Enbridge Northern Gateway Project
JRP Hearing Notes

Day 58 – February 22, 2013 – Prince Rupert – Vol 142

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Contents

Order of Appearances

Northern Gateway Panel 2 - Prince Rupert

Marine Emergency Preparedness & Response

Mr. John Carruthers	Mr. Randy Belore	Mr. Jeffrey Green
Dr. Alan Maki	Mr. Owen McHugh	Mr. Greg Milne
Dr. Edward Owens	Dr. Walter Pearson	Dr. Jack Ruitenbeek
Dr. Malcolm Stephenson	Mr. John Thompson	Mr. Chris Wooley
Mr. Dennis Yee		

Examination by Mr. Jesse McCormick for Haisla Nation (continued)
13370

Mr. McCormick asked about the sources and calculations in NGP's Undertaking, Exhibit B205. Discussion then turned to the implications of potential inaccuracies or errors in NGP's DNV report.

Spill models and NGP's revised specifications

Mr. McCormick asked about the assumptions made in TERMPOL 3.15, with regards to modelled spills. Mr. McHugh confirmed that the modelled failures considered "credible worst-case discharge", from a loading arm failure. Mr. McCormick asked if it were true that the models were based on forecasted loading and discharge rates at Kitimat Terminal, rather than actual design specifications for the marine terminal, as indicated in Exhibit B23-34, page 104. 13403

Mr. McHugh answered that the numbers in the assessment are considered preliminary and are based on "the best available information at the time…and they are in general alignment with what we'd expect for the operational aspects for the loading arms." 13415-13416

Discussion continued with regards to spill modelling and NGP's increased volume and transfer rates. Mr. McCormick canvased the witnesses with regards to the importance of using actual specifications as inputs to spill models. See transcript for greater detail. 13417

Mr. McCormick asked if NGP agreed that loading arm failures are not the only potential spill source at the marine terminal. Mr. Green answered that such failures may not be the only spill source, but that it is "the most realistic spill that could occur at the terminal given the marine terminal design." 13465-13466

Mr. Green also agreed with Mr. McCormick's suggestion that loading lines connecting the loading arms to the oil tanks could cause a spill. He stated that such an occurrence would be mitigated for. 13467

Mr. McCormick asked further questions about the loading arms from the TERMPOL 3.15 report, Page 104, and the characterization of spill risks. Discussion continued. Mr. McCormick questioned how reliable NGP's assessment were of "credible worst-case" examples, given that their evidence cites potential spills in excess of those given for worst-case. Discussion on the matter continued at length. 13473-13531

Discrepancy with regards to emergency shutdown times

Calling up Exhibit B3-22, page 111, Mr. McCormick asked about emergency shutdown times. Mr. McHugh acknowledged that the TERMPOL 3.15 report (at page 104) and the previous exhibit have a 7-second difference in emergency shutdown times but indicated he wasn't aware of the reason for the difference. He directed such questions to the operations panel. Discussion moved to the filing dates of the two reports, and whether or

not the design specifications for the marine terminal were available prior to the completion of the TERMPOL report. Mr. McHugh explained, "design was completed at a preliminary level and…would be looked at in the future for updates and changes." 13533-13532

Mr. McCormick continued with questions about the relationship between the model inputs in the DNV report and the design specifications for NGP's proposed marine terminal. His questions were again directed to another panel and he submitted that the next panel would not be able to answer questions related to the TERMPOL report. He brought forward a motion that someone from the current panel sit on the DNV panel. 13564

NGP's reliance on the Di Toro Model

Mr. McCormick asked if Dr. Stephenson agreed "many important scientific findings have been published in the past decades on the mechanisms of exposure, the modes of toxic action, and the effects of oil contaminants on aquatic species" and were not included in NGP's documents on the subjects. Dr. Stephenson agreed, "many important findings in hydrocarbon toxicology have been published in the past decade." He stated that he wouldn't comment on the references in NGP's documents. 13589

Dr. Stephenson agreed that NGP has relied upon the Di Toro Model for evaluating risks of oil exposure to fish in Volume 7C and related TDRs. He acknowledged that Di Toro had noted his target lipid model doesn't account for toxic effects of oil contaminants in the early life stages of fish. 13593

Mr. McCormick continued with questions about NGP's application of the Di Toro Model to assess toxic effects on fish and Dr. Stephenson stated that NGP considers the model's benchmarks "the best available benchmarks for evaluating the chronic effects of oil on fish." Questions continued with regards to reliance on the model, which Mr. McCormick indicated could underestimate the extent and degree of the effects of oil on fish. 13599

Dr. Stephenson disagreed that the model could underestimate effects, and reiterated his confidence in the model. Dr. Maki added comments about his confidence in the "state-of-the-art-model", noting that any model is "always subject to further refinement." Discussion on the subject continued. 13625-13637

Aboriginal representation on NGP's proposed scientific advisory committee

Mr. McCormick asked if all Aboriginal groups whose traditional lands or waters may be impacted by the project would be invited to participate in the Committee. Mr. McHugh pulled up Exhibit B164-13, page 13, which indicates preliminary plans for the committee. Mr. McCormick asked if panel members on the committee would be included by invitation only. Mr. Green answered that such committees generally required nominations for representatives. He indicated that the community and Aboriginal panel would speak further to the subject, but that the committee was more oriented towards industry. 13639

Mr. McCormick again asked if Aboriginal groups affected by the project would have a seat on the Committee and Mr. Green answered that although the details hadn't been worked out, the intent would be to have one representative per First Nations group. 13658

Mr. McHugh corrected Mr. Green's comments indicating that the Committee would have to have limited membership in order to keep it functional. He stated that future meetings would determine "the most appropriate representation for various groups." 13662-13666

Discussion turned to whether or not the results of the Committee would be publically available. 13667

Relevance of findings from the Kalamazoo spill

Mr. McCormick brought up a report by Enbridge on temperature effects on submerged oil in relation to its spill in the Kalamazoo River. He asked if NGP submitted the document to the JRP. Mr. Milne indicated that the report had not been submitted because it was not relevant. Discussion continued on the relevance of freshwater spills to the fate, behaviour and clean-up of spills in the subject area. 13681

More on questions of the TERMPOL report

In regards to Mr. McCormick's earlier motion, Mr. Langen noted that his questions could be asked of the shipping and navigation panel. Mr. McCormick agreed. 13720

Detection and recovery of sunken or submerged dilbit

Mr. McCormick asked if NGP agreed that the sinking or submergence of spilled diluted bitumen is a legitimate concern of the Haisla Nation and Mr. Belore answered that NGP had spoken at length on the subject. Mr. McHugh indicated that response plans would account for the possibility of submerged oil through sediment interactions. 13729

Questions continued on the poling method used to locate spilled oil at the Kalamazoo spill, which the panel confirmed may be used in the subject area marine environment in the event of a spill. Mr. McCormick questioned the effectiveness and impacts of the method and discussion continued. 13733

Mr. Milne confirmed that the US Environmental Protection Agency had directed Enbridge that a minimum water temperature of 15.5 degrees Celsius was required for poling. Mr. McHugh confirmed that the NGP project area water temperature will usually be below 15.5 degrees Celsius and indicated that there are other methods available for detection and recovery of submerged oil. Dr. Owens offered further discussion on other detection and recovery techniques, noting that the application of poling is "very site-specific." 13805-13819

NGP's numbers on spill recovery

Mr. McCormick asked Mr. Belore about details of the samples used in NGP's studies of the fate and effects of bitumen, specifically in regards to the pour point of the substance. Mr. Belore confirmed that pour point can affect the fate and behaviour of oils. Mr. McCormick continued with questions related to recovery statistics from a study whose

numbers contradict those in an NGP study on the subject, seen in Exhibit B83-17, page 171. 13825

Mr. McCormick again noted that a separate study indicates 40 percent of valued ecosystem components affected by oil spills haven't recovered, while NGP's number on the subject is 19 percent. He asked if NGP believed that 19 percent recovery is an acceptable rate. Mr. Pearson explained that the given numbers reflect past spill recovery efforts and that NGP intends to "produce a response capability that will accelerate recovery". He indicated that the previously noted study takes into account other disturbances such as logging, in addition to oil spills. 13853-13857

Discussion on NGP's statistics on ecological recovery following spills, from Exhibit B83-17, continued, with statements about the implications of such numbers. In particular, Mr. McCormick asked for agreement that some of the previously expressed concerns of interveners on impaired recovery are valid. Dr. Pearson provided explanations of the difference between recovered and unrecovered cases. He stated, "the literature is telling us that recovery occurs. It's more common than not. It's also telling us that we need to examine why it's not recovering. And to build our response capability to address those kinds of things that we know are problems". 13859-13889

Looking at page 8 of the study, Mr. McCormick noted the statement, "*Recover after oil spills does occur*." He asked if given the evidence, it would be more accurate to state: "some biological and human environments recover or show signs of recovery". Dr. Pearson spoke about NGP's rationale for the study in question, in an effort to examine whether or not it was true that ecosystems don't recover from oil spills. He stated that such "gloomy predictions… are not supported by the scientific evidence." 13893-13899

Discussion continued on ecological and human recovery from the impacts of oil spills. 13904

Recovery of herring populations and other Valued Ecological Components

Dr. Pearson agreed "that a healthy, functioning ecosystem contributes to a healthy society and economy for the Haisla Nation." 13914-13915

Mr. McCormick brought up a report from the Exxon Valdez Trustee Council, which indicates that Pacific herring aren't considered to be recovering from the impacts of the spill. He noted that NGP's Exhibit B83-17, page 92 indicates that herring populations have not returned to pre-spill conditions. He asked about the potential contradiction between the two statements. Dr. Pearson answered that the attribution of the decline of the herring population to the oil spill hasn't been proven, even 20 years after the spill. He stated that researchers agree that the poor recovery of the populations is due to natural factors, rather than oil. Discussion on the matter continued. 13924

Mr. McCormick asked about the use of the term "*non-floating oil*" as opposed to "submerged", in the exhibit. Dr. Maki spoke about the rarity of spilled oil sinking or entering the water column. 13955

Mr. McCormick asked if NGP's definition of recovery in the exhibit considered the restoration of a Valued Ecological Component (VEC) to erase the harm caused by an initial disturbance. Dr. Pearson answered that effects or injuries do take place following a spill. Discussion turned to the definition of *value* of ecological goods and services. 13990

Mr. McCormick asked about the consideration of spill containment or clean-up data with regards to the VECs in the study, Dr. Pearson agreed that the document concludes that such factors can significantly impact recovery rates for VECs. Discussion continued with regards to cases where clean-up efforts exacerbated adverse impacts of oil spills. Dr. Pearson indicated that such cases were more common in the 1970s and 80s. 14011

Looking at Exhibit B83-17, page 154, Mr. McCormick asked about the study of the impacts of the Kalamazoo spill on birds and subsequent recoveries. He asked if there are any published results of studies on the spill showing that VECs have recovered. Mr. Milne indicated that he wasn't aware of whether such studies had been completed. 14031

Examination by Mr. Nathan Cullen, MP, Skeena – Bulkley Valley 14062

The use of booms in spill recovery

Mr. Cullen asked if containment booms are the first line of defence in the event of a marine spill. Mr. McHugh answered that prevention is the first line of defence, but that in the event of an accident, booms are one of the first countermeasures used. He added comments about the use of dispersants which have an environmental cost, but can cause greater benefit overall. 14063

Mr. Cullen asked if booming technology is required for skimming and in situ burning and Dr. Owens confirmed that booms are part of the recovery efforts and are used for multiple purposes. 14070

Mr. Cullen pointed to a study conducted by SL Ross Environmental Research, in Exhibit B25-4, which models surface currents travelling at one knot or faster. He asked further questions about the effectiveness of booming when ocean currents are stronger than one knot. Dr. Owens answered, "there certainly is a strong relationship between boom effectiveness and currents… we understand very well the dynamics of booms and how they work with respect to currents and oil". 14075-14082

Mr. Cullen continued with questions on the productivity of booming in strong currents and Dr. Owens agreed that booms are less effective as a static barrier in such conditions, but that they can be positioned parallel to currents to "divert them and progressively move them from one area to another." He also indicated that recent developments have made booms capable of working in stronger currents. Discussion continued on how booms are moved. 14083-14094

Mr. Cullen asked about the effectiveness of booming in conditions of strong currents and significant wave activity. Dr. Owens answered that different boom types are used for different conditions. Mr. McHugh indicated that strong wave areas-open waters- are generally not areas where strong currents exist- confined waters. He also submitted,

"there are limits on the use of booms in certain environments", in which case other options are pursued. 14095-14109

Mr. Cullen asked if limitations to the effectiveness of booming were considered in NGP's submission. Mr. McHugh answered that NGP had considered the issue and discussed it during the previous few days' hearings. 14114

Oil submergence in high-wave activity

Mr. Cullen sought clarification from earlier testimony on wave activity, asking about the ratio of wave height to the depth at which oil can be submerged. Dr. Owens spoke about findings from the National Oceanic and Atmospheric Association on the subject. Mr. Cullen asked further questions on the fate of oil in breaking waves, and whether oil persists in the water column. The witnesses spoke about temporary entrainment and indicated that in breaking waves, a portion of oil will remain on the water's surface, while some will be submerged, though will resurface once a wave's energy dissipates. 14118

Discussion continued around the interaction of oil and waves, and the likelihood of sediment interaction to cause oil to remain submerged or sunken in shore zone areas. 14138

More on spill recovery capabilities and subcontractors

Mr. Cullen asked if there are scenarios in which skimmers are used to contain oil that hasn't been boomed. Mr. McHugh indicated that such a scenario could occur if thick oil washed up near a shoreline, which would naturally contain the oil to enable the use of a skimmer. He also indicated that there are new skimmers that can operate without booms in some instances. Discussion continued with Mr. McHugh providing details of NGP's time estimates for responding to spills, and the equipment used for doing so. 14185

Mr. Cullen asked about the contracts for enhanced response, seeking to understand how contractors are held accountable for NGP's standards. Mr. McHugh indicated that contracted response organizations would be capable of meeting NGP's response time commitments. He also stated that organizations' response plans could be reviewed by Transport Canada and Mr. Carruthers stated that plans could be independently audited. 14204

Mr. Cullen continued to seek an understanding of the extent to which subcontractors would be held legally accountable, asking about NGP's liability protection on the matter. Mr. Carruthers again spoke about Transport Canada's regulation of response organizations, and indicated that such organizations need to be certified and tested. 14215

Mr. Cullen returned to the subject of skimmers, asking how effectively they remove diluted bitumen, in real marine conditions. Dr. Owens explained that there is much experience cleaning up heavy fuels in cold temperatures in Canada. Discussion continued. 14222

Mr. Cullen asked about the possibility of a spill near the terminal being pushed into the river inlet. Mr. McHugh answered that booms would be in place around tankers during loading to prohibit movement of oil into freshwater environments. 14234

Specific gravity of bitumen and the impact of weathering on sinking capability

Mr. Cullen asked about specific gravity of diluted bitumen and was encouraged to move on to another line of questioning, as the subject had already been discussed extensively. He asked if NGP was committed to only accepting bitumen with a specific gravity of less than 1. Mr. Milne answered that the upper limit for the density of the product to be shipped would be 940 kilograms per cubic metre. 14248

Mr. Cullen asked further questions about tolling conditions that NGP would accept from producers, given the changing specific gravity of products as a result of weathering. Discussion continued and Mr. McHugh stated that NGP would not commit to accepting bitumen with specific gravity lower than 1. Mr. Belore indicated that the bitumen products will not sink as a result of weathering alone. 14279

Experience with dispersants and diluted bitumen

Mr. Cullen asked what tests NGP had performed on dispersants outside of the laboratory. Mr. McHugh answered that no testing with diluted bitumen had been done on a water surface. Mr. Cullen asked what type of experience exists with dispersants and diluted bitumen in any marine environment, by any company. Mr. McHugh compared experience with Bunker C oil, and stated, “there’s actually a lot of experience around the globe of dealing with similar styles of oil in the marine environment.” 14290-14299

Discussion on the testing of dispersants continued. Mr. Belore spoke about testing of MacKay River heavy bitumen, which showed that the product becomes more viscous as it weathers. He pointed out, “With all oils that weather and become more viscous, dispersant effectiveness will be reduced.” 14300-14311

Mr. Cullen asked how transferrable the test results are to different environments. Mr. Belore spoke about his experience testing heavy fuel oils in wave action in laboratories and indicated that the effectiveness of dispersants would increase with greater wave energy. 14312

Questions on the Quantitative Risk Assessment

Mr. Cullen called up Exhibit B23-15, and asked how risk was calculated in the table on page 60. Mr. McHugh explained that return period was used because it is one of the easier ways to understand risk. 14334

Mr. Cullen noted that large spills have been correlated with large environmental impacts, he asked if it was fair to say that smaller spills can also have significant impacts depending on location. Mr. Green answered that he didn’t think it was a fair statement, “there isn’t a direct correlation between spill size and the effect; there’s many factors determine the effects of a spill.” 14360-14366

Mr. Cullen asked if NGP or its subsidiaries are members of the International Tanker Owners Pollution Federation. Mr. Carruthers confirmed they are not. Mr. Cullen noted that the organization classifies a large spill to be 700 tonnes (5131 barrels). He asked why NGP considered 31,500 barrels to be a large spill, as listed in Exhibit B23-9, Adobe 13. Mr. McHugh answered that the DNV panel could give more details on NGP's spill classification. He indicated that the numbers given relate to calculated probabilities for spills and the mitigation measures taken for response planning. 14374

Examination by Ms. Carrie Humchitt for Heiltsuk Tribal Council 14432

First Nations AFS agreements with DFO, and proposed mitigation strategies

Ms. Humchitt asked about NGP's awareness of AFS agreements related to First Nations FSC harvesting. Mr. Green indicated his understanding that the strategy gives priority allocation for certain fisheries over commercial and recreational use. Ms. Humchitt asked if the panel was aware that the agreement limits Heiltsuk's fishing to certain areas. Mr. Green explained that there are gas vouchers as well as other forms of compensation, which would be arranged with communities to identify what would be useful for them in the event of a spill. Mr. Green answered that there had not been a discussion with the DFO about First Nations being able to go beyond their area limits for FSC harvesting. 14433

Mr. Green confirmed that he was aware that if First Nations were forced to fish beyond their area limits, it may encroach upon another Nation's territory. He stated "it would depend on the conditions of the spill and the size of the spill." 14443-14444

Discussion continued in general around NGP's proposed mitigation plans, First Nations representation on the proposed technical scientific advisory committee, and the development of community response plans. Mr. McHugh confirmed that in referring to community response plans, NGP is including both Aboriginal and non-Aboriginal communities. Ms. Humchitt asked about awareness of the constitutional rights of Aboriginal communities, which differentiate them from other communities. 14445

Lack of traditional land use studies

Ms. Humchitt asked for agreement that First Nations' perceptions of risk should inform the assessment. Mr. Green answered that NGP agreed, which was the intent of the current sessions. Discussion turned to the lack of traditional land use studies (TLUS) in the environmental assessment. Ms. Humchitt asked how NGP had sought alternative sources for more understanding of TLUS and Mr. Green pointed to a provincial database. He confirmed that at the time of the assessment, NGP did not have a TLUS from a Coastal First Nation. 14463

Discussion continued around NGP's attempts to fund a TLUS from a Coastal First Nations group. Mr. Green confirmed that NGP did not directly approach Heiltsuk for such a study. 14470

Diluted bitumen spill testing and the comparison of real world oil spills

Following up on Mr. Cullen's previous questions, Ms. Humchitt sought clarification that no testing had been conducted with diluted bitumen in an open water area. Mr. McHugh answered that there hasn't been a spill of dilbit in a marine environment, but that other heavy oil spills have provided insight on the matter. Ms. Humchitt asked if the Kalamazoo River spill was the closest example to the potential impacts to the Kitimat River and estuary. Mr. McHugh spoke about every spill being unique and contingent upon conditions. 14480

Discussion moved to the likelihood of tides blowing a marine spill into a river and estuary area. Ms. Humchitt asked if NGP had considered the potential risk of a tsunami in the area. Mr. McHugh answered that the terminal design had taken such risks into account, and indicated that major earthquakes are not anticipated to cause tsunamis in the upper Douglas Channel area. 14487

Ms. Humchitt asked about the previous mention of spills around the world which can be applicable to the assessment for the current project. Dr. Owens spoke about his experience studying spills, which inform spill response prevention and capabilities. 14519

Dr. Owens spoke about his experience with the Nestucca oil spill which formed tar balls. Ms. Humchitt asked if tar balls could form in the case of an NGP spill. Dr. Owens answered that the Nestucca spill didn't have any source control or mitigation in the open ocean, whereas NGP plans to have mitigation measures in place. 14523

Dr. Maki confirmed that the majority of the oil spilled from the Exxon Valdez spilled within 6 hours. Noting that NGP's anticipated spill response time is 6-12 hours, Ms. Humchitt asked how this would involve adequate response. Mr. McHugh spoke about the use of escort tugs and other differentiating factors such as double-hulled tankers. Dr. Maki made other distinctions between the Exxon spill and modern day technology. 14543

More on emergency response preparedness and voluntary compensation funds

Ms. Humchitt asked for agreement, "even with the improvement of technology and systems, the actual percentage of, for example, recovered oil hasn't improved noticeably". Mr. McHugh again spoke about the unprecedented level of "general preparedness" of the proposed project. 14545

Ms. Humchitt asked how human errors are being considered in NGP's emergency preparedness plans. Mr. McHugh spoke about the importance of training and exercises. 14558

Mr. Carruthers confirmed NGP's reliance on international conventions for liability of spills, such as the IOPC. Ms. Humchitt asked if NGP would voluntarily set aside a tanker spill compensation fund, noting BP's $20 billion compensation following the Horizon spill. Mr. Carruthers explained the ways in which NGP has gone above and beyond in terms of its extended responsibility for prevention and response measures and weather information. He indicated that liability falls on tanker owners or those who control assets.

Discussion on the matter continued and Mr. Carruthers stated that NGP has contributed to spill funds, which the Government of Canada can assess with regards to its sufficiency. 14576

Noting the grounding of the Queen of the North, Ms. Humchitt asked if NGP planned to delay operations if weather required it. Mr. McHugh answered that operational procedures would require delays if necessary. 14614

Cultural impacts of a spill

Ms. Humchitt asked if the panel was aware of the "crucial cultural component" of fishing, which cannot be replaced by country food gathered elsewhere. Mr. Wooley answered that NGP understands "harvesting is very important part of Aboriginal culture and that it's the keystone of sharing and other cultural activities in the communities." He added comments about the importance of having a culturally appropriate planning process and spoke about his experience with spill effects on harvests which are "short-term and they're not welcome, but they are not permanent." 14633-14636

Pulling up Volume 38, line 28623, Ms. Humchitt asked if the panel was aware, "if we were not able to harvest that this would be considered to be a form of genocide to our people?" Mr. Wooley called up Exhibit B83-17, Adobe 257 and spoke about NGP's recognition and respect of the strong connection between harvesters, resources, land and water. He stated, "terms like genocide that were applied to the Exxon Valdez spill effects… that's not what happened. There were upsetting effects from that, but there were short term effects from that event… that's the reason that…this group has talked about putting together a plan, a framework to ensure that there are not unmitigated effects from and oil spill. 14659-14665

Collapse of herring following Valdez spill & impacts to killer whale populations

Ms. Humchitt followed up with questions about the three species that haven't recovered from the Valdez spill, noting that they would be an example of long-term effects, contrary to Mr. Wooley's statement. Mr. Wooley answered that he was speaking of cultural effects. Dr. Pearson confirmed that herring could not be harvested for approximately 15 of the 21 years since the Valdez spill and spoke about the decline in populations as a result of natural factors, not the spill. Discussion on differing explanations for the herring collapse continued at length, please see the transcript for greater detail. 14666

Ms. Humchitt asked if the panel was aware of concerns of herring populations along the proposed tanker route. Dr. Pearson indicated awareness of the central coast stocks not being fished for the past 4-5 years. Discussion continued around the pacific herring stock's status as a threatened species as well as the status of the killer whales along the route and the differing opinions of the causes for the decline in that species. Dr. Maki explained that the causes for the killer whale population decline "are ambiguous at best", and that there is conflicting research on the matter. 14737-14761

Discussion on the matter continued with Mr. Green stating, "no one can say whether oil hurts cetaceans or not at this point. We can't say that EVOS didn't have an effect on killer

whales… no one is debating that an oil spill… would not have a significant adverse effect on the environment." He continued with comments about the importance of prevention and rapid response measures. Dr. Maki added comments about the conflicting rationale behind the cause and effects of the three species thought to be affected by the Valdez spill. 14762-14777

Ms. Humchitt asked about the research behind the decline in reproduction of the killer whale populations following the Valdez spill. Dr. Maki indicated that there is agreement that one population hasn't reproduced since the spill, but again explained that it is unreasonable to assume such impairment was a result of the spill. 14778

The cultural significance of killer whales

Mr. Green and Mr. Wooley confirmed that the panel is aware of cultural significance of killer whales to First Nations communities. Ms. Humchitt asked if they could explain it. Mr. Wooley stated his understanding that the species "are understood to be a transformation species." Ms. Humchitt asked if he was aware "that there are crests of killer whale clans". Mr. Green answered, "We're aware that in a number of the coastal Aboriginal groups that there are killer whale clans, raven clans, wolf clans and the like. That's my familiarity. And… as I understand it the other name is black fish I believe." 14789-14797

Ms. Humchitt asked if the panel was aware "Heiltsuk Nation considers themselves to be one with the animals that inhabit our seas?" Mr. Green indicated that he had read the evidence on the matter. 14798-14799