CAMERON STEVENS: Hi. Cam Stevens, Golder Associates. I'm not exactly sure that's what we're trying to say. This is just -- this is a -- this is ba -- this is based on some -- quite a bit of research, a synthesis of -- of a large number of fragmentation studies that have been conducted all around the world in various ecosystems.

And, at this threshold, it's -- you know, it's just -- it's -- it's an ecological threshold, a theoretical threshold, a point at which the effects of fragmentation begin to manifest itself.

It depends on the species. It depends on the -- the landscape setting. It depends on can -- on how animals move. But it's -- it's -- it's an agreed -- it's a number that's accepted in the peer review literature. And it -- and it -- and it does provide a gauge as to -- as to the condition of the existing landscape for this assessment. And it's one (1) of many gauges.

Our -- John could -- could speak to some of the -- to the assessment approach and the effect sizes that were used in the assessment, which are consistent with this philosophy.

THE FACILITATOR EHRLICH: Before getting to John, I'd just like to ask the folks who recently came in. There's a sign-up sheet on the table, just back there. Please grab the sign-in sheet, circulate it and make sure that everyone signs in. Thank you.

And, John Virgl, do you want to add anything to Cam's response?

MR. JOHN VIRGL: John Virgl here with Golder. Thanks, Alan, I will. Yeah, to continue on with Cam's explanation there, we are not suggesting that the 40 percent is a threshold for caribou, that caribou could handle a 40 percent loss of habitat. It's a -- it's a value that's taken out of literature that -- that basically provides a benchmark, if you will.

The actual high magnitude classification in the EIS for all wildlife was a 20 percent change. Okay, so that's well below -- that's twice below the actual threshold from the literature. So, we were erring, again, on a side of a large margin of safety or conservatism. Even using that high magnitude of 20 percent change, as Cam showed in his presentation, the maximum area within zones of influence on the landscape for the Bathurst herd is about 6 percent and the maximum habit change in -- in good and quality or preferred habitat was during the autumn season, basically from the post calving till October. And that was 7.3 percent change.

THE FACILITATOR EHRLICH: So if I can paraphrase, just so that I know that I -- at least I can tell you what I think I've heard. The 40 percent habitat loss doesn't refer to the total loss of habitat. It refers to when fragmentation effects start to matter with respect to the amount of habitat.

Habitat loss can affect wildlife in other ways besides fragmentation. And it -- it doesn't sound like it was your intention to suggest that 40 percent habitat loss is going on, or that caribou could sustain a 40 percent loss of habitat.

I -- I -- I just want to make that quite clear because I don't want -- particularly our remote listeners who aren't able to see what's going in the room, to walk away with the wrong impression from this discussion.

MS. VERONICA CHISHOLM: Veronica Chisholm from De Beers. Yeah, I want to make it perfectly clear. The project is not predicting a 40 percent habitat loss. This is just a way to evaluate fragmentation. And that was a threshold value taken from the literature. It's not a predicted value from the project. Thank you.

THE FACILITATOR EHRLICH: Thank you.

And, Henry Zoe from the Tlicho

Government, do you have other questions on the subject?

MR. HENRY ZOE: Okay. Yeah, because just on that last explanation that they've given me, but, you know, right through the whole EIS binders they've given us and even in the slide, there's always reference made to this 40 percent habitat loss. That's the reason I raised that, because it's confusing.

Anyway, my other question on the wildlife effects monitoring program, I wanted to ask a question pertaining to that. Are there any lessons learned that De Beers can share from the studies that might be applied for the wildlife effects monitoring program?

I guess -- for example, I guess if the broad goals of the -- of your wildlife effects monitoring programs are to, one (1), test impacts prediction that have been developed in the EIS for caribou, and secondly, adaptively manage -- manage the project to protect wildlife and habitat, will De Beers design, coordinate a resources monitoring program with an emphasis on insuring sufficient and successful power to detect the magnitude of impact it predicts? Thank you.

(BRIEF PAUSE)

MS. VERONICA CHISHOLM: Veronica Chisholm from De Beers. First of all, Henry, we appreciate your comment and apologize for the confusion over the 40 percent.

Sometimes we don't always put ourself as the reader, and so those comments are very helpful. So I'd like to thank you for that.

Second the -- secondly I'd like to say that De Beers will be monitoring -- will be developing monitoring programs to evaluate the predictions in the EIS. So I think, yes, I'm answer from your -- I think yes is the answer to your second question. I hope I -- I hope I've addressed that, but, yes, that is our plan.

And we also plan to consult with the communities on the monitoring program, and the development of the monitoring programs. Thank you.

THE FACILITATOR HUBERT: Chuck Hubert, Review Board. Was there a -- a lessons learned question in there, as well?

(BRIEF PAUSE)

THE FACILITATOR HUBERT: Chuck Hu -- oh.

MR. JOHN VIRGL: John Virgl, Golder.

Yes, Henry, we will definitely be taking lessons learned from the other mine sites. Part of -- a lot, actually, of what's in our conceptual monitoring and mitigation right now is from lessons learned at the other operating mine sites, including Snap Lake, and Diavik, and Ekati.

THE FACILITATOR EHRLICH: Are there any other questions from the Tlicho Government? I see that Madelaine Pasquayak has a question.

MS. MADELAINE PASQUAYAK: Madelaine Pasquayak. I was just looking at your slides, and I -- I -- one (1) question that ran through my mind was your -- your terms of reference.

It just, you know, occurred to me just -- just looking at your key line of inquiry, I was just kind of curious as to whether you got any assistance from the Dene groups in -- in forming these line of inquiry.

THE FACILITATOR EHRLICH: It's Alan Ehrlich. I can certainly answer that question, although most of the question period here really should be directed to De Beers, but I -- I think it's a -- it's a valuable question.

The terms of reference that the panel released considers the results of scoping done by the

Review Board, which I was in -- involved in.

The Review Board went to a number of different communities, and spent a while with each community finding out what issues the communities want looked at, and how the community would prioritize those things, if they were the panel, or -- or in that case the Board. This was before it was referred.

So there was -- there was quite a bit of community input into -- into this particular model. Of course, the Review Board, and then later the panel, also used it's own experiences, which come from numerous hearings. And other -- other opportunities to hear from community members, Elders, and leadership to reflect on what it has heard is also important to communities.

And -- and so all of that resulted in what went into the -- the terms of reference, in addition to comments from other groups like government expert agencies, and the -- the Board and panel's own -- own consultants that have been hired for this.

Does that help?

MS. MADELAINE PASQUAYAK: Thank you very much. Yes, it does help. And another quest -- another slide that I want to bring your attention to is where it says "Conceptual Energy Model."

There's a lot of information out on -- on calving -- calving of -- of calves, and -- and their -- and their migratory routes. There's a lot of information there.

I was just kind of curious, the -- the one (1) I know the -- the Elders are always concerned about the health of caribou. The -- the one (1) thing that they always stress is that -- that whatever project is out there, anytime that anybody works with caribou, or around caribou, the one (1) thing that they should seriously consider is the health of the caribou.

And I recall years ago when I was -- maybe forty (40) years ago I remember, when I was quite young, my dad and other men in the community would go hunting into the barren lands. And the one (1) thing that I noticed was that every time they brought caribou home, when they go to the barren lands by boat and come back by same, they always brought back big slabs of fat, you know, indicating that -- that the caribou were healthy back then.

As of late, I've noticed that whenever our men from the community go hunting, there's always so very little fat, and I wondered if that's something that -- that shouldn't be considered in the study to --

to determine why, you know, there's so little fat on the caribou.

Is it something that's -- that's affecting the health of the caribou that there's little fat on -- on the bodies?

THE FACILITATOR EHRLICH: To De Beers.

MR. CAMERON STEVENS: Hi. Cam Stevens, Golder Associates. I -- I think I could answer part of your question. That loss that -- in our energy model we actually took into consideration loss of both muscle and fat, so that's -- at the bottom there I -- we have a bullet showing -- or stating that zero point -- there's a zero point four seven (0.047) cost, kilogram cost, associated with -- with one (1) entry disturbance.

That cost, that weight takes into consideration fat and -- and muscle. And the same thing for that second bullet. So we've -- we've -- you know, in -- in the models and -- we've tried out best to take into consideration a loss both to muscle and -- and fat.

THE FACILITATOR EHRLICH: Thank you.

MR. CAMERON STEVENS: Did I -- did I get -- did I answer your question?

MS. MADELAINE PASQUAYAK: I -- I

recognize that there's some weight loss at the -- during the time of calving, but I'm talking about a time of all time when the calf, after ha -- after being born, they're -- they're able to walk after the -- the mother calf -- cow, pardon me.

By this time, they're -- they're strong enough that they're able to -- to wander on their own, but come fall time when the men go hunting, that's -- that's when I noticed that the ca -- the cow has fattened up. And I wondered that how come back then they were fat, but now there -- there seems to be so little fat on them.

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. Thank you, Madelaine. Appreciate those observations. I think that the GNWT has been monitoring caribou health, and they -- the literature from the GNWT may have a better answer. And I'll try and find those references for you to see whether they can help address those questions. Thank you.

THE FACILITATOR EHRLICH: Thanks for that. So I've heard a bit of homework that you're going to try and come up with a reference. If you can please try and do that over the -- can -- do you think you can do it tomorrow?

MS. VERONICA CHISHOLM: We may actually be able to do it today. So we might have that reference that we can provide. I -- we just may not have a copy of it to give to Madelaine, but we might be able to get that to her tomorrow.

THE FACILITATOR EHRLICH: Okay. That would help. Thank you.

Fred Sangris of the Yellowknives Dene First Nation, has a question.

MR. FRED SANGRIS: Yeah, Fred Sangris, Yellowknives Dene. I want to go back to -- I think it's slide 21 on use plants. I want to ask De Beers, since they did some studies or -- with communities, I wanted to ask them, since the Yellowknives Dene are people who rely big on plant, traditional medicine and plants, especially in the Arctic tundra, we are probably -- Yellowknives are very traditional people. Even to this day we collect plants in the surrounding outside of the city.

I know of rare plants in the -- in the tundra; many of the Elders do. I just want to ask them if they did any TK study on plants with the YKDFN.

THE FACILITATOR EHRLICH: So the question to De Beers then is: Have you done any traditional knowledge studies with the Yellowknives dealing with plants and plant use?

(BRIEF PAUSE)

MS. CATHIE BOLSTAD: Hi. It's Cathie Bolstad, from De Beers. Yesterday I was asked about traditional knowledge studies with the Yellowknives Dene First Nation. And De Beers has made an offer to the Yellowknives Dene First Nation to undertake traditional knowledge studies. That offer has been accepted in 2011.

De Beers has outlined to the Yellowknives Dene First Nation what it would like to see in a traditional knowledge study. And -- and usually what we would like to see is information collected in a way that meets the terms of reference for -- for the particular regulatory process that we're in in this particular case.

And, at this point in time, the answer would be no, Fred, because we have not moved forward and we're still waiting for the Yellowknives Dene First Nation to move forward on a traditional knowledge study.

MR. FRED SANGRIS: Thank you. I have another question here. Just on the -- the plans on traditional knowledge, I -- I believe that needs to happen. There are many traditional plants users in the community that could identify different plants from other communities.

It's not too late. I remember the Minister of Indian Affairs, many, many years ago when De Beers -- or BHP was going through the same thing, they told us the tra -- it's too late, the train left. But the Akaitcho chiefs came to the Minister and said, Yeah, but where are the tracks? So I don't think it's too late. I think that work still needs to be done.

My other question is -- is: What -- what is De Beers' claim block area? There seems to be a -- a lot of discussion within just that small printed area, but exactly what is De Beers' claim block area?

(BRIEF PAUSE)

MR. ANDREW WILLIAMS: Andrew Williams from De Beers. The -- the claim block area is fairly small. It's now reduced to an area of approximately 5 by 10 kilometres, 5 kilometres north/south, 10 kilometres east/west.

It's more or less centred east/west on the actual proposed mine, but the mine itself sits along the southern boundary of the claim blocks. Those are the only ones held by the joint venture.

Other parties have claims around us, but we only have four (4) left.

MR. FRED SANGRIS: Thank you.

THE FACILITATOR EHRLICH: We have -- I'm sorry, Mr. Sangris, do you have a -- an additional question?

MR. FRED SANGRIS: I have a -- a few more. I don't know how much time I have. Okay. I'll -- I'll probably --

THE FACILITATOR EHRLICH: Well, with -- with -- with wildlife ones maybe we can take a couple more now, and then we've got some vegetation questions to come back to after, as well.

So are -- are you okay with asking maybe two (2) wildlife -- two (2) questions now and then we'll -- we'll -- we'll try to catch the other ones --

MR. FRED SANGRIS: Sure.

THE FACILITATOR EHRLICH: -- before long? Thank you.

MR. FRED SANGRIS: Thank you. This one's in relation to wildlife. It's called harvesting, presentation slide 47. As De Beers or the consultants indicated that there was no evidence of harvesting. We just did our harvesting this last winter -- last spring, same with Lutsel K'ue, and we did harvesting this -- this fall, as well.

We have footprints out there, we have -- I -- I've been hunting in that area, as well, the same area, off the winter road to Kennady Lake, so there are people that go in the same area.

You're not going to find evidence, ENR or anywhere. You have to go to a First Nations first, because we do have land use information and where hunters going to -- to harvest. So that's not a question, but that's just a comment.

But my last question is: I'm not sure what slide it was, but there was a discussion on Ahiak, Bathurst, and Beverley on the -- I bel -- is it Tibbitt-to-Contwoyto?

Tibbitt-to-Contwoyto. That information came from -- Ahiak, and Bathurst, Beverley, that came from GNWT data?

(BRIEF PAUSE)

MR. FRED SANGRIS: You mentioned the collared data that was -- you used and that Tibbitt-to-Contwoyto winter road you only spoke on Ahiak, Bathurst, and Beverley, and not the Bluenose herd.

As you know with GNWT only a very small, small amount of collared caribou is used. Say, for example, there are two hundred and fifty thousand (250,000) caribou herds, either Ahiak or Bluenose, and only ten (10) of them are collared, and the ten (10) ones that are collared could stay away and the other two hundred and forty nine thousand (249,000) or so could be within the vicinity. I come from a group of hunters with the Yellowknives Dene and we always harvest Bluenose north of here.

I never relied too heavily on GWNT database, because that -- it doesn't tell you everything. You need to, again, work with the communities who have that information, as well, too.

So I know that the Tibbitt-to-Contwoyto has three (3) different herds. Well, the new one in 1996 is Ahiak, this new herd that was just done by Anne Gunn, but the Beverley -- Bluenose does come in north of Yellowknife and we do harvest it. So, I read other reports that they don't come in the area, but we know they do.

In your discussion, you never brought up the presentation of the impact of winter road from Tibbitt to Contwoyto, which in that -- because last year, every four (4) minutes there was haul trucks going up to the mines. And with Kennady project going on board, there will be -- the shorter minutes will come into play and there'll be more traffic.

And there was no mention of the -- the impact on that winter road. Because the herds and the people who make their living out there, especially my family who live at Gordon Lake (phonetic), there's going to be an increase in traffic and it could have an effect on our -- our harvesting lifestyle over there. Thank you.

THE FACILITATOR EHRLICH: Would De Beers like to comment?

MS. CATHIE BOLSTAD: Cathie Bolstad with De Beers. I -- I would like to just respond to one (1) of the pieces of information from Fred.

THE FACILITATOR EHRLICH: Cathie, can you just step back from the -- take one (1) step back from the microphone. Thank you.

MS. CATHIE BOLSTAD: Back up again. Fred, you've indicated that the community, the Yellowknives Dene First Nation, has valuable information in terms of the harvest of caribou. And certainly every opportunity De Beers has when we meet with the Yellowknives Dene First Nation, when we're --

whether we're discussing a specific traditional knowledge study or how to engage with the community on this project, our request is always if there is information that helps make better our assessment, that you can provide, that it -- that it be made available.

And we're always willing to discuss how to work to have that available. And so, my request would be of the Yellowknives Dene First Nation. If there's a willingness and you think it will add value to a better assessment that -- that information be made available in a conversation with De Beers to advance that and move that forward would be great.

And I think John -- John, are you going to address a couple of the other points or -- John Virgl will -- will address some of the other points.

MR. JOHN VIRGL: Thank you, Fred. John Virgl here of Golder. Yes, we did not in the presentation here today include the increase in traffic rates or -- or volumes from the Kennady Lake project along the Tibbitt-to-Contwoyto winter road. It is addressed in the EIS, in Section 11.8, and we will get you those numbers here by tomorrow.

THE FACILITATOR EHRLICH: Okay. So I -- I heard what sounds to -- to my ear like some homework that's going to be coming up in the very near future. We certainly appreciate the efforts De Beers will put in, too.

Before the break, I would like to ask three (3) questions that have come from the consultants to the Environmental Impact Review Panel, who are participating remotely. One (1) of them is in BC. The other is in Calgary. I'll start with BC, and that's Dr. Anne Gunn, the same one (1) that Fred Sangris mentions. She's -- she's listening on Vancouver Island, I think it is.

I'm going to paraphrase her questions. I'm not looking for responses before the break. These might take some time to think about, and this way you have the break to discuss them and figure it out.

So Dr. Gunn asked whether or not the cumulative effect of climate change has been sufficiently estimated. She notes that Section 11.13.5, the residual effects summary of the environmental impact statement, states that:

> "All of the pathways for climate change were determined to have no linkage, or minor (secondary) changes to the classification of effects from the project on the biophysical environment."

She writes:

"That appears to indicate there were no primary effects of climate change, only three (3) secondary pathways. These being water flow, processed kimberlite storage, and the winter road season. Given the ten (10) year period of construction and operation, and predictions of further climate change..."

Dr. Gunn's interested in:

"The proponent's confidence that a warming climate will not cause measurable changes with residual effects on a value component relative to baseline."

She notes that there was no discussion in the EIS of:

"The current rate of warming relative to non-linear and unpredictable effects and increase in annual and seasonable variability."

She gives an example, which has to do with caribou, which is why I'm raising this in the caribou stuff. Well, the obvious reason is if it comes from Anne Gunn, for us, it's going to be about caribou. And her specific example with caribou is in the key line of inquiry for caribou:

> "For example, population modelling indicates a large effect on caribou abundance from changes in the level of insect harassment, to which any effects of the mine would be additive."

It's not exactly a comparison, it's an addition, but an addition to a fluctuating natural background condition.

> "Insect harassment is temperature dependent and is predicted to be more severe under a warmer climate. In that case, effects of the mine additive to the effects of a warmer climate would have residual effects."

So, that's one (1) thing that she will -- that we'd -- we'd like De Beers to comment on. Dr. Gunn's next point is that:

> "It's unclear how De Beers has consistently and thoroughly drawn on the experiences at other mines in the Nunavut -- in the Northwest

Territories, which is one (1) of the requirements of the terms of reference."

She gives a -- a number of examples. I'll say them now so they're caught in the transcript, because it makes it easier for you guys to follow up. She says:

"There's no clear description, such as a summary table or map, that shows the relative and comparative footprints of existing and operational open pit mines and transportation corridors for Ekati, Diavik, and Meadowbank. There's no summary under the subjects of note or key line of inquiry, of predicted impacts and the actual measured impacts for the other mines. Some experiences, such as fuel spills, are listed, but not other spills, including processed kimberlite, or leakage through dikes. The experience at the Meadowbank Mine, which included a 110- kilometre road, are not listed, although, for

example, the effects of the road on
access for caribou harvesting are
monitored and reported."

So, that's -- that's her -- her second point. Now, the next and last point I'll -- I'll -- question I'll raise before the break comes from Petr Comers, who is our other wildlife consultant, and I need to switch seats with Chuck so that I can read his preamble from Nicole Spencer's computer, and she's sitting over here.

(BRIEF PAUSE)

THE FACILITATOR EHRLICH: Okay. Petr Comers' preamble talks a bit about a point that I got at a bit before regarding the difference between a significance determination and -- and the persistence of species.

He's pointing out that things like abundance, distribution, and catch per unit effort, even in the interim before everything persists, you know, while these impacts are going on, can still be quite important to, for example, First Nations, who -- and other Aboriginal groups who -- who use the resource.

I -- I'm just going to try and -- and cut through some of the -- the background ones. But he points out that where your mitigating environmental impacts with certain management actions, it doesn't necessarily matter how much -- no, from -- from -- it's strictly -- from strictly a per -- persistence point of view, it wouldn't matter how much a population would be reduced as long as it's still viable so that strictly speaking the resource will be there for future generations.

So that approach suggests that you'll have the opportunity to re -- use the resource later. If the resource is reduced but is still there, then future generations will have the opportunity to manage the resource to meet their needs.

You -- Petr goes on to say:

> "The definition of significance to animal populations is the fundamental problem."

Steve from the Treaty 8 Trial Corp. argued that:

> "Any reduction of the population may be deemed significant from the viewpoint of the communities."

Petr Comers agrees and has asked about

determination of significance by communities. He would like De Beers to, here comes the question:

"Please clarify how the communities were or will be involved in determining the significance of potential impacts to wildlife."

And this is shadowing for a possible IR:

"Please provide tables of impact ratings that reflect the values of communities. While impact ratings have been provided for the wildlife subjects of note, from the viewpoint of conventional scientific specialists, analogous tables should be provided from the re -- from the viewpoint of the people that depend on the land and its resources."

So anyway I wanted to get both of Dr. Gunn's comments and Petr Comers' comment out there before the break. You've got some time to ponder that. We're going to reassemble in fifteen (15) minutes. No, let's make it ten (10) just because we're a little bit behind and we've still got a fair bit of ground to cover today. Why don't we meet at ten (10) minutes past 3:00. Thank you.

MS. VERONICA CHISHOLM: Alan, it's Veronica Chisholm from De Beers. I'm wondering if we can get a copy of those in writing, even in advance of the transcript. Would that be possible?

THE FACILITATOR EHRLICH: The wording of these is specifically intended for internal use of the parties, so it would require some paraphrasing, which obviously I can't do while I'm sitting here co-chairing this. But we'd certainly be happy to help.

Tomorrow morning, what I've just said will be on the Tscript.com website, and so you can -- you can get the verbatim version then. But I'll try to help you during the break where I can. Thanks.

--- Upon recessing at 2:58 p.m.

--- Upon resuming at 3:13 p.m.

THE FACILITATOR EHRLICH: Okay, we'll start with De Beers I said looking at a mostly empty table of chairs because nothing gets people back in their chairs faster than finding out that, you know, a national webcast is ready for their response.

Would De Beers like to respond -- sorry, international webcast. Would De Beers care to respond to the -- or how would De Beers like to respond to the two (2) points raised by Dr. Gunn and the point also raised by Petr Comers?

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. We pre -- we appreciate both those comments and we would like the opportunity to spend the evening to review them and develop a response for tomorrow. I'm not going -- I'm not saying we're going to respond to all of the questions, but we'll develop a response tomorrow. Thank you.

THE FACILITATOR EHRLICH: Okay, on that, then we'll try to take those matters first thing tomorrow morning just after -- I guess after the opening comments, which means Dr. Gunn, if you're listening, please tune in tomorrow morning because there will be some caribou goodness going on in the morning.

Do you wish to respond to the question by Petr Comers as well tomorrow, or do you have anything on that now?

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. Yes, we'll respond to both Anne and Petr tomorrow. Thank you.

THE FACILITATOR EHRLICH: Thanks. I understand that Todd Slack of the Yellowknives Dene First Nation -- Todd, are you here? There he is. Todd has a few questions on caribou he'd like to ask.

MR. TODD SLACK: Thanks, Alan. Todd Slack, Yellowknives Dene First Nation. I have two (2) lines of inquiry and two (2) separate questions. And I don't know, you want the easy or the hard ones first?

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. One (1) question at a time would be great.

MR. TODD SLACK: Okay, I'll -- fine. Easy. In Cam's presentation he noted the -- the zone of influence and he -- he used the word, that we are using a 15 kilometre zone of influence to be conservative. And while, yes, that's true in that it's larger than the zone of influence that has been observed at the other mines, in terms of its application, and the -- the exact term is going to elude me, but you -- you separate it into these categories from zero to 1, 1 to 5, 5 to 15 in which this zone of influence has different levels of effectiveness, essentially what I'll call the decay curve of impact.

Now, the work that's been done at the other mines shows quite a clear decay curve which is much different than what you guys are proposing. Now, in terms of informa -- and this being the information gap session, I'd consider that to be a pretty significant gap, not because of the -- you know, the potential differences in -- in terms of what the -- the outputs will be, which -- and there will be differences, but rather here we have clear northern evidence on the -- the effects of the mines and it's not being utilized in this case.

I'm just looking for the mine -- or the Company, sorry, to provide some feedback on why they think that their method of zone influence is a better way to go.

(BRIEF PAUSE)

MR. CAMERON STEVENS: Hi, Todd, good question. My name is Cam Stevens, Golder Associates. So I'll -- I'm -- I'm going to try to -- I'm going to start this answer. I think John's probably going to step in at some point, my feeling, and my feeling is that he's going to jump in.

So first of all, the zones of influence that we use in this assessment are the largest recorded distance in the peer review literature, right. So when we started the study and we -- and we want to use something that's -- that's eco -- ecologically relevant, we're going to -- we're -- we're honestly -- we consider local information cert -- very valuable in -- in -- in -- in a -- in our assessment in understanding effects.

But just let's be clear that some of this local work is far -- to my knowledge, has not been accepted in the peer review literature and there's some debate onto the -- the actual extent of -- of avoidance around mines in general. And part of this -- and part of the -- the discussion and part of -- part of the debate is what is -- what is the underlying mechanism for avoidance. And there are a couple of competing hypotheses.

Today we've talked about sensory disturbances, noise attenuating at 3.5 kilometres. We've talked about the spatial extents of dust and potential effects on vegetation, no greater than 2 kilometres from the site.

So the question is, what -- what -- why are caribou avoiding mines at a distance of 15 kilometres, or why is the probability of occurrence lower within the zone than it is outside the zone.

And I think -- so I guess where I'm -- where I'm going with this is that -- well, first -- first of all, the other competing hypothesis is this risk disturbance idea where there's a perception of risk, right. Animals are -- the caribou are perceiving human infrastructure -- infrastructure, human activity. They're associating that activity, these -- these buildings with areas where there -- there could be hunters, where they might get shot.

And so this is why we're seeing this avoidance. And perception probably is -- is variable from one (1) animal to the next, one (1) herd to the next, from one (1) year to the next. And some of our work with the Diavik And Ekati mines have -- have clearly shown that during some years there's actually attraction to the mine site and in other years there's avoidance. There's a 15-kilometre zone -- clearly a 15-kilometre zone of influence.

And in some years potentially a 30-kilometre zone of influence. There's a lot of variability associated with this zone. And, you know, in the majority of the research on rangifer, on caribou in the literature, and mam -- mammals in general, in fact, show that these animals avoid human activity infra -- infrastructure up to distances of 5 kilometres.

So take -- taking all this information together, at the end of the day it seems like that approach was -- was conservative. And keep in mind, we've assigned a zone of influence for mineral exploration sites of 5 kilometres, and we assume that that zone of influence was active for the entire duration of -- of those permits. And this has the biggest in -- influence on -- on our assessment more than anything else. Mineral exploration sites are numerically the most dominant feature on the landscape.

(BRIEF PAUSE)

MR. JOHN VIRGL: John Virgl of Golder Associates. I'll just add a few things to what Cam was saying, Todd, and it is a good question, thank you. First of all, there is no significant gap in -- in the EIS. As Cam mentioned the -- and there's -- and all -- and the work in the EIS, there's -- there's many references to the work that's been going on Ekati, and Diavik, and Snap, and also the hei -- the -- the zones of influence are based on that work, okay?

The disturbance coefficients that we used in the zones of influence, come from Johnson's (phonetic) paper. Where he gave hypothetical zones -- or disturbance coefficients for zones of influence. The -- the -- the decay curve that you talk about is in the -- is in that manuscript by John Belanger (phonetic). And it combines the preconstruction, or the construction period, and then the operational period.

And in the construction period, it -- it was -- it was weak, it could not find any -- they could not -- the authors could not find anything. But during the operational period, by pooling the information, they did find the 14-kilometre zone of influence and a -- that probability of -- of -- of occupancy within that zone of influence. The decay curve that you're res -- that you're referring to.

Other work looking at that information, has looked at it by year. And as Cam mentioned, you look at it by year because year interactions are important. There are years when it's almost impossible to detect a zone of influence. In fact, you can't. And there are years when you can. But it's also related to the lake around Diavik and the lakes in the entire Lac de Gras region. And in some years, as Cam mentioned, caribou have -- females with cal -- with calves, were more likely to be found near the mine site than they were further away.

So we used the zone of influence from the literature, not only from the -- from literature outside of Canada but also inside Canada, and in other arct -- in other Arctic herds and from the local studies around -- in the NWT here regionally. And the Lac de Gras area particularly. And disturbance coefficients that came from a published paper on -- that was built on the satellite collared information from the Bathurst caribou herd.

THE FACILITATOR EHRLICH: Thanks, John. Todd, with the -- the remaining questions and answers, just to be mindful of the time I'm going to ask everyone who's speaking to do their best to keep it concise and please go ahead, Todd Slack of the Yellowknives Dene First Nation.

MR. TODD SLACK: Excuse me. Thanks, Alan. Well, I thought I -- I asked a very short question. But perhaps not.

With that, here is a -- a sort of multi-part line of inquiry. And it builds on what Henry was talking about in terms of this 40 percent number. And I understand that the Company has tried to clarify where this is coming from. But I need to seek a little more information.

This number comes out of Swift and Hannon, which you referenced on one (1) of those slides there. When they amalgamated their information, or they brought together all of their studies, how many of those studies that they used involved caribou? How many of the studies that they examined to derive this 40 percent number, involved caribou?

MR. CAMERON STEVENS: Cam Stevens, Golder Associates. Good question, Todd. I can't tell you the number of studies that she referenced that included caribou. But, you know, it's a synthesis of -- of hundreds of studies and a variety of species. And just so you know, the threshold that she rep -- reported is actually 40 to 60 percent. So we're -- we're -- in the EIS, we -- this forty (40) -- this number forty (40) comes up, but in -- in her paper, it's -- she gives a range of 40 to 60 percent.

And Tricia (phonetic) -- also, Tricia Swift, who was co-author of -- of that paper, the lead author of that paper, kind of described it first as -- this cheat sheet -- she gets this 40 percent number from something called percolation theory.

Imagine you have a -- you have a rectangular box. And you have bal -- it's all filled with balls going across like this, and the 40 percent is the point at which you rem -- you remove these balls, where the largest group does not go across the entire length -- the width of that box.

So, it -- it -- there's -- there's some theory, or some -- some additional concepts behind that 40 percent number than just a summary of -- of the literature.

MR. TODD SLACK: Todd Slack, YKDFN. And I'm happy, if you guys want to take this away and provide it as an undertaking. I'm happy to -- to wait. But the point of this being -- and if it doesn't involve caribou, or ungulates, or large bodied mammals along these lines, yet we're using this as an assessment endpoint, then I have to wonder what the actual validity of this as an analysis -- an environmental analysis tool.

Now, we heard a lot about conservatives -- conservatism built into the system along the way based on the data, but if the actual metrics -- sorry, John, I know that's not the word you -- if the threshold that we're going to use to evaluate whether this is a primary pathway, or is a pathway of concern, shall we say, if that is invalid then the actual EA process that you're undertaking isn't valid. So, it's swift in hand, and -- and, you know, like I'll -- I'll leave this up to you guys, and you guys can argue it out with my guys once the undertaking's in, or whatnot. Then I'm concerned that it's not an applicable value to be used within this system.

And in terms of information gaps, as -- as Henry mentioned, you know, and we've talked about this before, there's a great deal of concern about this.

THE FACILITATOR EHRLICH: Before we assume that De Beers would prefer to do this as an undertaking then as it -- something that can be resolved tomorrow, would you be open to taking a stab at this tomorrow morning?

MR. JOHN VIRGL: John Virgl here from Golder Associates. I'd like to take a stab at it right now.

THE FACILITATOR EHRLICH: Stab away, please.

MR. JOHN VIRGL: As I mentioned to you previously, Todd, it's a -- it's a value -- it's -- it's got a range of values, okay? It's -- it's looking at an abrupt change in a number of different kinds of population responses, everything from population size to dispersal, to survival, to recruitment, across a number of different taxa. And that abrupt change occurs over a very small change -- abrupt decline terms occurs over a very small change in habitat. And that -- that point where it happens is somewhere between 40 and 60 to 70 percent for different taxa.

It's a value from different taxa that we're not saying we're applying to caribou directly. We're not saying this is a threshold for caribou. We have a number of different measurement points, some include habitat -- direct habitat change and fragmentation; other's include changes to habitat quality. Those are measurement endpoints. The assessment endpoint is how those changes in measurement endpoints may ultimately affect caribou population. Abundance and distribution, and ult -- ultimately persistence.

In that context, we took our mea -- our impact classifications from less than 1 percent, meaning negligible, 1 to 10 percent, meaning low, 10 to 20 percent, meaning moderate, and above 20 percent as being high. And we get to a high, that means we're on that -- that's where significance might start to occur. That's the potential for significance.

We're not close to 20 percent. We're at 7 percent. We're 20 percent below those ecological threshold values that you're referring to that Swift and Hannon have presented for a number of different taxa. That's the best information we have available.

That is how we applied it in the EIS.

And that provides us with confident impact predictions. Thank you.

THE FACILITATOR EHRLICH: Todd, do you have any further questions on the subject?

MR. TODD SLACK: I have one (1) more -- or just one (1) last point, and if the -- the proponent wanted to respond, I -- I -- sure. But when I read that paper -- now, listen, I am not a man with a great deal of letters behind my -- my name here, so there are a certain number of things that I, you know, did not understand. But when I looked at the -- that variety of taxa that you talked about, I grow very concerned when I see the mushrooms, when I see insects, when I see tropical birds being used as an analogy for, you know, the keystone species in the North, a species that's already under considerable pressure. And the First Nations har -- constitutionally protected harvesting rate already is at zero, essentially.

So, while I take your point that it's the best shot -- well, maybe I'm paraphrasing incorrectly, you know, there's a great deal of concern about this. And if we have to pursue it through IRs, then that's fine too.

MR. JOHN VIRGL: John Virgl, of Golder. Todd, I appreciate your concern. I appreciate everyone's concern about caribou. And just to correct, it's about the best information available. And ecological systems can be applied to other ecological systems, not specifically, but just because there are no threshold known for caribou right now doesn't mean we can't use a threshold from other species.

THE FACILITATOR EHRLICH: Okay. I'm going to jump in because I don't think we're getting much productive benefit of belabouring this one any further. The -- I think that De Beers has clearly heard the Yellowknives' concern over this approach, and I know that the Yellowknives have heard De Beers' response on this. The environmental impact review is still at an early stage, and then there are other opportunities for pursuing questions if necessary.

Todd, you -- you're holding up your pen and I don't know if it's just because you're holding it or because you have another question, but where are you at?

MR. TODD SLACK: I have two (2) more questions, but in the interest of time I could sacrifice one (1) of them, because it was just a confirmation.

But its -- it falls on that -- that 7 percent that -- that John ju -- was just talking about.

And again, this is not new. Golder has seen this in the -- the NICO process. But the cumulative effects analysis that Golder submitted with this is again lacking in thoroughness. It does not include a single project in Nunavut, which we all know that there's going to be projects in Nunavut.

Using that same list that was presented in the -- in the Fortune (phonetic) case, I -- I spoke to Elgin Mining at Geoscience who own Lupin and Ulu, and they state that their -- their project is a re -- reasonably foreseeable project as it's defined.

Xstrata spent $50 million on Hackett River. And I'm not an international mining executive, but I'm sure folks would agree that no international miner spends that kind of money unless there's a real project there.

Jericho's on the process of be -- being reopened. Bathurst's Porten Road has been in environmental assessment for a few years. And Sabina's deposit at Back Lake is very promising, as well.

So, this cumulative effects is done at 7 percent when I think that in reality that is not a conservative approach, because of the number of developments that are going to occur in much high -- much more important caribou habitat in Nunavut.

Relatively important. So, I would like to see the company redo this cumulative effects analysis that better reflects the upcoming future.

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. Todd, we appreciate your comm -- comments, but it is our opinion that the cumulative effects assessment in the EIS is a thorough -- and a document that we can very easily defend. And so it looks like we're just of varying opinions on this one. Thank you.

(BRIEF PAUSE)

THE FACILITATOR EHRLICH: It's a question for De Beers. We're just trying to figure out if this is good undertaking fodder, or IR fodder. Undertakings are the kinds of things that can probably be produced in a couple of weeks. And it sounds like, you know, there's an interest on the Yellowknives part to find out how your cumulative effects model would be changed, and how your predictions would be changed, with the inclusion of the projects that they've specified.

Is that something you think you can do within a couple of weeks?

(BRIEF PAUSE)

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. The short answer is no. It's not something we could undertake in a couple of weeks.

But, I think, more importantly, what we presented in the EIS for the cumulative assessment is what we believe is a -- reasonable foreseeable projects in the region. And we think we've adequately addressed this, and we feel that we're in a position to defend what we've already established in the EIS. Thanks.

THE FACILITATOR EHRLICH: I don't want to request an undertaking that can't be done in the time period that's suitable for undertakings. Would De Beers be willing to do an undertaking describing why it feels that the project's specified by the YKDFN are not reasonably foreseeable in that case? Because you said you've included those that are reasonably foreseeable. If the Yellowknives have said, There's other stuff you haven't, I'm assuming if you disagree, it's because you disagree about whether they're reasonably foreseeable.

I -- I think this would be a -- and I -- I -- I -- I don't want to leave the Yellowknives the only avenue here of putting this out in an Information Request, when there -- there may be a -- a more common ground than we see before us right now.

I propose this as an undertaking. We'll call it Undertaking Number 1, which is for De Beers to at least reconcile its cumulative effects assessment, with respect to reasonably foreseeable future developments with those that have just been described from the Yellowknives Dene, specifically pointing out where if you -- if you disagree with some of the assumptions that you've just heard, why.

That's not the same -- deliberately not the same as asking for a -- a full second cumulative effects assessment. Like I said, the process is -- is early rath -- at the moment we're at an early point in the process, and it's possible with that undertaking maybe it won't need to be pursued further. Are you able to do that by December 16th, which is a Friday? It happens to be two (2) weeks after the last day of this session.

MS. VERONICA CHISHOLM: Veronica Chisholm from De Beers. Thank you, Alan. Yes, absolutely, we could meet that timeline and we could provide that response by that date. Thank you.

--- UNDERTAKING NO. 1: De Beers to reconcile its cumulative effects

assessment, with respect to
reasonably foreseeable
future developments with
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if De Beers disagree with
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they just heard, and why
(Provide by December 16,
2011)

THE FACILITATOR EHRLICH: I'm also happy to take yes, absolutely as an answer.

Now, we've got -- we've got -- and Todd of the Yellowknives, would that help you -- help clarify perhaps where some of the divergences are between the Yellowknives and the developer?

MR. TODD SLACK: Todd Slack, YKDFN. Well, it remains to be seen what's written, but certainly it's not going to hurt. And if the company wanted to focus on those projects that are already in environmental assessment in Nunavut that are before the NIRB, that would be a recommendation I would make.

THE FACILITATOR EHRLICH: Well, just for the -- for the -- I mean, I -- I see the company has heard what you've just said, but you've also mentioned other things that the Yellowknives perceive -- see as being reasonably foreseeable, and I don't want to exclude those. I think it's -- you know, you've -- you've asked a question and the company deserves a chance to explain the -- the route it has taken.

That's our first real undertaking for this session, which is kind of remarkable, considering we're on day -- day 2 -- day 3 of the session. I would strongly suggest -- when you see the transcript, you'll see the undertakings listed up at the very front, don't just look at the undertaking listed at the very front. Search the undertaking in the document, try to look at the context of the discussion that came up around this, because if you want to resolve the stuff meaningfully, then it really helps to remember what -- you know, what kind of issues were being looked at and the discussion will keep you on track, and hopefully make sure that your efforts are efficient and -- and -- and pointed towards the -- the question at hand.

So, I say that with respect to all undertakings, but now we have an Undertaking number 1 then. It'll be on the tscript.com site tomorrow.

Now I'd like to ask the GNWT if you have -- they've indicated during the break they have one (1) or two (2) questions regarding caribou. Who's going to be asking those for the GNWT?

MS. LORETTA RANSOM: Good afternoon. It's Loretta Ransom with the Government of the Northwest Territories. I just have two (2), or one (1) question, really.

Today you guys confirmed that you'd be willing to work with Environment and Natural Resources towards monitoring harvesting activities along the winter road.

We would just like to confirm, or continue our discussions on that and we would like to work towards a commitment from De Beers to provide a base of operations for community monitors, officers and biologists to mon -- during the monitoring of the harvesting, such as a check station or access to project buildings for overnight stays and what not.

And I just wanted to bring that up, through -- from Bruno (phonetic). And just to raise it as -- for future discussions.

THE FACILITATOR EHRLICH: Is this something that De Beers requires further -- future discussion on, or are you willing and able to commit to something like that now?

(BRIEF PAUSE)

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. I was just consulting because I -- I'm relatively new to De Beers so I wasn't sure what the conversations were had.

We would like to continue that conversation. I don't think we're in a position today to make a full commitment but we -- definitely are in a commitment to keep the conversation going on this. Thank you.

THE FACILITATOR EHRLICH: Thanks. And I'll remind everyone of what I said yesterday regarding sidebar meetings. Parties are entirely free to hold them amongst themselves to sort out stuff. We have a form that you can report the results on if you want to be sure that they get on to the public record. And we'd encourage you to -- to use that format. Stephen Lines of De Beers has a copy of the form, I think.

Any other questions from the GNWT?

MS. LORETTA RANSOM: It's Loretta Ransom, GNWT. Thank you very much, and that's what we were hoping to hear is -- you know, continued discussions.

We also just wanted to acknowledge that a lot of work and effort has been put into modelling the model. And that we look forward to receiving the addendum and to further discussions after we receive that and have had time to review it. That's it.

THE FACILITATOR EHRLICH: De Beers, care to comment?

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. No, no further comment. But yes, absolutely. We'll be submitting that addendum and conversations will be continued and -- and MVEIRB will get a copy of any conversations that we have with -- with Loretta et al.

THE FACILITATOR EHRLICH: Smashing. Thank you. I have a question from Terry Antoniuk of Salmo Consulting, who's out of Calgary, who's consultant for the Board on cumulative effects.

It touches vaguely on -- well, not that vaguely on -- on the question that the Yellowknives asked a moment ago. He's participating as a remote participant.

He -- Terry says, quote:

"You've indicated that mineral exploration sites have been the

largest footprint on the landscape.
Did you consider future exploration
sites in your analysis? And if not,
why not?"

(BRIEF PAUSE)

MR. CAMERON STEVENS: Hi, Cam Stevens. Golder Associates. Terry, in the -- good question, Terry. In the EIS there is actually a figure -- I wish I could tell you that -- the exact figure number. But, it's a figure showing trends in development on the annual home range for caribou, and the number of camps on -- on the landscape and -- and the footprint on the landscape has actually declined since 2006.

The other point I want to make is that we have -- sorry, that's sever -- that's figure 7.5-3. So the number of camps on the -- on the landscape peaked in 2006 at around ninety-five (95) camps, and currently there are probably around fifty (50) to sixty (60) camps on the landscape.

So the other point I want to make is that for camps that have -- that are active, or camps that were active were -- were footprints with a permit for a five (5) year period, and we called those footprints active that entire five (5) year permit period, all year round, each year for five (5) years, when the reality is that companies are only on those locations for a couple months a year, maybe one (1) year out of five (5), but rarely for five (5) years, and rarely for the entire year.

So that -- that was one (1) way with -- in which we dealt with uncertainty, by making this very conservative assumption that the zone of influence of a mineral exploration permit was active for a five (5) -- was active for a five (5) year permit in our -- in our assessment.

THE FACILITATOR EHRLICH: Cam, can I just clarify. The question wasn't how have you been conservative in your dealings with past and present exploration developments. His question was, and I quote: Did you consider future exploration sites in your analysis, and if not, why not?

So the question is: Did you consider future sites in your analysis, and if not, why not?

MR. CAMERON STEVENS: Well, it's difficult to predict, first of all. The trend is -- is -- there's been a declining trend in the number of sites. And -- and because it's difficult to predict we -- we decided to make our assessment conservative in --

in other parts of that assessment to deal with that uncertainty.

THE FACILITATOR EHRLICH: So is -- is it fair to say then that you didn't include future stuff, but you made your consideration of present and past stuff conservative enough so you figured you got the net impact?

MR. CAMERON STEVENS: Cam Stevens, Golder Associates. The answer to that is yes.

THE FACILITATOR EHRLICH: Okay. Do we have any other questions on caribou? I see that Steve Ellis from Akaitcho Treaty 8 Tribal Corp has one (1).

Now I know that we're getting a little bit behind with the cari -- with the carnivore and species at risk and bird stuff, but caribou is a really important subject. There's a key line of inquiry. I want to give it the time that it -- it needs to be adequately dealt with in this session. If we have to go a little bit late with the carnivore stuff, we will. But this -- this seems to me like a place where people really need to get their -- their questions out.

Steve, if you're asking a question on behalf of Akaitcho Treaty 8 Tribal Corp, please make that clear. If you're asking on behalf of remote participants, because I know that you are actually many people here today, please make it clear who you're make -- asking the question for. Thank you.

MR. STEVE ELLIS: Yeah, it's Steve Ellis with the Treaty 8 Tribal Corporation. All these questions are on behalf of the Treaty 8 Tribal Corporation.

So I'm glad we're -- we're back to this concept of uncertainty, and conservative modelling because that's really where my question lies. It sort of follows up on where Alan started, this -- this questioning with regards to the caribou.

Can we go to slide 43? Yeah, you know, I guess a couple of hours ago at this point when Alan was asking some questions with regards to the rationale for conservative modelling, I think, you know, John, you gave a fairly good answer, saying that, Well, you know, we want to capture an uncertainty that we can't predict for, we can't define, so we are on the side of -- well, you know, it's just -- this is just simple common sense, right.

You make conservative estimates to capture that uncertainty. So I guess what I don't understand from this graph here, and what -- what I see in the -- the minus twelve point two (12.2) is from the EIS, and the -- the use of your -- correct me if I'm wrong -- your key assumption, 1 kilogram loss reduces parturition by zero point zero six (0.06) units, correct, and that's how you reached that twelve point two (12.2) number?

I'm seeing nodding over there, so I'll just proceed.

THE FACILITATOR EHRLICH: Hold -- hold on a second there, Steve.

MR. CAMERON STEVENS: Okay.

THE FACILITATOR EHRLICH: The sounds they're making don't sound like nodding.

MR. CAMERON STEVENS: Okay.

THE FACILITATOR EHRLICH: They sound the other, the opposite of nodding.

MR. CAMERON STEVENS: Well, would it -- would it -- sorry, Steve. Would it help if I went through this just quickly? No. So -- okay.

THE FACILITATOR EHRLICH: Please go ahead.

MR. CAMERON STEVENS: Okay.

THE FACILITATOR EHRLICH: That sounded like a "no." Steve, could --

MR. CAMERON STEVENS: All right.

THE FACILITATOR EHRLICH: Could you perhaps rephrase your question. I'm not --

MR. CAMERON STEVENS: It's -- it's --

THE FACILITATOR EHRLICH: I'm not sure they're quite ready to go. Or Cam, are you ready to respond?

MR. CAMERON STEVENS: Sorry. I guess the point -- the point I just want to make -- sorry. It's just an opportu --

THE FACILITATOR EHRLICH: Please state your name at the beginning of speaking.

MR. CAMERON STEVENS: Sorry. It's Cam Stevens.

THE FACILITATOR EHRLICH: Thank you.

MR. CAMERON STEVENS: Thank you, Alan. The -- the point is -- is it's just not parturition. We've -- in the model we've -- we've take into consideration habitat loss, but with some follow-up work, you're right, if we use a different relationship describing mass and parturition rate, if we use a relationship being used by some regional biologists the -- the effect size is much lower.

MR. STEVE ELLIS: I guess the question is then in making the transition from minus twelve point two (12.2) to the new number, minus three point se -- seven (3.7), what was the variable that was adjusted there? Is it -- is -- is the variable that was adjusted the habitat loss? I don't think so. I think the variable that was adjusted was something else. So what is that adjustment?

MR. CAMERON STEVENS: Cam Stevens, Golder Associates. That's a good question. What we did was -- so we know -- so we know -- we know what parturition rate is under -- under a good -- under, you know, perfect conditions. And then when we add 'X' number of developments onto the landscape and we calculate the number times caribou encounter those del -- those -- those zones of influence, we can -- we can model and -- and predict what the -- the possible -- the weigh -- weight loss will be.

And then from -- from that we -- we estimate what that partur -- drop in parturition rate is going to be. So we have a -- we have a parturition -- a fecundity rate. Essentially, it's -- it's a probability of a calf producing -- of a cow producing a calf the following spring, and we know that -- what -- what that value is.

Let's say it's one (1) under perfect conditions. So the probability of -- of a cow in a perfect world producing a calf is one (1), and it's reduced a certain number. And then we run that simulation. And then we -- and then we modify that vital -- and we call it a vital rate, and that vital rate is an input in a stage -- it's in the matrix. They call it the matrix in the population viability analysis.

So you -- you multi -- you -- you reduce that -- that fecundity rate. And then you rerun your simulation. And then that's the -- and then that's the effect. The difference between -- the difference between the outcomes from those two (2) models is your effect.

We've also reduced not only parturition rate, but habitat loss, as well. But in this case here, hab -- habitat loss is the same in both of those -- in both of those comparisons. It's -- it's the -- it's the reduction parturition rate that's -- that's being changed. And what this exercise tell -- tells us is that parturition rate -- a solid change in parturition rate has an effect on the outcome.

Does -- does that help? Does that answer your question? Thank you.

MR. STEVEN ELLIS: So just -- Steve Ellis here, Treaty 8 Tribal Corporation. So the minus twelve point two (12.2) actually has a higher parturition rate than the -- than the other one (1), than the three point seven (3.7)? Is that what we're saying?

MR. CAMERON STEVENS: The -- the difference is higher, so the par -- the change in parturition rate in the -- in the future model is -- is dif -- is more different than -- than the reference model. In the -- in the rerun the difference in parturition rate is less, and that's because of -- of the relationship described by -- by Daniel.

MR. STEVE ELLIS: Okay. Thanks. That's all I'll ask on this. I'm quickly going to get ov -- in over my head if I keep on going down this road, but this gives me enough information to direct our people who should know this sort of thing in the right way, so.

That's -- that's the first question. The second does have to do with zone of influence and how you've described it. So if you'd go to slide 39. Can we go there?

Just a clarification here. So at the very bottom it says the assumption is that -- or I guess based on some peer reviewed journal articles the understanding is that we can expect for every day of insect harassment we have a .15 kilogram decrease in weight.

And then above that it says for every

disturbance we can expect a .047 kilogram decrease in weight for a cow. What is a disturbance? Is that an incident where a caribou or an animal trespasses through a zone of influence, or encounters one, or please define that a little better?

MR. CAMERON STEVENS: Exactly. That's when a -- oh, Cam Stevens, Golder Associates. But that's exactly right. It's when a -- one (1) of those paths intersects the zone of influence and -- and then we -- we're assuming a very strong response.

So no matter where that path intersects, it might be right on the edge, we're still counting that as a -- as -- as a disturbance. And it's a strong repo -- response. The cow is very excited, excited for twelve (12) hours.

There's -- which has meta -- demands, and -- and the caribou runs for -- for -- for 2 kilometres. And so that was one (1) way we described -- or -- or quantified the number of disturbances.

The other way was -- was to quantify the days within the zone of influence, or the percentage of the animal's time inside the zone of influence. And so we assumed, correct me if I'm wrong, John, that -- that -- that for each day in the zone of influence that the animal was exposed to one (1) strong response to -- to a -- something that was going on around the mine site, or around the -- the community, or around the mineral exploration camp, or around the winter road.

MR. STEVE ELLIS: I guess just a -- just a -- Steve Ellis with the Treaty 8 Tribal Corporation. Just to clarify for my own mind here, so just looking at the little graphic there, so we've got the green 'X' where caribou enters in and the purple 'X' where they -- where they exit.

So if a car -- say let's get -- say caribou A walks in there and spends thirty (30) days in there, in close proximity to the actual project works and then exits, and yet caribou B comes in and -- and moves through that zone of influence within twelve (12) hours to the extremity, are they both counted at the same disturbance, one (1) disturbance?

MR. CAMERON STEVENS: Cam Stevens here, Golder Associates. The short answer is yes. It's -- if -- if -- if it -- time -- the amount of time the animal spends inside the zone, put that inform -- put that information aside.

We've done it two (2) ways. So we've counted the number of times the path intersects, no matter how slow or fast the animal is going, or where -- where it intersects. An intersection is an intersection and that's -- and that's -- and we -- we call that an encounter, or a potential encounter.

And then we -- and we just -- just -- you know, we just measured another -- another parameter, you know, to see -- just to make sure -- you know, we're -- we're understanding what's going on.

We wanted to quantify the number of days on average that the animal spent close to zones of influence. That number actually turns out to be, I think, six (6) -- six point nine (6.9) days. Six (6) poi -- so on average female cows as they mar -- as they move from the calving to the wintering areas spent six point nine (6.9) days in close proximity to -- to human developments.

THE FACILITATOR EHRLICH: Cam, I'm going to just jump in here, and, Steve. We're getting to a level of detail that I would say certainly exceeds the sort of broad outlook that we're striving for with the EIS analysis session.

I mean, I hope that the discussion on that has -- has got to a point where it's -- it's useful. Stuff like that in our technical sessions or -- or during IRs can be time well spent, but I -- I don't want to dig into too much more depth than that.

Steve, do you have other questions, or -

- or anything that you want to respond to the stuff you've just heard without -- without continuing further down the rabbit hole?

MR. STEVE ELLIS: Yeah. No. No, thanks a lot, Allan. I understand your concern, but I think the -- the concern from our end -- Steve Ellis here with the Tribal -- Tribal Corporation -- is that we have very limited funds. We can't hire consultants to read the entire caribou section here. We have to focus their efforts.

So my job here this week is to hone in on where they should be focussing their time. So it's -- it's important from my perspective that we were able to ask these questions so that I can spend ten thousand dollars ($10,000) on someone as opposed to forty (40).

THE FACILITATOR EHRLICH: Sure, and the panel is all about using resources efficiently for the -- the sake of this. If you have a couple of more detailed questions you can always give them to De Beers as some overnight homework.

They might be able to provide you with, you know, more substantive answers in -- in the morning if -- if you feel that the time we have available is one (1) of the limiting factors. Just let us know before the end of the session today if that's the case, so that De Beers has a chance to understand what information would be helpful.

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. I just wanted to make the offer that certainly De Beers would be delighted to sit down with you, Steven, and -- and whoever your experts are, and go through the caribou and/or any parts of the wildlife section, if you would find that helpful.

MR. STEVE ELLIS: Yeah. Maybe what -- some way we can save time is essentially we can meet on the side. I think it's important to get things on the record, but we can save a lot of this dialogue here by having it on the side then tomorrow, enter it in, into the record, and we know what the response is already, but just to know that it's there.

But, yeah, I don't want to bore everybody. I'm boring myself, frankly, but -- and that's pretty hard to do. But, yeah. So maybe my next question, which is again a somewhat technical one, I'll just talk to you guys on the side on this one. Sound good?

THE FACILITATOR EHRLICH: And I mean, I think your point of -- of getting it captured on -- the outcome of those discussions on the record is -- is a valuable one. Please remember that when you do have those discussions, even if you just give us a verbal response tomorrow, that -- that'll do the job. I mean, it's extremely likely there will be some wildlife stuff going on tomorrow, looking at what we have left to do and what time it is.

De Beers, are you able to have your wildlife people around tomorrow so that if some of the carnivore stuff needs to be picked up in the morning and some more of this caribou stuff is going on, you've -- you've got the people here who can do it or do you want to go later today?

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. Just allow me some time to consult with my consultants.

THE FACILITATOR EHRLICH: You bet. I'm -- meanwhile, I'm going to ask any of the other parties who are here, do you have any more caribou questions, or are you good to go on to the carnivores, species at risk and birds?

I don't see any hands going up about caribou. So that's -- that's probably it for the caribou questions we've got now. It's 4:00. We've got another hour. We have a good shot of getting through much of it, but there might be a few questions left. I'd like to try to do it today.

In the eventuality, as I mentioned, that we run out of time, what's De Beers' preferred take on it?

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. We'd like to carry on and see if we can sort of plow through it this evening. Thank you.

THE FACILITATOR EHRLICH: Okay. And it might not take that much plowing. We are ready to move on to the next presentation. So for our remote listeners, we are on a file, which is on the Review Board website, described as day 3, air quality and terrestrial.

And I believe it's slide number 51. Let's see if the numbering is the same here. Can you go back one (1) slide, please? It's right after the -- the cover slide with the pretty picture of the fire weed that is labelled Gahcho Kue Project Subject -- SON, subject of note, Carnivore Mortality, Section 11.10. That's -- that's exactly where we're at.

And who's going to be presenting on behalf of De Beers?

MR. CAMERON STEVENS: That would be -- Cam Stevens, Golder Associates. That would be me, Alan.

THE FACILITATOR EHRLICH: Okay. Please go ahead and please keep doing an excellent job of reminding people where you're at.

PRESENTATION BY DE BEERS RE CARNIVORES, OTHER UNGULATES, SPECIES AT RISK:

MR. CAMERON STEVENS: Okay. So this -- this section included the valued components: grizzly bear, wolverine and wolf.

And as before, I'm going to go over some of the terms or directions that were provided in the terms of reference. This sort of -- this sets -- essentially sets the stage for the assessment and -- and why we did things the way we did.

In Section 5.2.3 of the terms of reference, it is stated that:

"The EIS must assess the experiences with carnivore mortal -- mortality and related mitigation measures at existing mines; provide improvements over the mitigation measures applied at existing mines; assess the differences in impact predictions resulting from the pro -- proposed development's proximity to the tree line. In the cumulative effects context, for species with large home ranges, the EIS must evaluate impacts in consideration of the full range used by each species."

And we addressed this by using the Slave Geological Province, with -- as -- as discussed earlier in today's presentation.

The next slide, slide 52. Specific information needs that were identified include potential attraction of carnivores to attract -- to attractants such as garbage and the creation of habitat in the camp.

Development components that may cause a sensory disturbance and affects the movements. This was captured by applying zones of influence as discussed earlier.

Effects of hunting access from linear development -- development components, such as the ice road. We just had a similar discussion on this topic at the end of the caribou presentation.

Effect of habitat loss. Here we define effective habitat as preferred habitat as defined by a resource selection function.

And then measures that may be taken to

avoid or ruse -- reduce these impacts. Some of these were discussed earlier during, I think it was, the third or fourth slide of -- of the -- the presentation for -- for the terrestrial environment. There's more information in appendix 7.1, and there's more information in the section for carnivore mortality.

The next few slides I'm going to -- I'm going to quickly go over some of the baseline surveys and data that have been collected over the number of years.

The grizzly bear study design was -- was similar to methods used at other diamond mines, first of all. For example, there have been a number of searches, or -- or surveys for grizzly bear sign at -- at locations in preferred habitat types across the RSA.

And this figure in the top right-hand corner of the slide illustrates some of the locations where bear sign has been looked for. Eskers have been surveyed during multiple years, going back as far as 1998 through to 2007. We know of four (4) active grizzly bear dens in the area, the nearest one being about 8 kilometres west of the camp. There's been no record of black bears in -- in the -- in the year -- in the RSA.

Golder and De Beers are currently in --

in -- are currently involved in a unique novel pilot program, a hair snagging program that was initiated in 2010, and we're -- we're currently testing to see whether or not this is a viable method for -- for monitoring grizzly bears in the RSA.

And this program has benefited greatly by local knowledge, and traditional knowledge, of -- of -- and guidance from -- from Pete Enzoe, from the community of Lutsel K'e. But it's -- this is a picture of myself and Pete this past summer.

Here we have -- this is an example of one (1) of our posts, and below these posts we have -- we have scent lure, and the scent attracts grizzly bears to these locations, and leave hair behind here that we used it to identify individuals from DNA analysis. We have forty (40) of these locations scattered across the RSA.

There were two (2) separate types of surveys or two (2) programs for wolverine. There's been snow tracking and hair snagging.

Hair snagging was initiated in 2005 and 2006, and for that program we had a hundred and seventy-five (175) posts distributed across an area of sixteen (16) -- 1,600 kilometres squared, and that worked identified seventeen (17) individual animals in

2005 and 2006.

In 2010 and 2011 we -- we've done snow track surveys over multiple years: 2004, 2005, 2010, 2011. The current study design for snow tracking includes forty (40) equal-length 1-kilometre transects randomly stratified across the RSA. And these surveys are completed by two (2) people on snowmobile positioned -- running parallel about ten (10) -- ten (10) or so metres apart from one another moving at very slow speeds, looking for tracks. And the picture on the right is -- is your -- is your -- is a picture of a wolverine track.

Since 1999 there have been four (4) dens located in the RSA, and the nearest one is about 16 kilometres from camp.

(BRIEF PAUSE)

MR. CAMERON STEVENS: Pete Enzoe again has been -- he -- he's been an integral part of the snow tracking program. And I'm not too sure if this is -- is a photograph of Pete in the bottom right-hand corner, but it might be.

The assessment. So for -- for grizzly bear and wolverine the key issue has been mine-related mortality and not necessarily habitat as both species connect with habitat generalists on the landscape.

In an -- so in -- and further, an examination of long-term data for multiple mines in the re -- region, fifty-four (54) mine years, in fact, revealed that previous mining activities have led to mortalities at -- at mines in the region. There have been four (4) historical grizzly bear deaths we -- that we -- that we know of from this period, 1996 to 2009. In other words, the risk of mortality for the project may be point zero seven (.07) bears per year. The risk for wolves is even lower. There have been only three (3) reported mortalities in the region.

The risk of mortality for wolverine is slightly higher. There have been eleven (11) historical wolverine deaths from this period, 1996 through 2009, which translates to a mortality rate for the project of approximately zero point two (0.2) wolverine per year.

However, we -- we contend that these predictions are -- are conservative. Mortality rates in the future should be lower given that the project, the Gahcho Kue project mine, will adopt and use proven waste management practices similar to that being used at the Snap Lake mine where there is a good record for minimizing and -- and reducing mine-related incidents and mortalities.

Another important point to make is that the -- the Gahcho Kue project mine is at the -- it's just outside the core area for grizzly bear populations. So there are not a lot -- there are not -- there isn't -- there isn't a high density of -- of grizzly bears in the region compared to regions further to the north.

So preferred habitats for grizzly bear, wolverine, and wolf were assessed the same way as done for caribou. This is slide number 56, sorry. We began first by mapping habitat, and we used -- we mapped habitat using Chris Johnson's resource selection function. We assigned ranks and scores to areas on the map. And they we overlay the footprints in the zover -- zones of influence, and then summarize cells per scenario.

And again, we -- we looked -- in -- in this table here we -- we had a 2010 baseline scenario. We had a 2010 baseline, plus a project, the application scenario, and we had a future scenario. And we also had a reference scenario. So here there were four (4) scenarios. Again, preferred habitat equals good and habitat -- good and high quality habitat combined. And this table is -- is very similar to the one (1) you'd see in the EIS.

So the first point is that incremental decreases from indirect and direct changes to preferred habitat will be very small. They'll be neg -- negligible, less than 1 percent. And that cumulative decreases to preferred habitat will be moderate in magnitude, approximately 12.4 percent. And that 12.4 percent is the sum of these two (2) numbers in the far right column, minus seven point three one (7.31) and minus five point zero nine (5.09). Again, as for caribou, the majority of losses on the landscape, al -- although not illustrated in this table, occurred prior to 2006.

Important pa -- another point I want to make for grizzly bear habitat is that this assessment was done for multiple seasons and the effect was largest for spring habitat. The effects were smaller for -- for summer habitats and fall habitats.

This is -- it's an observation of a grizzly bear on -- near Kennady Lake. This photo was taken in 2008. There have been much fewer observations such as this since 2008.

Wolverine habitat. Conclusions for the wolverine assessment -- this is slide 58. Conclusions for the wolverine assessment include incremental decreases from indirect and direct changes to preferred habitat will be low, 1.5 percent. Cumulative decreases to preferred habitat will be moderate in magnitude. Largest changes were observed for the winter season, an 18.8 percent change, and this was largely from the Tibbit-Contwoyto winter road. About 10 percent of that 18.8 percent change was driven by the -- the zone of influence associated with the Tibbit-to-Contwoyto road.

So effect sizes for wolverine are much smaller during the summer and for most of the winter, right, because the Tibbit-Contwoyto road is only open for about two (2) months of -- of -- of the season.

So this number, 1.5 percent is taken from the -- the grey column, the minus -- it's the addition of minus point three eight (.38) and minus one point zero eight (1.08). Similarly the 18.8 percent change re -- reported for cumulative decreases is taken from the -- the brown or orange column in the sum of minus ten point four two (10.42) and minus eight point three nine (8.39). A very similar table is -- can be found in -- in the -- in the -- the EIS.

For wolf, changes to population persistence was primarily measured as -- as changes to preferred habitat. And part of the reason was that there have been very few incidents -- wolf incidents at -- at mines over the past decade or so. The conclusions for the wolf assessment include incremental decreases from indirect and direct changes to preferred habitat will be negligible, less than 1 percent.

That number again is taken from the table, the sum of these two (2) numbers, high and good -- high and good habitat quality combined. And the cumulative decreases to preferred habitat will be moderate in magnitude, approximately 10.4 percent. The sum of minus five point five nine (5.59) and -- and minus five point four seven (5.47) in the orange brown coloured column in the table.

That summarizes all I want to say for -- all we want to say for carnivore mortality today. We can take some questions, or John can -- I think John would like to take over and maybe talk about moose and musk ox.

THE FACILITATOR EHRLICH: If it's all right with De Beers, I'd like to keep on going with the presentation and we'll save the questions until later on. Thank you.

MR. JOHN VIRGL: John Virgl here. I'm going to present the information on other ungulates, which includes moose and muskox and species at risk in birds, which includes species at risk and upland birds, waterfowl, and raptors.

For other ungulates -- oops, sorry, 61 -- slide 61. For other ungulates the terms of reference stated that the EIS must assess the frequency of moose and musk ox in using the study area, project components that might cause sensory disturbances, effects from potential changes to predator-prey relationships, and include measures to reduce impacts. Baseline information for moose and musk ox was primarily collected from caribou surveys and other ground field observations and -- and -- and baseline surveys in the -- in the regional study area from 1995 to 2005, and also in 2007, and more recently in 2010 and 2011.

For example, caribou surveys in 2004/2005 recorded fifteen (15) groups of musk ox. These groups consisted of one (1) to ninety-two (92) individuals per group. In contrast, there has been relatively few moose recorded in the study area. For example, fourteen (14) from 19 -- fourteen (14) moose were -- were recorded from 1995 to 2005. This is likely associated with the -- the low quality of moose habitat in the regional study area. There is very little tall shrub and birch seed habitat types.

Slide 63, the -- the slide starts off

with our -- our -- our conclusions from the analysis, and that the incremental and cumulative losses of good and high quality habitats for moose and musk ox and -- were low in magnitude.

Changes in sensory disturbance are predicted to be within 5 kilometres of the project footprint. This comes from our -- the noise modelling that predicts that during continuous operations, noise will reach background levels within 3.5 kilometres and of -- of the mine site, and that noise will reach background levels within 3 kilometres of -- of the winter road.

The -- the EIS focussed on changes in habitat for moose and musk oxen. The approach is similar for other wildlife value components, in that we applied habitat suitability indices that were derived from the scientific literature and included specific zones of influence for moose and musk ox.

For moose, the model was based on the summer. And this is largely due -- because during the winter -- winter, moose move into the forest to find food and shelter. But for musk oxen, we developed a winter model and this was intended to capture the -- the effects of the winter access road along with the other developments in the regional study area. And this provided the most conservative approach by maximizing the -- the effects that -- that would be assessed.

This slide here shows -- you've already seen this. This is what Cam showed earlier and we spent a lot of time on this. So I don't want to spend any more time on this. I just want to highlight that the incremental change from the project was about a 1 per -- 1 percent change in -- in high quality habitat for -- for -- for musk oxen. And that cumulatively, from past, previous, and reasonably foreseeable developments, including the project year, there was a 7.9 decrease in high quality habitat for musk oxen.

Oh, I should say, in contrast for moose, the -- the changes were much less than 1 percent for the project and about 2.9 percent for the cumulative losses of habitat.

Species at risk in birds. The terms of reference state that the analysis must be of sufficient detail to allow the panel to discharge its responsibilities under the Species at Risk Act. And species at risk include all species under the scheduling of the Species at Risk Act, those species listed by COSEWIC, and those species listed by the GNWT as may be at risk, at risk or sensitive.

It also asks that all potential disturbances during nesting, rearing, molting, staging, and migration be described. The potential for increased predation facilitated by development, identification of all contaminant exposure routes and possible changes in contaminant levels. And I should mention this is -- this is in the actual -- this is where the ecological risk assessment did its job. So this information was -- that's where the assessment was done for that particular pathway. And finally, identification of all potential alterations to bird habitat.

Six (6) species at risk have been observed in the regional study area. And they include: the grizzly bear, wolverine, peregrine falcon, short-eared owl, rusty blackbird, and horned grebe. All these species are listed by COSEWIC as special concern and the short-eared owl is a Schedule 3 under SARA and rusty blackbird is a Schedule 1 under the Species at Risk Act. For the NWT status, all species except for rusty blackbird are either sensitive or secure.

Baseline studies for -- for birds was completed using separate, different surveys. Oh, slide number. Sorry -- 69. The -- for upland birds, the -- the surveys were done using 25-hectare plots surveyed in 2004 and 2005, and the entire plot is surveyed here. And this provide estimates of species richness, or the number of unique species in the regional study area, and also the abundance of individual species, or the densities.

Twenty-eight (28) species of songbird, shore bird, and ptarmigan were detected. For waterfowl, or water birds, in -- in the spring, summer, and fall of 2004, surveys were completed along the lake perimeters from helicopter in the local study area. And in 2010 and 2011, surveys have been completed around the perimeter of Kennady Lake, and a control lake, called Lake X-6, in -- in the spring of 2010 and 2011. And altogether, twenty-two (22) species have been observed in the -- in the local study area.

For raptors, nests in highly subitat -- suitable habitat were -- or highly suitable nesting habitat were identified and surveyed opportunistically for nesting activity from 1998 to 2005. Surveys focussed on potential nest sites in the local study area.

In 2004, intensive surveys of suitable nesting habitat were completed in the regional study area in June, and nests were checked for occupancy eggs and young. From these surveys, four (4) gyrfalcon, eleven (11) peregrine falcon nests were identified in the regional study area. And additional species observed included short-eared owl, northern harrier, rough-legged hawk, golden eagle, and bald eagle.

In 2010 and 2011, thirty (30) known nest sites were surveyed for occupancy and success, using the same protocols as at the Snap Lake, Diavik, and Ekati diamond mines. Slide 70 is a picture of a raptor nesting near -- or sorry, a peregrine falcon nesting near Margaret Lake in the regional study area.

So the analysis focussed on -- on habitat assessment as in other wildlife value components, and relative to the 2010 baseline direct and indirect changes from the project are expected to reduce the amount of suitable habitat for birds in the RSA by less than 1 percent. Cumulative changes from all past, previous, from all previous existing, and reasonably foreseeable developments, including the project, amount to less than 2.6 percent decrease from reference conditions.

Habitat modelling was -- was used for all three (3) of these bird groups. And for upland birds, the analysis in changes in habitat quality was directly related to changes in abundance. And abundance for reference conditions was based on the area of upland and vegetation communities, and the baseline density assess -- estimates taken during the baseline studies.

The -- the results basically showed that the incremental effects from the project were about 0.5 percent loss of -- of suitable habitat for upland birds, and there was a 2.6 percent loss from the cumulative changes. That's -- those numbers aren't on the slides. I -- the -- those are the numbers.

In addition, we developed a resource selection func -- or sorry, the -- the habitat -- there was a habitat suitability index model developed for water birds, and I'll go into that in the next slide, and also a reasonable -- or resource selection function for raptor nesting habitat, also using existing baseline data. Again, we've applied disturbance coefficients in zones of influences to the active developments to assess the changes in habitat quality.

Slide 72. So for water birds, the -- the habitat model was based on the presence of open water and the quality of nesting habitat within 100 metres of water bodies.

In all habitats within 1 kilometre of a zone of influence were reduced to low quality. The incremental changes from the project were less than 1 percent, and the cumulative changes from all existing and pre -- and previous existing and -- and future developments, including the project, was 1.4 percent relative to reference conditions. This included the combined amounts of high and good quality habitat.

For raptors, the reason the -- the resource selection function was based on twenty-five (25) known nest sites in -- in 2010, and then two hundred and fifty (250) available sites distributed randomly within the regional study area. And the -- the RSF basically said that areas of high slope and elevation, such as cliffs, were uncommon in the RSA.

Incremental changes from the -- the analysis showed that the -- the project is expected to disturb less than 1 percent of the -- of the high and good quality habitat, and that all projects in the cumulative case are expected to disturb about 1.6 percent of the high and good quality habitats.

This is just a slide, slide 74, showing the -- the resource selection function for the application case. So this includes the project and the previous and existing developments in the regional study area. Best habitats, as I mentioned, were cliffs. And these -- these -- as you can see, the green area is really the -- the high -- high quality areas and -- and all of these areas are really west of the -- of the project.

This just shows all of the current nest sites that we have until 2010 in the regional study area. And you can see, if you remember back to the previous slide, 74 here, where the green is, and slide 75, where the nests are, they're very highly correlated. The -- one (1) of the key points here so -- is that the -- all the nests are greater than 18 kilometres from the -- from the Gahcho Kue project.

So to summarize the terrestrial assessment -- oh, slide, there's no number on that slide, 76. Thank you. The EIS used multiple approaches and spatial scales to analyze the incremental and cumulative effects on vegetation, caribou, carnivores, other ungulates, upland birds, water birds, and raptors.

The assessment approach and methods were appropriate for meeting the terms of reference and provided confident and ecologically relevant impact predictions. The weight of evidence from all the analyses indicates that the incremental and cumulative effects from the project and other developments will not have a significant adverse influence on the abundance, distribution, and persistence of caribou, other ungulates, carnivores, and bird species.

And this should not have a significant influence on the continued opportunities for nontraditional and traditional land users to use those resources. Thank you.

QUESTION PERIOD:

THE FACILITATOR EHRLICH: Thanks for that, John. And thank you for that, Cam. Does anyone have any questions for De Beers on the other ungulate material that they've presented on the species at risk material or on the bird material that they've just presented? Please start with your name and organization. And then go ahead with your question.

MR. JAMES HODSON: It's James Hodson, with the Canadian Wildlife Service of Environment Canada. I just thought about a question about the ecological risk assessment for birds. I'm just wondering if you can point me to where that information is provided. Because I know in the -- in the section on birds it refers to it, but there's actually no details provided in that section, and there's no reference to where it can be found.

(BRIEF PAUSE)

MS. VERONICA CHISHOLM: Veronica Chisholm from De Beers. I appreciate your patience. I was just trying to get some background information. So we have compiled -- we are -- we collected some additional information and we're compiling that information and we expect to submit the ecological risk assessment in 2012.

(BRIEF PAUSE)

MR. JAMES HODSON: James Hodson with Canadian Wildlife Service. Will that be before the first round of Information Requests, or after? How does that fit in there?

MS. VERONICA CHISHOLM: I might have to get back to you on that one. I'm not sure of the exact timeline, but I do promise to provide you with a response.

THE FACILITATOR EHRLICH: It's Alan for the panel here. Can you do that tomorrow morning?

MS. VERONICA CHISHOLM: Veronica Chisholm from De Beers. Absolutely I can provide that tomorrow morning.

THE FACILITATOR EHRLICH: Thank you. Jamie, do you have -- do you have another question?

MR. JAMES HODSON: Yeah. It's James with the Canadian Wildlife Service again. Just about the content of the risk assessment, it wasn't clear to me whether it was looking at the use of the water management ponds and collection ponds during the operation phase in a closure -- or construction and operations. The way it's written it seems to be focussed on limiting discharges to downstream, but it doesn't discuss very much use of the water bodies within the mine and water control area during the project.

MS. VERONICA CHISHOLM: Veronica Chisholm from De Beers. It's my understanding that it will include those water bodies during operations. And that will be included, so.

THE FACILITATOR EHRLICH: Okay. James is indicating that that's -- that's all for his questions on these -- do any -- any other parties have questions on the subject matter that's just been presented?

(BRIEF PAUSE)

THE FACILITATOR EHRLICH: I see that the GNWT has a -- two (2) questions. We'll recognize

Gavin More.

MR. GAVIN MORE: Gavin More, GNWT. It's probably more of a comment. Whenever I see your slide that says habitat loss, I keep thinking that's -- that's almost a misrepresentation of what you're trying to get across.

If I turn something into a road, that's habitat loss. Reduction of use of an area is -- I always used the word "habitat effectiveness." And I think it takes people back, because I think they see the habitat no longer being there. And what you're getting across, I think, is that there's just not as much use of it necessarily.

And so I wonder if -- if -- if you could think of another word to better represent what you're trying to get across other than loss. It just does not seem to be the right word. Thank you.

MR. JOHN VIRGL: Thank you, Gavin. I appreciate that. In the past in -- as an EA practitioner we've used things that don't talk about loss and got in trouble for it there, so it's kind of -- but thank you for that.

THE FACILITATOR EHRLICH: Now I've got some questions from the Board's consultants who have been participating remotely. The first one that I will give is from Dr. Petr Comers, who's participating out of Calgary.

He points out that he doesn't see how the impact of access roads have been adequately considered, and he's wondering what is the evidence that access roads during winter do not present any impact on wildlife?

(BRIEF PAUSE)

MR. CAMERON STEVENS: Cam Stevens, Golder Associates. Hi, Peter. Good question. Some of this material was discussed on slide 46 and 47. And yes, again this pass -- this pathway was considered minor for caribou and minor for grizzly bears and wolverine because of these considerations.

First of all, access to the winter road is -- -- is gen -- is limited to only eight (8) to twelve (12) weeks per year. The harvest is regulated. De Beers' staff will be prohibited from hunting while on site.

Some additional considerations and -- and there is -- there is minimal harve -- minimal evidence of -- of -- of harvest. On slide 47, we have stated there's no evidence of harvest along Snap Lake -

- along the Snap Lake winter road, but -- but today we -- we've learned that there is some -- there is some harvest from -- from Peter.

THE FACILITATOR EHRLICH: Sorry. By Peter, I think you mean Fred Sangris.

MR. CAMERON STEVENS: Was it Fred?

THE FACILITATOR EHRLICH: Of the Yellowknives Dene First Nations who -- who referred to...

MR. CAMERON STEVENS: Okay, sorry. My apologies. Pet -- Petr -- seemed like a long time ago.

THE FACILITATOR EHRLICH: Yeah. Petr Comers is the -- is the consultant to the Panel who --

MR. CAMERON STEVENS: Oh, right. Okay.

THE FACILITATOR EHRLICH: -- I'm -- I'm raising questions on behalf of right now.

MR. CAMERON STEVENS: Thank you, Alan. So the winter access road project is at kilometre 271, and it's 43 kilometres further than the winter road to Snap Lake. And so based on that logic, we would expect very -- very -- very minimal -- minimal harvest along the -- -- the Ga -- the Gahcho Kue winter access road.

And we addressed -- we further addressed this issue in -- in our addendum too, that has been submitted to GNWT and ENR. And that will be made public soon -- very soon, I believe.

THE FACILITATOR EHRLICH: Veronica, you look like you have something to add. Am I misreading you?

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. Yes, you're misreading me.

THE FACILITATOR EHRLICH: Hopefully I won't be doing that again. The next question that we have from Dr. Comers is:

"What is the evidence that access roads during winter do not change predator movement and predation success?"

(BRIEF PAUSE)

MR. DAMIAN PANAYI: It's Damian Panayi with Golder Associates and I'll take an attempt at answering that question.

We don't have any real information on how carnivores interact with winter roads when they're going about what carnivores do. But we can say that a winter road in a bor -- in a tundra environment, as we have at Gahcho Kue, is very different from a winter road in a boreal environment.

And there is clear evidence that wolves will use winter roads or cut lines in boreal environments and are able to move faster down those features. But in this tundra environment, a winter road is just an area where the snow has been kind of levelled down and -- and hardened and -- and there's a bit of a snow berm on the side of that.

So it -- it really doesn't create the same effect on the landscape that a -- a winter road in a boreal environment does. So it's -- it's not something which -- which was considered in much -- in much detail in this -- in this document.

THE FACILITATOR EHRLICH: Okay. Thanks for that Damian. Petr, if you have any follow up questions, I'd advise you to email them now because our session won't be lasting for all that much longer.

I have a question from Terry Antoniuk of Salmo, who is participating from Calgary. Terry has asked:

"Did you look at carnivore mortality at exploration sites? If so, how did it compare to mine sites?"

(BRIEF PAUSE)

MR. DAMIAN PANAYI: This is Damian Panayi. I'll re -- take another resp -- shot at responding to these questions.

And the question was, if I understood, it's what information is available on -- on how carnivore mortalities at exploration camps has been incorporated into the environmental effects assessment.

And unfortunately, that information is collected by the Government of the Northwest Territories, and it's generally not made available to us in any real detail as to what -- you know, when grizzly bears or wolverine are -- are put down at exploration camps.

Usually the location and the date and that sort of information is not -- is not generally available. So we -- we weren't able to include it at that level. However, all of our modelling does include what information we know on the general harvest and mortality rates of those -- of those two (2) species.

THE FACILITATOR EHRLICH: Okay. Thanks for that, Damian. Another question that I have is: When you were describing on slide 68 where various species are listed, I was wondering when -- when species were categorized on this slide.

In other words, what year was that

information put together? In other words, when you were defining the COSEWIC status, and the SARA status, for each of these species, was this a couple of years ago, or -- or this year?

MR. JOHN VIRGL: John -- John Virgl, Golder Associates. That would have been for 2010 when the EIS was -- just before it was submitted.

THE FACILITATOR EHRLICH: I can't remember exactly when the horned grebe status was changed in SARA, but I believe it has happened since the time that this terms of reference was issued and the current date happened -- this turned out to be something relevant in a different environmental assessment we were working on.

And I -- does that have any bearing for your predications on it? Probably not. Does it have any bearing for the Panel's responsibilities with respect to the species? Entirely possibly.

So it -- it's -- could you please have a -- a look at the status of the horned grebe with respect to SARA, and tomorrow morning clarify if you still believe that it is not on any SARA schedule?

(BRIEF PAUSE)

MS. VERONICA CHISHOLM: Veronica Chisholm from De Beers. Yes, we will -- we will check on that, and provide a response tomorrow.

THE FACILITATOR EHRLICH: Thank you for that.

(BRIEF PAUSE)

THE FACILITATOR EHRLICH: Okay. And -- and Petr thanks you for your earlier response to his questions. He's still got some other outstanding questions, but he's prepared to wait for the addendum before he -- he pursues them any further. So it looks like there's something to this remote participation thing.

(BRIEF PAUSE)

THE FACILITATOR EHRLICH: I have one (1) more question from -- from Petr, but I -- I have a question of my own I'd like to ask first. Can you go back to slide 64, please?

(BRIEF PAUSE)

THE FACILITATOR EHRLICH: Thanks.

You're talking about incremental loss and cumulative loss as a percentage. It looks to me like it's a percentage of the regional study area. I was trying to ask earlier on in Cam's presentation before lunch whether or not that was about the percentage of the range of the caribou or of the regional study area.

The regional study area is something that the developer has been able to define, so the percentage that a -- a given loss has is partly an artifact of the size of the regional study area that was selected.

Now I appreciate you don't want to make your regional study area too small because you're going to miss stuff that matters. I get it.

But it makes it hard to interpret the one point one (1.1) and the seven point nine (7.9) when they're artifacts of your regional study area being 5,000 and change square kilometres. In other words, if you halved your study area you'd double those numbers. If you qual -- if you divided that in half again, you quadruple those numbers.

So for -- for stuff like this, absolute values can be more useful because they -- they don't change depending on the size of something that is entirely within the developer's control. In other words, there's an objective aspect to them that can be quite helpful to parties.

For the stuff that was important enough for you to put into these presentations, sure would appreciate it if you could give us something in writing that looks at the actual amount of space affected.

And, you know, this -- I don't know if this -- I wouldn't say this has to happen during the -- this session. If you're ambitious and you want to get it on there, fine. I would certainly be very comfortable calling it Undertaking number 2 if you're okay with that and -- and getting it by December 16th.

I mean, your general ideas I think have been conveyed effectively to everyone on the room. So people understand roughly where you're going with your predictions I think this will help parties throughout the remainder of the environmental impact review.

How does De Beers prefer to deal with that?

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. Alan, I'm just trying to understand the request. So are you asking if De Beers can provide you with the hectares area, square kilometres, for just the figures presented here today?

THE FACILITATOR EHRLICH: Yeah, I'm not

suggesting you go through the whole EIS and -- and do it again. I figure the most important stuff you've probably put in your presentations, and so I just don't want to burden you with stuff that isn't as likely to be important to parties. But if you put it in your conclusions that you've presented here today I think it matters enough so that you figured parties would want to understand it, and I think this will help parties understand.

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. Yeah, all of the numbers that are presented in this presentation in terms of the aerial extent, hectares, square kilometres are presented in the EIS. And I believe that we will be able to provide those numbers probably not by tomorrow, but maybe it would be best as an undertaking.

THE FACILITATOR EHRLICH: Hold -- not so fast there, De Beers. I'm just taking a second talk with our colleagues because I don't want to propose an undertaking that wouldn't wind up adding actual value. I don't want to just make extra work for you if it's not going to help anyone.

What I've just heard you say is the actual numbers for each of these are inside the EIS anyway, and you've referred in each presentation to which part of the EIS this stuff can be found in.

And so let me just talk to my colleagues here for a second and try to think this through. Thanks.

(BRIEF PAUSE)

THE FACILITATOR EHRLICH: Here's a question for De Beers: Is it easy to find in the EIS? The fact that the De Beers team that wrote the EIS is looking for it right now and has been for a little while makes me think that it's not -- I know it's a large document. It was written a while ago, but -- I'll ask De Beers to comment.

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. We would be happy to provide you with the references for the tables tomorrow if that would satisfy the MVEIRB.

THE FACILITATOR EHRLICH: I think that probably would help parties understand in more absolute terms the information you've been getting across in the presentations. So I'm not -- I don't want to call it an undertaking because it's just a little bit of homework. This isn't something coming up at the undertaking date.

I certainly appreciate that, you know, this information is spread over quite a number of different documents. If you can do that it would help.

Does anyone else have any other questions on carnivores, other ungulates, species at risk or birds? I see Fred Sangris, of the Yellowknives Dene First Nation, has one.

MR. FRED SANGRIS: Thank you. Can you take us to slide 68. Yes. Now as I read this there -- most -- all of them have a special concern and these are six (6) species at risk that have been observed in NWT. I wanted to know where the information come from on particularly grizzly bear and wolverine. Thank you.

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. Fred, just so I'm understanding you, you're wondering where -- how that categorization comes from in terms of the COSEWIC, SARA and NWT status?

MR. FRED SANGRIS: Yes.

MS. VERONICA CHISHOLM: COSEWIC is a federal program that provides a -- a listening for wildlife species, as well as the species at risk, the SARA status. And the NWT is a local government one. So I'm not sure if I answered your question.

MR. FRED SANGRIS: Yes, you did. I

just wanted to know where the information come from, because I know who SARA's group is.

The Yellowknives Dene have a camp up in -- in MacKay Lake. We have two (2) camps, on the north and south, which is our hunting and harvesting camp.

Within the last three (3) years I've -- I've been going up there every fall. Last year I observed many grizzly bears in our camp, up to six (6) grizzly bears. This fall I went back with young people and observed three (3) grizzly bears by our camp, as well as wolverines.

I spend close to maybe twenty-five (25) years back and forth to MacKay Lake, first with sled dogs, and then with a skidoo and now with a truck and then planes. But wolverines and -- for sure are not a specie at risk.

Tonight I might get attacked by wolverines just going home, because last week just downtown on Latham Island near my home there was a -- a wolverine that was observed there by children and we watched it leave across the lake there at night.

But wolverine for sure, they're all over the place, and they -- and they're very impossible to -- to get rid of. They're -- they're a very tough animal and they -- they are carnivores. They --

they're like ravens, they eat anything and they can go anywhere. They're one (1) animal that can never be gone. I don't believe they're -- they're a specie at risk.

If you talk to the trappers and hunters with the Yellowknives Dene and Lutsel K'e they -- they will probably tell you the same, including Wekweti, that there within the tree line there are so many wolverines, and that as hunters when we go to our camps we always have trouble with them. They seem to be around all the time.

I -- I want to know where I can get the information or COSEWIC is it? Where can I get that information so I can read up on it? Thank you.

(BRIEF PAUSE)

MR. DAMIAN PANAYI: Hello, Fred, it's Damian. I'll try and answer your question there. You picked up on a point which does make it difficult to write these environmental assessments, which is that the COSEWIC and the SARA status refers to a national listing.

So that's a -- a national assessment of the status of those species across Canada. And certainly species such as grizzly bear and wolverine, although we might consider them to be in healthy shape here in the Northwest Territories, we're very fortunate, whereas in other places such as Alberta or Ontario where there's a lot more development in -- in those areas, those species are not doing quite as well, which is why they show up on those federal listings and we legally have to include them in our environmental assessment.

But if you'd like some more information I'd refer you to a website, and I hope I'm getting this right, but it should be www.sararegistry, that's S-A-R-A registry dot gc dot ca. And that's where we get -- that's where we got this information.

MR. FRED SANGRIS: Thank you.

THE FACILITATOR EHRLICH: Thank you. Does anyone else have any other questions? I see Madelaine Pasquayak has -- Pasquayak has a -- a question from the Tlicho Government.

MS. MADELAINE PASQUAYAK: Thank you. Madelaine -- Madelaine Pasquayak. I was just looking at slide number 69 and I could't help but wonder that there's a lot of birds that are -- that will be at risk and we also have a picture of a nest here of a peregrine bird.

And I was just wondering like if there's -- if -- if the regional and local study area is full of nests during the summer, I was just wondering what time of the season would the project be moving in to -- to -- to clear some of the land that will be needed for the project.

(BRIEF PAUSE)

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. Thank you, Madelaine for that -- that comment and question. We've been surveying the area over a number of years and the closest nest we've found to date, just to be clear, was 18 kilometres away.

But I think De Beers will be undertaking nest sweeps in advance of construction to ensure that there's no nesting birds within the project area.

THE FACILITATOR EHRLICH: Okay. Does anyone have any other questions for the developer on the subjects we're discussing here?

If not, I'm going to throw back -- I know it's getting late. I'm going to throw one (1) more question out, which came from Dr. Comers earlier on regarding vegetation. We just didn't want to -- not

-- pinch the time for caribou. So I -- I shelved it, but since it's only just 5:00 and it seems like a fairly short question to me, I'm going to throw it out there to see -- see if you'd like to respond.

Slide 21, of your presentation talks about different kinds of reclamation species and -- and plants. I'll give you some time to scroll backward. There we go. Slide 21.

Dr. Comers says he didn't get from the presentation:

"If you intend to..."

See, at the bottom there you talk about value as reclamation species? It was unclear to Dr. Comers if you're planning to identify which of the species are good reclamation species within your area:

"Do you -- if you are intending to identify them, are you planning to collect the seeds and use them for reclamation? Do you plan to use only those species and not others? If so, then reclaimed areas will not be restored to what they were at baseline. In other words, are you reclaiming them to the same kind of species composition as was there in

advance? This would also affect your
impact predictions, if you rely on
natural re-vegetation/succession."

And Petr Comers wanted some clarity on that. Thank you.

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. De Beers is planning to undertake reclamation trials throughout the project timeline, and we will be developing a more detailed reclamation plan for the project that will include a plan for re-vegetation. And a plan for either the collection of reclamation seeds or some other practices that -- and we will also liaise with the other mines in order to receive key learnings on reclamation and re-vegetation success. Thanks.

THE FACILITATOR EHRLICH: Sounds good. Thank you very much. I'll keep closing comments quite short. The -- I will point out that there are a few different homework items that were going on.

I remember that De Beers was going to meet with the Gahcho Kue Treaty 8 Tribal Corp. to go over some of your caribou stuff.

I was in and out for today. So are there any other homework items, besides the actual undertaking that you guys have recorded that you're going to be bringing in tomorrow morning?

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. One (1) that I -- that I had committed to -- to Madelaine in terms of the caribou and the GNWT health study. I'm going to give the reference into the record. I'm actually going to ask Cam to read the reference into -- into the record. And I'm going to try and locate the report for tomorrow to provide her a copy with it.

MR. CAMERON STEVENS: Cam Stevens, Golder Associates. The reference is a report -- a tech -- published by Yawn (phonetic), Adam Zusky (phonetic), John Balanger, Bruno Croft, Dean Cluff and -- and -- and other authors. Published in 2009, titled "The Decline in the Bathurst Caribou Herd 2006 to 2009," a technical evaluation of field data and modelling. This report is a draft technical report that was made available in December 2009.

THE FACILITATOR EHRLICH: Thanks, Cam. De Beers, any other homework items that you recall over the course of the day?

MS. VERONICA CHISHOLM: Veronica Chisholm, from De Beers. Yeah, we were going to check on the status of the Horned Grebe, and if there's been any changes to that according to SARA classifications.

THE FACILITATOR EHRLICH: I -- I definitely recall that. Any others?

MS. VERONICA CHISHOLM: Veronica Chisholm, for De Beers. I can answer that last question.

We just checked, and the Horned Grebe does not have a status under SARA, so I think we've answered that. We just looked it up.

THE FACILITATOR EHRLICH: Maybe they've reassessed it. Thank you for doing that. It wasn't even homework. You solved it on the spot.

We also have an undertaking, and I'm going to ask my Co-Chair Chuck Hubert, panel manager, to paraphrase what the undertaking was.

THE FACILITATOR HUBERT: The following is roughly what will be found in the transcripts. Some of the words may be different, but I think the intent is -- is as follows.

De Beers to provide rationale for reasonably foreseeable developments that were selected during the cumulative assessment, and why projects described by YKDFN, Todd Slack, were not selected.

I think that pretty much captures it.

THE FACILITATOR EHRLICH: Thanks. With that, we're -- we're going to wrap it up here. We actually are only like seven (7) minutes late, which is not bad considering where we were after the last break, and some of the important subjects that have been covered here togay -- today.

I'd like to thank De Beers and the presenters for the obvious effort they put into preparation of presentations, as well as the -- the answers they were able to provide, and their willingness to try and do homework here to keep the undertakings down while providing parties with the information they need. It's -- I mean, I'm seeing a -- you know, quite an honest effort from where I'm sitting, and it really does help keep parties informed, and keep the process moving efficiently, so that's a good thing.

We are starting tomorrow morning at 9:00, and we will see you then. Thank you.

--- Upon adjourning at 5:10 p.m.

Certified correct,

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Wendy Warnock, Ms.

R