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## **Order of Appearances**

Motion brought forward by Ms. Karen Campbell for the Coalition 3052

Preliminary matter brought forward by Mr. Richard Neufeld for NGP 3107

## **Northern Gateway Panel 2**

### Marine Emergency Preparedness & Response

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

Examination by Mr. Chris Jones for the Province of BC (continued) 3132

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## **Motion brought forward by Ms. Karen Campbell for the Coalition 3052**

### **Report on weathering of Cold Lake Blend should be in evidence**

At the close of questioning yesterday, Mr. Owen McHugh referred to a study in which “We tried to make this thing [Cold Lake condensate blend] sink and it didn’t.” Ms. Campbell moved that the report be filed in evidence, and other intervenors supported the motion. 3052

Later in the day, Mr. Dennis Langen said on behalf of Northern Gateway Pipelines (NGP) that they would file the report. Ms. Campbell argued that intervenors need some time to review the new evidence, and proposed that the Joint Review Panel (JRP) allow questioning at a later time. 3460

The JRP ruled that the report be produced, and said it will rule later on the additional relief sought by the Coalition. The report, "Mesoscale Weathering of Cold Lake Bitumen Condensate Blend", dated October 2012 by S. L. Ross is [Exhibit B193-2](#). 3886  
On February 8, the JRP ruled that the panel currently sitting will be available until the end of February and “parties may seek leave of the Panel to introduce rebuttal evidence or otherwise address the study.” [[Exhibit 326-1](#)]

## **Preliminary matters brought forward by Mr. Richard Neufeld for NGP 3107**

### **Struck from the record**

Mr. Neufeld stated that Motion #19 brought by Dr. Josette Wier [[Exhibit d217-57-1](#)] is “extremely disrespectful of an individual.” He suggested that if the JRP “do believe it to be offensive that you also have it removed from the public record.” 3107

## **Examination by Mr. Chris Jones for the Province of BC (continued) 3132**

### **More questions about the sinking fate of dilbit**

Mr. Jones asked why NGP was continuing to participate in studies about the behaviour of diluted bitumen. Mr. Randy Belore said it was “to further our understanding”, however, “all the evidence and all the work that I’ve done leads to the conclusion that these types of oils will not sink under the normal conditions without the presence of sand or some other material to cause them to become heavier than the receiving waters.” Mr. Owen McHugh said, “Environment Canada recommended this.” 3146

Mr. Jones asked if NGP had done any testing “in the environment.” Mr. Belore said that the mesoscale testing is in a tank. “It’s not modelling.” 3157

Mr. Jones: “Has there been ... any spills of diluted bitumen or ... similar oils?” Mr. Belore replied “There have been similar products shipped and used around the world for decades. [These are] residuals from refining processes that are heavier products at the end of the refining process that are then blended with a diluent. Usually it’s referred to as marine gasoil. It’s like a diesel product.”

“You’re starting with a heavy product that would be analogous to a bitumen that is then blended with a diluent to give you intermediate fuel oil ... that would be very similar to the characteristics of the bitumen products that would be shipped in this project. So there is a -- a wealth of experience on the behaviour of these fuel oils and their handling, their spill behaviour, their clean-up behaviour, clean-up requirements and impacts.”

“It’s been ITOPF’s (International Tanker Owners Pollution Federation) experience that oils generally do not sink unless exposed to sand or other particulates.” 3174

Mr. Jones’ discussion explored conditions under which diluted bitumen might sink, including in the Confined Channel Assessment Area (CCAA), where there is “a freshwater lens” or where there are high levels of suspended sediments as in Douglas Channel. Mr. Belore said that none of these conditions would result in weathered or emulsified oil picking up enough sediments to sink.

Mr. Jones, “Is it Northern Gateway’s evidence, I guess, at this point that irrespective of where the diluted bitumen might spill ... that there would be no mechanism by which it might sink?” Mr. Belore said we spoke about this yesterday. There is a situation ... in a very sandy beach area, ... under high energy where the sand and oil is tumbled together ... then, yes, in that case, it could pick up enough material that it could sink.” 3262

### **Will NGP have capacity to deal with sunken or submerged oil**

Dr. Edward Owens said that would be part of their response capability. He said that at Lake Wabamun in Alberta and in the Gulf of Mexico they had developed survey techniques to locate submerged up and to recover it. 3272

### **The density front in Douglas Channel**

Mr. Jones noted that in Douglas Channel, “There is a great degree of circulation between freshwater flowing seaward at the surface and deeper return of ocean water,” as described in [Exhibit B16-26](#), Adobe 28. Dr. Owens said this phenomenon – referred to as a “density front” - is typical where freshwater enters into a fjord. He said, “My experience in spills where we have density fronts present is the oil cannot cross a density front. There are actually dozens of examples of this.” 3281

Dr. Owens described it as “a natural boom,” but very dynamic, moving seaward and landward depending on discharge volume, and moving every six hours with the tides. “But it’s very difficult for the lighter freshwater and the denser seawater to mix.” 3303

Mr. Jones asked about challenges related to oil being entrained in the subsurface. Dr. Owens said that entrainment requires physical energy – wave or current energy – to mix

the oil in the upper layer, the top one or two metres, a surface phenomenon. “We’re not talking into the deep water column.” “As soon as the energy level is reduced slightly, it will go back up to the surface. It’s buoyant.” 3325

### **Details re acquiring capacity for spill response**

Mr. Jones asked, “Does Northern Gateway, at this time, have any detailed figures or calculations with respect to the equipment it intends to obtain, the personnel it would intend to retain or have in place for the purpose of spill response? Or is that all yet to be determined? Mr. McHugh replied that NGP has a letter of intent with Western Canada Marine Response Corp “to examine these types of issues.” 3344

Mr. McHugh gave a “high level” description or itemization of equipment and elements in the response hierarchy, starting at the “first line of defence”, the escort tugs, and the second line, fast rescue boats. His description begins at paragraph 3355.

He said at the end, “We could get into facts and numbers. I don’t think it’s important at this stage in the development.” Mr. Jones replied, “I’ll follow up a little bit with that. ... What level of detail have you got at this point with respect to the actual numbers and facts?” Mr. McHugh: “We’ve looked at these numbers internally.” 3372

### **Fisherman’s Oil Spill Response Team**

Mr. Jones referenced Volume 8C, [Exhibit B3-37](#), Adobe 44, “A fleet of locally owned and operated support vessels will be identified to mobilize personnel and to support on-water activities.” Mr. McHugh explained that there are two levels to this: Project-dedicated vessels which would be owned the independent response organization (RO) and vessels of opportunity. Western Canada currently operates the Fisherman’s Oil Spill Response Team. “They have 21 vessels on the north coast.” 3387

Mr. Chris Wooley said that in Prince William Sound, currently, Alyeska SERVS does have a fishing vessel training program which -- it’s a tool which allows an immediate response to marine oil spills by local fishing vessels and trained crews. Mr. McHugh added, “These are not volunteers. They’re trained responders. Their primary job is fishing.” More details begin at 3421.

### **Western Canada Marine Response Corporation**

Mr. Jones asked how many trained and dedicated marine spill responders there are in BC. Mr. McHugh replied, 161 on the north coast, 143 on the south coast, 32 members of the Fisherman’s Oil Spill Response Team on Vancouver Island – “well over 300 trained responders on the coast.” 3483

Mr. Jones: “Do you know the number that are dedicated on a full-time basis? Mr. McHugh replied that he does not have that number, but “there’s direct employees within Western Canada and then a lot of contract services that can be activated quite rapidly. Mr. Jones asked if NGP knows what dedicated personnel it will have for spill response. Mr. McHugh said that it’s not as simple a question “as you might imagine.” Discussion of personnel availability and logistics continued. 3490

Mr. Jones wanted to know if workers at the terminal – 182 of them, he thought - could be enlisted. Mr. John Carruthers said, “Not all, you’d have to maintain your operations safely so that those numbers would not be available to us. But there’s a far greater number that would be available. ... people who aren’t working that day. You’d cascade people in over and above that. 3502

Mr. McHugh said, in answer to an earlier question, that Western Canada has 27 individuals employed directly on a full-time basis on the coast. 3518

Mr. Jones asked how NGP’s response personnel numbers relate to numbers of dedicated personnel available for spill response in other jurisdictions? Mr. McHugh named the Oil Spill Response Group and National Response Corp. He said the SERVS model in Prince William Sound has in the order of 200 people. Dr. Owens described the system in Norway, and the structure at Sakhalin Island. He summed up: “It’s hard to make a comparison, really difficult to ... give you an exact number.” 3528

Mr. Jones said, “We have a concern about the real capacity for those cascading resources to be brought to bear quickly.” Mr. McHugh said they don’t understand Mr. Jones’ concern, but that “cascading is an internationally recognized best practice in response.” Mr. McHugh and other panel members responded, describing “best practices” with tiered responses and giving examples. Dr. Owens said the bulk of manpower and time is with shoreline cleanup. 3546

Mr. Jones asked if there was anything additional to what was in evidence about equipment caches that Northern Gateway plans on creating. Mr. McHugh said this is the preliminary plan, and described in general terms what NGP is considering. Mr. Wooley described the program in Prince William Sound. Mr. McHugh again: “The offer that we’re making ... it comes down to whether the community wants to be involved or not. We’re putting forward a lot of opportunities.” 3595

Mr. Jones put up a list of mitigation measures in [Exhibit B3-42](#), Adobe 5. He asked about the second one which refers to “using navigational aids as proposed by British Columbia Coastal Pilots and installing radar systems along the northern and southern approaches. “Will NGP be paying for and installing those?” Mr. Carruthers replied, “We could be.” But he suggested that others also benefit and should therefore contribute. 3620

### **Dispersants and In situ burning**

Turning to the Wright Sound spill scenario, [Table 10-6, Adobe 23], Mr. Jones quoted from the statement about dispersants, “Potential target areas are those in which oil on the water surface is not contained, with water depths greater than 10 m, and located more than 500 m from the shoreline. Dispersant stockpile sites and application aircraft are mobilized from the locations in the US.” He asked, “Who would initiate that request?” Mr. McHugh said, “The unified command.” 3643

Mr. McHugh said, “We would complete a net environmental benefit analysis as part of the detailed planning study to evaluate where the appropriate timing and application of dispersants may occur. The policy within Canada right now is that they do not pre-

approve dispersant use. ... That policy is being reviewed. ... Dispersants ... are one tool in the toolbox and you don't want to eliminate options.” “We're looking to have further discussions with regulators on this topic.” 3649

[Exhibit B63-3](#) is a report entitled “Effects of Dispersants on the Environment”

Mr. Jones asked if Mr. McHugh would explain the “various plans that are referred to.” Mr. McHugh put up [Exhibit B164-13](#), Adobe 11 which discusses the Scientific Advisory Committee and continues with Geographic Response Plans. Discussions with Western Canada Marine Response are ongoing. Contractual arrangements may happen around 2015 following approval of the project. He also referred to [Exhibit B46-40](#), “Tank Tests to Evaluate the Effectiveness of Corexit 9500 Dispersant ...” by S.L. Ross. His response begins at 3656

Mr. McHugh said that dispersants might be applied through contract arrangements with someone like OSRL (Oil Spill Response Ltd). Mr. Jones asked, where is the material kept. Mr. McHugh: Alaska, Washington.

Mr. Jones: “Obtaining the approvals for the use of those dispersants can be a time-consuming process. What kind of timeframe [are we] talking about if dispersant capability had to be obtained from other locations?” Mr. McHugh: “We’re looking to develop ... a strategy or a policy around dispersant use.” Dr. Owens said that in the US applications are not completed “on an incident specific basis. ... It’s done by telephone. The approval timeline is ... hours.” “The window of opportunity with dispersants is only relatively short, a few days at the most, the strategy is one to be able to respond within a few hours.” 3682

Mr. Jones asked, “If ... the process required to obtain equipment and the actual dispersants from another location were to take a sufficient amount of time that the commitment to respond to a spill couldn’t be met, Northern Gateway would have that capacity here then?” Mr. McHugh replied, “Absolutely.” 3694

Mr. Jones said, “Today we don't necessarily know what the effectiveness of dispersants and in situ burning might have in the abstract. That's something that Northern Gateway will be considering in the project-specific basis. Mr. McHugh replied, “No, I think this is a regulatory issue, not a knowledge issue. I think we have a very clear idea of when dispersants could be effective and when they could be used. But it's a regulatory decision and ... in the event of an oil spill ... you would make a decision based on the net environmental benefit.” 3752

### **Submersibles, Homeland Security, and we don’t know what we meant**

Mr. Jones asked if NGP had any plans to purchase a submersible to deal with sunken oil. The witness panel repeated their belief that the oil will not sink, except when it picks up heavier sediments near shore. Mr. McHugh said that would result in a “very patchy distribution of oil in the near shore environment.” 3764

Mr. Jones put up an aid to questioning (AQ6) from the US Dept. of Homeland Security relating to research on detection of heavy oil that is submerged or sunk. His questions related to why Homeland Security would be interested in something that would typically arise. Dr. Owens said it's the US Coast Guard Research Centre that's interested, and it is his personal view that "we're pushing the envelope of our understanding as to what more work we need to do to understand fate and behaviour of oil." Mr. McHugh said, "this is an initiative directed at the types of oils that we're not planning to handle." 3817

From [Exhibit B3-39](#) Adobe 5, Mr. Jones read, "Rapid containment and removal of hydrocarbons, in conjunction with emergency response, will reduce the effects on water and sediment. No specific mitigation measures are used for water and sediment beyond those for the general response." He asked what the last sentence meant. Dr. Malcolm Stephenson said, "Obviously we've been scratching our heads. Can ... you restate the question?" Mr. Jones asked again what that last sentence meant. Dr. Stephenson, "It's not completely clear to me." Mr. Jeffrey Green: "I don't think it reflects really the response of Northern Gateway." 3816

### **Oily waste storage**

Mr. Jones said, "Response activity - at least for on water - can grind to a halt in the absence of adequate storage for the recovered oil and water." Mr. McHugh mentioned the new skimming technologies and reduced amount of free water, five barges, a slop tank at the terminal, and Western Canada has contracts with barge companies across the coast. 3856

Mr. Jones put up the 2012 NUKA "Oil Spill Response Gap and Response Capacity Analysis ..." [[Exhibit D80-56-3](#), Adobe 47], Figure 3.3 "72 hour task force needs" He asked if the NUKA numbers are appropriate or accurate. Dr. Owens cautioned again about more efficient skimmers, that the (MSRC) Marine Spill Response Corporation vessels used with Deepwater Horizon are very large, and "We would not be ... developing our systems based on that size of vessel. We would be looking to vessels that are a much greater adaptability in terms of environmental conditions. It could be used in the confined channel areas as well as in open water area." 3900

According to Mr. McHugh, NUKA is predicting for scenarios of up to 20 of these MSRC style vessels. "I believe there's about 20 of those in North America." They are proposing "putting the same sort of response capacity" as in all of North America, "into one project area."

Mr. Jones: "Do they have these kinds of offshore task forces in the Alaska area?" Mr. McHugh, "No they do not." He added that SERVS jurisdiction extends through Prince William Sound to Hinchinbrook Entrance, and not into the open ocean. "What they use is similar to what we're proposing which is an additional sentinel tug, to the tethered escort tug. 3924

### **Mutual aid, need for excess response capacity, and indemnity**

Mr. Jones read from [Exhibit B3-42](#), Adobe 22 that for the Tier 3 spill scenario in Wright Sound, resources would be mobilized from Alaska, eastern Canada, and the US west

coast. “Given that this ... is within the CCAA, why would Northern Gateway not have the ability to respond to that spill on its own?” Mr. McHugh said this is evaluated at the time of the spill. “You still would draw on international resources. ... You over-respond. You bring all the resources to bear that you can. ... You move equipment away if you don't need it.” 3952

Mr. Jones moved on to questions about the ability of jurisdictions to move response equipment elsewhere as mutual aid. Must they have excess capacity? Do they need regulatory approval? Would NGP have excess capacity? Mr. McHugh said yes to the first two, and it depends on Transport Canada for the third. Western Canada is currently able to mobilize equipment to help other regions and maintain their capacity. 3982

Mr. Jones said, “There is no responder immunity provided under the Canada Shipping Act.” Would NGP consider “providing indemnities for responders?” Mr. McHugh said, “That really is a Transport Canada issue.” 4003

### **Incident command handoff of control to unified command**

They discussed mobilization timing, procedural details, needed approvals, from 4010.

Mr. Jones returned to detailed questions about the responsible party (the vessel owner in the case of a tanker spill, vessel owner or NGP if the spill is at the terminal) and the hand-off of incident command from the ship's captain to the independent response organization, and then to the unified command once it is established. Discussion included the reasoning behind NGP proposing its own response organization as a way for NGP to fulfill its commitments which exceed the obligations of Western Canada. 4049

### **Commitments need to be backed up with plans & community consultation**

Mr. Jones suggested that we cannot know whether NGP can fulfill those commitments without plans. Mr. Carruthers said he did not believe that at all. “I do feel like we have given the Joint Review Panel and the public enough information.” Referring to discussions with Aboriginal communities about emergency response, he said, “Some communities would not want to engage with us on that discussion until there's a decision made by the Joint Review Panel.” 4138

Mr. McHugh said, “Western Canada has about 47 trained individuals from local communities on the north coast. ... This isn't [a] new concept to them.” Mr. Jones asked what capacity NGP contemplates providing to communities to participate in plan development. Mr. McHugh said they would like to sit down with Haisla, do with the “four coastal communities, Haisla, Hartley Bay, Kitkatla, Klemtu and potentially Bella Bella, Shearwater area as well,” and “address a framework.” 4194

### **Testing spill response plans before operations**

Mr. Jones asked whether spill response plans will be exercised in advance of operations at the terminal? Mr. McHugh said yes, that NGP would fund them though some agencies would absorb their own costs to participate, and that these would be a combination of desktop and field exercises. Within a three year planning cycle, they would attempt to exercise all the elements within their system at least once. There will be a marine and a



pipeline program. This topic is described in the General Oil Spill Response Plan [[Exhibit B21-2](#), Section 14-3] and discussion continues in the transcript 4216

### **Geographic response plans**

Mr. Jones quoted from [Exhibit B3-39](#), Adobe 5-15]: “...identifying sensitive areas and developing geographic response plans (GRPs) for specific areas,” and later at Adobe 10-3, “...developing GRPs for key sites in the CCWA and the OWA.” He asked, why NGP would not develop GRPs for all the areas of the coast on the tanker routes. Mr. McHugh replied, “GRPs are a demonstration of the techniques that you would use to protect those types of areas. ... You don’t ... need a GRP for every single sensitivity along the coast. ... You’re trying to prioritize.” 4313

Mr. Jones said, “GRPs have been prepared for the Strait of Juan de Fuca and, in fact, the entire Washington Coast.” Mr. McHugh agreed. Mr. Jones asked whether they are specific and detailed with respect to equipment and personnel. Mr. McHugh: “Yes.” Dr. Owens added that they “identify in a generic way the amounts and types of equipment.” Mr. McHugh noted in the US, the states commissioned the GRPs - the Washington State Dept of Ecology and the Alaska Dept of Environmental Conservation own them. “The level of those plans is totally dependent on the participation of the B.C. Province and other groups in terms of the expansion of that area.” 4329

Mr. Jones put up excerpts from a Washington State GRP as an AQ. He asked if the NGP GRPs would have the same level of detail. Dr. Owens suggested they would. Mr. McHugh said “There should be a standard across the coast to developing these.” “There isn’t currently a one system approach in B.C. ... That’s really what we would like to work towards, is working with B.C. to say ... the best format ... is an online database that everyone can access publicly.” 4354

### **BC’s intention paper re “world-class” marine response**

Mr. McHugh said that with respect to B.C.’s recent intention papers on a world-class marine response, GRP is part of that process and we’re in complete agreement. “But as a project Proponent what we’re willing to fund and to initiate are the areas that are directly within our project area.” 4376

Mr. Jones asked if the NGP commitment was “preparation of geographic response plans in the CCAA specifically or is it ... other areas along the tanker routes?” Mr. McHugh said it is for the CCAA.

### **Condensate spills and NGP’s response plans**

Mr. Jones asked if NGP intended to have plans for a condensate spill. Mr. McHugh said, “Absolutely.” Mr. Jones asked if the bulk of condensate would evaporate. Mr. McHugh typified a condensate spill as having “high rates of dispersion and evaporation. It is a volatile product. ... You look at ... issues around human health and safety. Tracking and monitoring. What’s happening to the oil? Are there things that you can do in advance of the oil moving or the slick moving. ... Typically what you’d see is a thin sheen that would spread quite rapidly and evaporate and disperse quite rapidly. You’d start to see much more oil entering the water column and evaporating.” 4396

Mr. McHugh said there are “issues around source control. ... You’re still trying to limit the amount of condensate that’s entering the environment. ... You would do that onboard the vessel, ... transferring between tanks, working with their own systems.” 4409

Mr. Jones asked about health and safety concerns, and specific measures with respect to the potential for toxic vapours at communities such as Kitimat or Kitimat Village. Mr. McHugh replied, “We did undertake a vapour cloud analysis as part of the TERMPOL work, ... by Frank Bercha.” The report found that the radius of potential danger to human health is “actually fairly small and it’s a very limited time window.”

Mr. McHugh referred to the LNG proposals and that both condensate and LNG transport entail vapour risks. Mr. Greg Milne said, “In the event of any spill of petroleum products, be it crude oil or condensate, you would undertake air quality monitoring in that area to identify the potential for any hazardous atmospheres or for exposure to hazardous vapours. ... That ... would be done to the appropriate scale.” 4420

### **Endpoints**

Mr. Jones quoted from [Exhibit B3-37](#), Adobe 47: “At the outset of response operations, the spill management team will propose remediation endpoints for shoreline cleanup. These will be submitted to the [Canadian Coast Guard] and reviewed by the REET, with input from regulatory agencies...” He asked about recent changes to REET, and whether these had changed the approach. Mr. McHugh replied that it has not changed, that REET is the Regional Environmental Emergency Team, a joint program co-led by B.C. and Environment Canada. Mr. Jones asked if there were “no Environment Canada REET personnel in the region.” Mr. McHugh replied that REET had been centralized in Montreal, “for greater efficiency.” 4428

Mr. Jones questioned what it means to set endpoints at the outset, particularly for shoreline contamination. Dr. Owens said, “Shoreline response is a phased approach, ” and that “endpoints” would be better described as “no further treatment guidelines” to reach the response objective. A second phase would have “treatment endpoints.”

### **Who decides the endpoints**

Mr. Jones: “Who would Northern Gateway envisage making the final decision with respect to endpoints?” Dr. Owens: “Recommendations that come from the field survey teams are reviewed in the environmental unit of the spill management team. Those recommendations are passed on to unified command that are passed on for approval by the federal [Coast Guard] monitoring officer, who is advised by REET. The spill management team doesn’t make those decisions themselves.” 4447