

**JOINT REVIEW PANEL FOR THE ENBRIDGE
NORTHERN GATEWAY PROJECT
COMMISSION D'EXAMEN CONJOINT DU PROJET
ENBRIDGE NORTHERN GATEWAY**



**Hearing Order OH-4-2011
Ordonnance d'audience OH-4-2011**

**Northern Gateway Pipelines Inc.
Enbridge Northern Gateway Project
Application of 27 May 2010**

**Demande de Northern Gateway Pipelines Inc.
du 27 mai 2010 relative au projet
Enbridge Northern Gateway**

VOLUME 170

**Hearing held at
Audience tenue à**

**Chances Prince Rupert
240 West, 1st Avenue
Prince Rupert, British Columbia**

**April 25, 2013
Le 25 avril 2013**

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Canada

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and the National Energy Board

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HEARING /AUDIENCE

OH-4-2011

IN THE MATTER OF an application filed by the Northern Gateway Pipelines Limited Partnership for a Certificate of Public Convenience and Necessity pursuant to section 52 of the *National Energy Board Act*, for authorization to construct and operate the Enbridge Northern Gateway Project.

HEARING LOCATION/LIEU DE L'AUDIENCE

Hearing held in Prince Rupert (British Columbia), Thursday, April 25, 2013
Audience tenue à Prince Rupert (Colombie-Britannique), jeudi, le 25 avril 2013

JOINT REVIEW PANEL/LA COMMISSION D'EXAMEN CONJOINT

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- Mr. Darryl Carter

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- Ms. Caroline O'Driscoll

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- Mr. Lawrence Shute
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- Mr. Walter Thorne
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- Mr. David De Wit

- Chief Namoks (John Ridsdale)

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- Ms. Joy Thorkelson

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- Mr. Andrew Hudson

- Ms. Carol Hales

- Ms. Rebecca Brown

- Mr. Asad Chaudhary

- Mr. Neil Patterson

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--- Upon commencing at 7:59 a.m./L'audience débute à 7h59

20815. **THE CHAIRPERSON:** Good morning, everyone. I believe we're ready to get underway.

20816. Do any parties have preliminary matters they wish to raise this morning?

20817. **MS. BIRD:** Good morning, Madam Chair.

20818. Nothing substantive, just to introduce -- they have been sworn in -- Drs. Gwyn Lintern -- they're in the front row next to Mr. John Clarke -- and John Cassidy. They're at the back of the room.

20819. They were sworn in yesterday. They had appeared remotely in Vancouver, and then they hopped on a flight last night and got up here to appear before the Panel this morning.

20820. **THE CHAIRPERSON:** Thank you, Ms. Bird. Welcome, gentlemen.

20821. Seeing no other preliminary matters, I'll just mention for everybody's information that it's the Panel's intention to sit until 4:00 this evening, and so we'll proceed on that basis.

20822. And with that, Ms. Kyle, over to you to continue with your questions, please.

20823. **MS. KYLE:** Thank you, Madam Chair. Good morning. Good morning to the other Panel Members, and to the witness panel.

GEORGE ARMSTRONG: Resumed

ANDRÉE BLAIS-STEVENS: Resumed

CARL BROWN: Resumed

KEVIN CARRIGAN: Resumed

JOHN CASSIDY: Resumed

CAROLINE CAZA: Resumed

JOSEF CHERNIAWSKY: Resumed

JOHN CLARKE: Resumed

KIM CONWAY: Resumed

HEATHER DETTMAN: Resumed

CHRIS DOYLE: Resumed
WAYNE DUTCHAK: Resumed
MICHAEL DWYER: Resumed
MICHAEL ENGELSJORD: Resumed
CHARLES HANSEN: Resumed
GRANT HOGG: Resumed
BRUCE HOLLEBONE: Resumed
ALI KHELIFA: Resumed
ERIK KIDD: Resumed
THOMAS KING: Resumed
GWYN LINTERN: Resumed
LAURA MACLEAN: Resumed
FRANÇOIS MARIER: Resumed
PHIL MURDOCK: Resumed
GLENN ORMISTON: Resumed
DONALD ROUSSEL: Resumed
PAUL TOPPING: Resumed
ROB TURNER: Resumed
SHANE WALTERS: Resumed

--- EXAMINATION BY/INTERROGATOIRE PAR MS. KYLE: (Continued/Suite)

20824. **MS. KYLE:** So I'd like to start by going to Exhibit D72-15-08, Ms. Niro. D72-15-08, and if you could take us to Adobe page 6, please, Ms. Niro.

20825. So if we scroll down to the very bottom of that document, it's an email exchange. Again, this was part of an access to information request package. You'll see that that first email there appears to be from a senior adviser with NRCan.

20826. So Mr. Clarke, I think perhaps my questions are best directed to you on this. If you could just take a look at the first paragraph of that email, at the bottom from Kristi Varangu to Robert Turner. There's a portion redacted, it appears. But if you could read the rest.

20827. Thank you.

20828. And would you agree with me that this email from Ms. Varangu references a meeting with Enbridge in which the tanker -- a west coast tanker issue was an issue up front in their minds? Do you agree that that's what the

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- email refers to?
20829. **MR. JOHN CLARKE:** John Clarke for NRCan.
20830. Yes, that is what the email says.
20831. **MS. KYLE:** And are you aware of concerns expressed by either Enbridge or Northern Gateway Pipelines Partnership about the existence of an oil tanker moratorium and the effect that might have on their proposed project?
20832. **MR. JOHN CLARKE:** John Clarke for NRCan.
20833. No, I'm sorry, I'm not specifically aware of those concerns. Those aren't part of the evidence NRCan filed.
20834. **MS. KYLE:** Well, the evidence that has been filed is that there is no tanker moratorium, and this document links tanker issues with concerns raised by Northern Gateway. So my question is, are you generally aware of any concerns raised by Northern Gateway about a tanker moratorium and the effect it may have on their project?
20835. **MR. JOHN CLARKE:** John Clarke for NRCan.
20836. No, I'm sorry; I was answering your question. I'm here for NRCan to speak to the evidence we filed, and so we didn't file any evidence on Enbridge Gateway's concerns, so I didn't come here ready to talk about Enbridge Gateway's concerns, whatever they may be.
20837. **MS. KYLE:** Madam Chair, I would appreciate if the witness would answer the question. I submit that it is a relevant question.
20838. Of course, the whole issue before this Panel is with respect to the Northern Gateway Pipeline Project, and the evidence that Canada has filed in relation to the tanker moratorium is, of course, with respect to this -- this project.
20839. **THE CHAIRPERSON:** Mr. Clarke, would you please provide an answer to Ms. Kyle's question?
20840. **MR. JOHN CLARKE:** Thank you.

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20841. I'm sorry, Ms. Kyle, I wasn't trying to avoid your question. I think your question was, "Mr. Clarke, are you aware of Enbridge's concerns" and I'm not specifically aware of Enbridge's concerns.
20842. **MS. KYLE:** Okay. And I did hear that answer, and you said "specifically", so my follow-up question was, are you generally aware of concerns raised by Northern Gateway about a tanker moratorium?
20843. **MR. JOHN CLARKE:** It's John Clarke for NRCan.
20844. My level of understanding is what you just had me read in that email.
20845. **MS. KYLE:** Okay. Thank you.
20846. And Mr. Roussel, or anyone else from Transport Canada, are you aware of concerns raised by Northern Gateway Pipelines Project in relation to the existence of an oil tanker moratorium?
20847. **MR. DONALD ROUSSEL:** Yes, we are aware.
20848. **MS. KYLE:** Okay. And can you tell us what those concerns have been, as expressed by Northern Gateway or Enbridge?
20849. **MR. DONALD ROUSSEL:** Well, of course, in general, we are aware of the concerns of Enbridge and the Northern Gateway Project, Madame Chair, regarding the tanker traffic ambiguity, and that's been there for the departments and other department to make sure that we bring clarity on what is this voluntary tanker exclusion zones from the Gulf of Alaska to Juan de Fuca Strait.
20850. And that's what the effort has been for many years, to bring clarity, even against adversity in the public domain where these issues being brought again and again and again.
20851. So we are here in front of you, Madame Chair, to reiterate the status of the voluntary tanker exclusion zone which was put in place exclusively for tanker traffic from the Gulf of Alaska to the Juan de Fuca Strait and there's no other element related to that.
20852. **MS. KYLE:** Thank you, Mr. Roussel.

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20853. And has Transport Canada had discussions with either Enbridge or Northern Gateway Pipelines Project about concerns that Enbridge or Northern Gateway have or had about the possibility that an oil tanker moratorium might exist and might make it difficult to proceed with their project?
20854. **MR. DONALD ROUSSEL:** Mr. Turner will give you a more detail answer.
20855. **MS. KYLE:** Thank you.
20856. **MR. ROB TURNER:** Yes, good morning, it's Robert Turner, Transport Canada.
20857. It might help if I try and explain from Transport Canada's perspective how this issue evolved, to give a sort of background context.
20858. Now, in mid-2005, Mr. Anderson did write Transport Canada and I believe also NRCan at the same time ---
20859. **THE CHAIRPERSON:** Mr. Turner, if we could just have you pull your mic a little closer so that we can make sure we can record your words. Thank you.
20860. **MR. ROB TURNER:** Thank you, sorry about that.
20861. So mid-2005 we received a letter from Mr. Anderson and I understand NRCan received a similar letter and referred to the moratorium on tankers, as has been discussed yesterday.
20862. And that was the first I heard of a moratorium and I've been dealing with navigation safety issues for a while with Transport Canada at that time. It was the first I'd heard of anything of that sort and I endeavoured to find out a little bit more about it. I contacted NRCan and I also talked to our regional office and also the Coast Guard and we found no information related to a moratorium.
20863. All of our ship routing measures are set out in the Canadian Coast Guard Publication that ships are required to carry when they're in Canadian waters, that's in the Annual Notice to Mariners. And in there are both mandatory and voluntary ship routing measures and there's no mention of moratorium in

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there either. And all these routing measures are published by Canadian Hydrographic Service on the charts, so that mariners are aware of these ship routing measures.

20864. So to bring clarity to the situation, we replied that the only routing measure specifically applying to tankers on the west coast was the voluntary tanker exclusion zone. So -- and that had been our line and this is exactly what we are aware of and there was no moratorium that's legislated or under regulations that Transport Canada administers.
20865. So there was some assumption that the tanker exclusion zone may be what people are confusing with this moratorium. And so that's what the clarity we were trying to provide.
20866. Now, with respect to answering the direct question, was that I'm not aware of any discussions or I don't recall any discussions between Enbridge or Northern Gateway Pipeline Projects with Transport Canada on this issue. I only see that here and that's the limit to what I'm aware of in terms of their concern. And I understand that they would be concerned because they would want to get clarity on the situation as well.
20867. Thank you.
20868. **MS. KYLE:** Thank you, Mr. Turner.
20869. So before seeing this letter from Mr. Anderson, I take it that you weren't aware of the Terms of Reference for the Public Review Panel or the Royal Society of Canada Review?
20870. **MR. ROB TURNER:** That's correct.
20871. **MS. KYLE:** And you were not aware of the recommendations of the Royal Society of Canada in relation to maintaining an oil tanker moratorium?
20872. **MR. ROB TURNER:** Correct.
20873. **MS. KYLE:** And you commented, Mr. Turner, that in your view or the view of Transport Canada that there appeared to be confusion in the minds of some -- between the tanker exclusion zone and an oil tanker moratorium; is that a fair characterization of what you just told me?

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20874. **MR. ROB TURNER:** Perhaps just to clarify that there was no confusion on our part and Transport Canada.
20875. **MS. KYLE:** Yes. No, I understood you to mean that there was confusion outside Transport Canada with respect to whether or not the tanker exclusion zone -- between the tanker exclusion zone and an oil tanker moratorium.
20876. **MR. ROB TURNER:** We had received letters concerning the moratorium, so I guess that would be confusion I guess, yes.
20877. **MS. KYLE:** And would you -- sorry, Mr. Roussel?
20878. **MR. DONALD ROUSSEL:** Under -- Canada is -- has ratified UNCLAWS, the United Nations Convention on the Law of the Sea in 2003. There is inside that convention the notion of “innocent passage” within the territorial sea, the contiguous waters and within the EEZ, the Economic Exclusive Zone.
20879. If a country want to -- and that’s what is trying to be projected there -- to ban a type of shipping inside those area, he need to go to an extensive consultation with affected parties. Affected parties are the country that are either using these waters, the EEZ, the contiguous waters 12 to 24 mile, and the territorial sea.
20880. In the voluntary exclusion tanker zone, why it is voluntary is that because we have not enshrined that and we have not engaged into those very extensive discussions on how it will jeopardize, Madame Chair, or penalize parties. And that’s not just the parties who are transporting oil from the Gulf of Alaska to Juan de Fuca, any other parties who want to use those waters for commerce.
20881. So making an assumption that there is a moratorium in the sense of the definitions of a moratorium, which is a complete ban of a type of transportation in an area, is a grossly misleading information and I will leave it to that.
20882. And we are bound as a party to UNCLAWS to engage partners in these matters when it's time to deal with this. So that’s why since 2005, and beyond, we have engage extensively at clarifying, correcting at all level within the

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public domain, within the different piece of legislation that was proposed in Parliament to make it clear that we simply cannot do that from a -- in a simple matter. It's a very complicated matter, Madame Chair.

20883. You have also innocent passage on the east coast where you have tens of thousands of vessels going a few nautical miles from Cap Ray on the great circle routes from Europe. So when you try to do these type of thing it's far beyond then the work orders that we saw as the intervenor present to us, a request for proposal or internal emails or any other type of documentation that's been presented to us since yesterday.
20884. So I will leave it to that, Madame Chair.
20885. **MS. KYLE:** Mr. Turner, did you have something you wanted to say further?
20886. **MR. ROB TURNER:** Yeah, I'd just like to maybe -- I feel I may have to correct the record. I was just trying to search my memory bank as to your question about Enbridge and if they had asked us about a moratorium. And they may have, I'm not sure. I'm thinking that I was at a presentation and they had asked but I can't be certain about that.
20887. **MS. KYLE:** Appreciate that. Thank you, Mr. Turner.
20888. Mr. Turner, I just had a follow-up question to what you told me earlier in relation to the tanker exclusion zone versus the oil tanker moratorium. Would you agree with me that the references to that oil tanker moratorium, in the various documents that we looked at yesterday, all referenced that oil tanker moratorium having been put in place in 1972?
20889. **MR. ROB TURNER:** I recall those documents, yes.
20890. **MS. KYLE:** And would you agree with me that that predates the tanker exclusion zone that was put in place in 1988?
20891. **MR. ROB TURNER:** Yes.
20892. **MS. KYLE:** And it also predates the TAPS routes that we talked about yesterday that were put in place in 1977; correct?

20893. **MR. ROB TURNER:** Yes.

20894. **MS. KYLE:** Yes.

20895. And Mr. Roussel, just going back to what you were telling us, so you said since 2005 there's been an attempt to clarify issues around this oil tanker moratorium question. And so is it fair to say that that has -- that was spurred on by Mr. Anderson's letter raising the moratorium in the context of the Northern Gateway Pipeline Project?

20896. **MR. DONALD ROUSSEL:** Not necessarily, Madame Chair, it's came from different angles where we try to correct in the public, either in the public press or with whatever information we can gather so that we bring clarities to situations that are known that are misleading. And it's been an ongoing battle.

20897. **MS. KYLE:** And Mr. Roussel, you were explaining the international obligations of Canada in relation to safe passage. Would you agree with me that a tanker oil -- sorry, an oil tanker moratorium policy wouldn't necessarily have to be a ban, per se, on tankers -- I'll just give you a moment to read the note that was passed to you.

20898. Sorry, can I just finish my question?

20899. **MR. DONALD ROUSSEL:** Oh, yes.

20900. **MS. KYLE:** I just want to make sure I have your attention while I'm asking my question.

20901. Would you agree that an oil tanker moratorium policy wouldn't necessarily have to be a ban on tankers but could instead be a policy of government not to approve projects that would require the transiting of oil tankers off the west coast of Canada?

20902. **MR. DONALD ROUSSEL:** I disagree, Madame Chair. It's a lot more complicated than that. You have to be extremely precise when you want to infringe innocent passage in the territorial sea, the contiguous water or the EEZ. You need to specifically define for the matter of safety, securities, or other reason that are enshrined on their end loss of what you're trying to do. You cannot just pick and choose. You have to really define, Madame Chair, the -- exactly what you are trying to do.

20903. At this juncture, at this moment, at this exact moment, we can charter a vessel, Madame Chair, a tanker taking up to Kitimat, anchor it, do a photo shot and then leave the area if that vessel met all the international requirement. It may not have a cargo at this juncture but there is nothing we can do to stop that vessel of doing that at this moment.

20904. **MS. KYLE:** But would you agree, Mr. Roussel, that there's a difference between affecting safe passage and permitting a Proponent to construct a marine terminal for the purposes of bringing oil tanker traffic into ports on the west coast of B.C.?

20905. **MR. DONALD ROUSSEL:** No, I disagree with that, Madame Chair. It's a complex issue and it -- and the process regarding if you want to stop a particular project of moving forward or the notion of affecting similar, equal or equivalent type of transportation in the same area, has got the same effect on the ship owners, operators and flag state who will be using those waters.

20906. So the process regarding the consultations is the same. You have to demonstrate what you're trying to do very clearly and then you have to pass the test and the scrutiny of those elements regarding the constraint you want to impose on the flag state, which is the country you have registered those ships, the ship owners, the shippers and the overall operations you're trying to restrain, the type of ship you're trying to restrain.

20907. Mr. Turner?

20908. **MR. ROB TURNER:** I would just add that in -- for several years there have been petroleum products being moved by tanker in and out of Kitimat, tankers up to 50,000 deadweight tonne, I understand.

20909. **MS. KYLE:** Would you agree with me, Mr. Roussel, though, that it wouldn't affect or be contrary to the obligations of safe passage if a government decided not to approve a project that required the use of oil tankers to come in and out of Canadian ports?

20910. **MR. DONALD ROUSSEL:** Madame Chair, I mean that's the role of the Panel to make the recommendations regarding the going forward of a project or not.

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20911. I'm here to explain you the constrain if you try to have a moratorium or try to impose it via the mechanism that we are enshrined with, which is the ratification of UNCLAWS, an innocent passage and any other consultations we will need to make to make this happen. So I'm not in a position to answer really to the constructions of a terminal or other elements really to this particular project.

20912. We're looking at shipping and navigation and Transport Canada, our testimony here is, of course, on this particular project, but in more in general, Madame Chair, preserving shipping and navigation in this country in accordance with international instruments that we have also ratified as a country. We are the custodian of that, Transport Canada is the marine administrations and we are the main regulators when it comes to implementations of international instrument.

20913. **MS. KYLE:** Thank you, Mr. Roussel.

20914. I wasn't suggesting that Transport Canada would have any veto power over this project. It is in the hands of the Joint Review Panel to make a recommendation and ultimately, governor-in-council to make a decision.

20915. My question was, would you agree that, if Canada decided not to approve a project that required oil tankers to be within Canadian waters, and to come in and out of Canadian ports, that that would not be inconsistent with the obligations in relation to safe passage?

20916. **MR. DONALD ROUSSEL:** I disagree. It will be inconsistent with international instrument.

20917. **MS. KYLE:** So you're saying that if Canada decides not to issue a Certificate of Public Convenience and Necessity for this project that that would be contrary to the international obligations in relation to safe passage?

20918. **MR. DONALD ROUSSEL:** Based -- Madame Chair, based on the -- if the decision is based on excluding tanker traffic, that will be contrary to international instrument without proper consultations with other parties that will be affected by these type of decisions.

20919. **MS. KYLE:** If it was based on environmental concerns about the risks associated with oil tankers, would you still maintain your position on that?

20920. **MR. DONALD ROUSSEL:** Madame Chair, there's a full process

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regarding the mechanisms of how you can restrict innocent passage and these things need to be dealt with in appropriate time under the appropriate forums.

--- (A short pause/Courte pause)

20921. **MR. DONALD ROUSSEL:** Madam Chair, I want to make sure that we all hear the same thing that I have said.

20922. **MS. KYLE:** So I just want to make sure that I understand this as well.

20923. Do the other representatives of Transport Canada agree with what I interpreted Mr. Roussel saying, is that, if Canada decided not to approve this Project because of concerns about oil tanker traffic that that could be contrary to international obligations in relation to safe passage?

20924. And, Mr. Roussel, if I'm incorrect in characterizing what you said, please let me know.

20925. But would the other Transport Canada members agree with that?

20926. Oh, sir, your microphone.

20927. **MR. DONALD ROUSSEL:** Sorry, Madam Chair.

20928. Yes, I think that the -- the thing that's got to be clear, the Project can go ahead or not go ahead which is the decisions of this Panel.

20929. What's need to be disjoint is the innocent passage of ships in Canadian -- well, in territorial seas in the contiguous waters up to 24 miles and within the EEZ.

20930. And what I mentioned to this particular Panel this is not to this Panel to decide on these matters. It is to the Government of Canada to appropriate consultations with other parties which will be affected countries who have ratified those instruments into how we want to -- if it is the decisions, how we want to restrain or limit type of traffics within our EEZ, contiguous waters and territorial sea.

20931. **MS. KYLE:** Thank you, Mr. Roussel.

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20932. Mr. Turner, would you agree that it would not be inconsistent with the international obligations in relation to safe passage for Canada to decide not to approve a project because of environmental concerns about oil tanker traffic?
20933. **MS. ANDERSON:** Madam Chair, if I might interject?
20934. I believe this question has been asked and answered, and asked and answered again.
20935. We've been quite patient and respectful of the ruling that the Panel made yesterday to allow questions on this topic as they're related to the evidence filed by Transport and NRCan.
20936. We do note as well though, that in Panel Ruling 86, the Gitxaala Nation had sought further and better answers to IR1.12 which was with respect to the evidence filed on the voluntary tanker exclusion zone and the moratorium on oil and gas exploration and the Panel ruled that the answers given by Canada are clear and that there was no basis to provide further information on that.
20937. The testing of that evidence has now gone on for several hours with the same questions being asked and answered and I'm, on that basis, objecting to this further line of questioning.
20938. **MS. KYLE:** Thank you, Madam Chair.
20939. I don't believe Mr. Roussel actually did answer the question about the environmental concerns specifically. I think his answer was that there are a number of factors that would have to be taken into account.
20940. So he wasn't really able to answer that question that I had posed in relation to the environmental concerns with oil tanker traffic and whether that would be a factor that related to safe passage issues. And so, as a result of that, I put the question to Mr. Turner to get his views on that question.
20941. With respect to the other submissions of my friend, she did make the objection yesterday about my ability to test the evidence in relation to the tanker moratorium and I believe that issue was resolved yesterday by the Panel.
20942. **MS. ANDERSON:** Yes, Madam Chair, sadly, I was not quite as

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prepared as my friend yesterday when we discussed that objection and so I am now just bringing to the Panel's attention Ruling 86 which I did not raise yesterday.

20943. **THE CHAIRPERSON:** Thank you, Ms. Anderson.

20944. The Panel was aware of its Ruling 86 and thank you for reminding us about it.

20945. Ms. Kyle, can we ask you how much more -- how many more questions you have in this line of questioning?

20946. **MS. KYLE:** I'm sure people will be -- especially those on the Panel -- glad to know that I only have about four or five more questions on this issue.

20947. Sorry, I should say depending on the answers that are provided and how many follow-up questions I have to ask.

20948. **THE CHAIRPERSON:** Ms. Kyle, the Panel encourages you to go directly to the remaining questions that you have and to pose your questions in a way that the witness who is best able to answer the question provides that answer rather than targeting specific people within departments and that sort of thing.

20949. So if you would just go directly to the remaining questions you have in this area, it would be most helpful to the Panel.

20950. **MS. KYLE:** Absolutely, Madam Chair.

20951. May I just clarify though: Can I pose that question about the environmental issues and the safe passage issue to the Panel generally?

--- (A short pause/Courte pause)

20952. **THE CHAIRPERSON:** Ms. Kyle, I believe that there's already been at least a partial answer to the question so I would invite the witness panel to add anything additional to the question that you'd posed.

20953. **MS. KYLE:** Thank you, Madam Chair.

20954. Shall I restate the question?

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20955. **THE CHAIRPERSON:** That's typically helpful, thank you.

--- (Laughter/Rires)

20956. **MS. KYLE:** Yes, if I can remember it.

20957. So the question, Panel, was that -- the position I put forward or the proposition I put forward was that it would not be contrary to the obligations of safe passage for Canada to decide not to approve a project because of environmental concerns associated with oil tanker traffic?

--- (No response/Aucune réponse)

20958. **MS. KYLE:** Nothing? Okay, thank you.

20959. Ms. Niro, if we could turn now to Exhibit D72-15-47? And that's Adobe page 17, please.

20960. So again, these are documents from an Access to Information request. They're media lines in relation to the Enbridge Gateway Project.

20961. I'm not sure who on the Panel would be best suited to answer my questions so I'll just pose them generally and perhaps someone from Transport Canada or NRCan could respond?

20962. I'd like to just have the witness panel review the -- the first paragraph under "Issue"; and then, under "Media Lines", the third bullet.

20963. And my question is: Would you agree with me -- well, firstly, my question is: Are you aware that Canada, from time to time, has issued media lines in relation to the proposed Northern Gateway Pipeline Project? Let's start generally.

20964. Perhaps Mr. Clarke or Mr. Roussel?

20965. **MR. JOHN CLARKE:** It's John Clarke from Natural Resources Canada.

20966. I'm sorry but what do you mean by "issue media lines"?

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20967. **MS. KYLE:** So -- or prepared -- I shouldn't say "issued" -- have prepared media lines in relation to the Northern Gateway Pipeline Project.
20968. **MR. JOHN CLARKE:** It's John Clarke for NRCan.
20969. That does seem to be what you've put on the screen here, yes.
20970. **MS. KYLE:** Yes, and those media lines, would you agree with me, in relation to the Northern Gateway Pipeline Project, have addressed issues with respect to a tanker moratorium?
20971. **MR. JOHN CLARKE:** It's John Clarke for NRCan.
20972. You've put one media line set up on the screen here. It addresses the tanker exclusion zone but not a tanker moratorium, to the best that I can see anyway.
20973. **MS. KYLE:** And Mr. Roussel, are you aware of media lines that address the tanker exclusion zone or oil tanker moratorium in the context of the Northern Gateway Pipeline Project?
20974. **MR. DONALD ROUSSEL:** Well, we do prepare media line in general, and in particular to this project probably have done so.
20975. **MS. KYLE:** And would you agree that in at least this media line there is an attempt to -- I think you used the word "clarify" -- clarify Canada's position with respect to the tanker exclusion zone?
20976. **MR. DONALD ROUSSEL:** It's been our continuous effort to clarify this element.
20977. **MS. KYLE:** I'd like to now go to Exhibit D72-16-12. And Ms. Niro, I wanted to go to Adobe page 13 in that document please.
20978. So this appears to be a briefing note entitled "Tanker Traffic off the B.C. Coast". And unfortunately we don't know from this document that was provided in the access to information request materials what ministry. But perhaps we'll start with you, Mr. Roussel, if you could just read the subject line of that briefing note and the first two bullets in that briefing note.

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20979. **MS. ANDERSON:** Madam Chair, I wonder if it might be of more fairness to the witnesses before asking them questions about the document to establish whether or not they are even familiar with the document.
20980. **MS. KYLE:** I'm in your hands, Madam Chair.
20981. **THE CHAIRPERSON:** Ms. Anderson, this has been filed as evidence, and so I believe that the witnesses, in their review, should be familiar with all the material on the record.
20982. **MS. ANDERSON:** It has not been filed as evidence of the Government of Canada. It's filed as evidence by -- I think it's Gitxaala Nation, this particular package, I'm not sure. And so my meaning isn't if are they generally familiar that this document has been filed but are they personally familiar with the document to the extent that they can answer questions on it.
20983. **THE CHAIRPERSON:** I would expect that if the witnesses weren't familiar they would make sure that the Panel knew that so that we would understand the context under which they were providing their answers.
20984. **MS. KYLE:** Thank you, Madam Chair.
20985. So, Mr. Roussel, if you could to read, as I asked previously, the subject and then under "Proposed Response" the first two bullets there please. Thank you.
20986. And would you agree with me that this document relates to providing information to, it appears, a minister -- and actually, Ms. Niro, if you could just scroll down, in the left-hand corner there it will say "Minister's Version". Yes.
20987. And if you could scroll back up again, Ms. Niro. Thank you so much.
20988. So would you agree that this appears to be -- to provide information to a minister concerning opposition to tanker traffic off the B.C. coast and the relationship to the Enbridge Gateway Pipeline Project?
20989. **MR. DONALD ROUSSEL:** That's a document that is addressed to the ministers, yeah.

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20990. **MS. KYLE:** And the first two bullets discusses that there's a moratorium on oil and gas activities but the moratorium does not include tanker traffic, and the second bullet talks about the voluntary tanker routing measure.
20991. I take that those two comments reflect what you've been telling us in your testimony to date?
20992. **MR. DONALD ROUSSEL:** Yeah, this is clear.
20993. **MS. KYLE:** And if we can just turn the page, Ms. Niro, to page 14.
20994. And Mr. Roussel, if you could just read the first paragraph there under "Background Advice for Minister".
- (A short pause/Courte pause)
20995. **MS. KYLE:** Thank you, Mr. Roussel.
20996. Would you agree that in that first paragraph there's references to Aboriginal groups and environmental NGOs that have commented in the media and in letters to the government that there's a longstanding federal policy on oil tanker movements and that this has been an argument as to why the Northern Gateway Pipeline Project could not go ahead?
20997. **MR. DONALD ROUSSEL:** Madame Chair, that's an advice to ministers following a review of -- normally a review of press, media and so forth, so that's what's reflected in that paragraph.
20998. **MS. KYLE:** And Mr. Roussel, are you aware that First Nations and Aboriginal organizations have raised concerns about an oil tanker moratorium and how that might apply to the Northern Gateway Pipeline Project?
20999. **MR. DONALD ROUSSEL:** Yes, we are aware of that.
21000. **MS. KYLE:** And has Transport Canada had any consultation with First Nations about that issue and those concerns?
21001. **MR. DONALD ROUSSEL:** The formal consultation projects, Madame Chair, for this particular project is under this Panel. We have approached and we have spent a significant amount of time however in

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preparatory work in the departments with First Nations, having our own staff going around the different First Nations communities, helping them at understanding the process that will be underway under the NGP.

21002. We can report back to this Panel that for the past, at least two years, our staff in the Pacific has been in villages, have been with the different communities in helping them at moving forward and using the forum that will be this particular Panel to deal with the consultations on this particular project. So that's the effort we have made at the department at this juncture.

21003. **MS. KYLE:** Would you agree that you haven't met with Gitxaala Nation on the oil tanker moratorium issues?

21004. **MR. DONALD ROUSSEL:** It appears that we have not met specifically with Gitxaala.

21005. **MS. KYLE:** Thank you.

21006. And if you could -- Ms. Niro, if we could scroll down to the fourth paragraph in that briefing note, starting out, "There have also been references to the conclusion".

21007. And again, Mr. Roussel, if you would read that paragraph please?

--- (A short pause/Courte pause)

21008. **MS. KYLE:** Thank you.

21009. And would you agree with me that in that paragraph the briefing note indicates that people who have been raising these issues about the oil tanker moratorium had been referring to the Royal Society of Canada's science report for the federal government but that the Royal Society of Canada went beyond its mandate in addressing tanker traffic in its conclusions; would you agree that that's what this says?

21010. **MR. DONALD ROUSSEL:** That's what's written in this paragraph, Madame Chair.

21011. **MS. KYLE:** Thank you.

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21012. And would you agree though that that actually is not a correct statement?
21013. **MR. DONALD ROUSSEL:** Could you repeat your question?
21014. **MS. KYLE:** Yes, absolutely. Would you agree that that's not a correct statement that the Royal Society of Canada went beyond its mandate given the Terms of Reference that we looked at yesterday for the Royal Society of Canada that specifically referred to the oil tanker moratorium?
21015. **MR. DONALD ROUSSEL:** Thank you, Madame Chair.
21016. It appears that this particular paragraph is information that came from the MPMO office and NRCan input to this particular document. That's the information I got.
21017. **MS. KYLE:** Mr. Clarke?
21018. **MR. JOHN CLARKE:** I'm sorry, just to clarify -- John Clarke for NRCan.
21019. To clarify, it did come from staff within Natural Resources Canada but I suspect predates the Major Project's Management Office that Donald Roussel referred to but it does appear to be a Natural Resources Canada briefing note from the names at the bottom.
21020. **MS. KYLE:** That's helpful. Thank you, Mr. Clarke.
21021. So I'll pose my question to you: Would you agree -- actually, I'll give you a moment, I don't know if you've read that paragraph -- the fourth paragraph but I'll give you a moment to read it.
21022. **MR. JOHN CLARKE:** I've read it, thank you.
21023. **MS. KYLE:** Okay. Thank you.
21024. So my question is: Would you agree with me that the statement in this briefing note that the Royal Society of Canada went beyond its mandate in addressing tanker traffic in its conclusion, is not a correct statement given the references in the terms of reference for the Royal Society of Canada that we

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looked at yesterday that refers specifically to an oil tanker moratorium?

21025. **MR. JOHN CLARKE:** I am very sorry, Ms. Kyle, I haven't reviewed the entirety of the terms of reference for the RSC or the Royal Society of Canada report.
21026. I know we looked at some excerpts yesterday that had some information about moratoria -- I think you pointed out the plural -- in a background statement but I don't frankly recall the details of the Royal Society of Canada's terms of reference.
21027. **MS. KYLE:** Okay.
21028. Well, let's go back to those terms of reference and, if you just bear with me for one moment.
21029. I think, Ms. Niro, that is in the first aid to questioning that Gitxaala forwarded on Monday.
21030. **THE CHAIRPERSON:** Ms. Kyle, could you help the Panel understand the continued relevance of this line of questioning beyond what has already -- what you've already questioned on?
21031. **MS. KYLE:** In my submission, Madam Chair, there is a serious question about the accuracy of the statement that there is no tanker moratorium given the Federal Government documents that have been filed on the record.
21032. There are certainly many inconsistencies and this is an issue that First Nations have raised as a concern that, if there is an oil tanker moratorium, even if that is just a policy, that that is a consideration for the Joint Review Panel to take into account for the Governor in Council to take into account in deciding whether or not it is appropriate to issue approvals for this Project without revisiting that moratorium.
- (A short pause/Courte pause)
21033. **THE CHAIRPERSON:** Ms. Kyle, based on the questioning that you have done to date, the Panel believes it has a complete understanding of this situation and doesn't believe that it needs further questioning in this area.

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21034. **MS. KYLE:** Thank you, Madam Chair.
21035. I'll just check my notes. Is the position of the Joint Review Panel that I am not permitted to ask any more questions about the tanker moratorium issue to this Panel?
21036. **THE CHAIRPERSON:** At this point, we don't believe it's necessary to delve back in through the terms of reference of the Royal Society of Canada report.
21037. So if you have further questions that go beyond that aspect of things and the sentence that you were looking at in the advice to the Minister, let's try those questions.
21038. But this particular line of questioning, the Panel doesn't need to hear any further on.
21039. **MS. KYLE:** Thank you, Madam Chair.
21040. **THE CHAIRPERSON:** Thank you.
21041. **MS. KYLE:** And I'm just wondering, because I can't recall with the large number of witnesses, is there a representative here from Aboriginal Affairs Canada?
21042. I know there was initially someone on the list but I'm not sure if there still is.
21043. **MS. ANDERSON:** Madam Chair, Mr. Eric Magnuson from Aboriginal Affairs was originally scheduled to be on this Panel. He's now appearing on Panel 3 instead, as it's Issues of Emergency Management on Reserves that he'll be dealing with.
21044. **MS. KYLE:** Okay, thank you.
21045. I would like to just look at one more exhibit and just see if anyone on the Panel can answer my questions and that is Exhibit D72-25-04 and that's at Adobe page 14, Ms. Niro.
21046. So this is a memorandum for Minister Prentice dated May 11, 2006.

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21047. Can anybody on the Panel confirm my understanding that Mr. -- sorry, Minister Prentice was Minister of Indian Affairs in 2006?

21048. Yes? I see some nodding heads.

21049. Could somebody just provide an answer to that question if you're -- if you know the answer?

21050. **DR. CAROLINE CAZA:** This is Caroline Caza for Environment Canada.

21051. I believe he was the Minister at that time.

21052. **MS. KYLE:** Thank you.

21053. And there's a reference here in "Background" to a meeting request to talk about the Enbridge Gateway proposal. And if we can go over to -- I believe it's page 16.

21054. So this appears to be the actual briefing note for Minister Prentice in relation to the upcoming meeting with Patrick Daniels, President and CEO of Enbridge. And if we turn over the page, to page -- I believe it's 18, Ms. Niro -- and if I could ask the Panel to read the first two paragraphs under the heading "Tanker Traffic"?

--- (A short pause/Courte pause)

21055. **MS. KYLE:** And, Mr. Clarke, perhaps I'll start with you. I realize that you're not with Aboriginal Affairs Canada but if you can answer the questions, I'd appreciate it.

21056. Just to clarify, first, what the document says, would you agree that, again, this document's referencing concerns about Aboriginal groups about a tanker moratorium and how that might affect the Gateway Pipeline Project?

21057. **MR. JOHN CLARKE:** Sorry, it's John Clarke. I was still reading over it a second time.

21058. Could you just repeat your question, please?

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21059. **MS. KYLE:** Absolutely. I'm happy to.

21060. So would you agree that, in this briefing note, there's a reference to concerns being raised by Aboriginal groups about the existence of an oil tanker moratorium and the effect that might have on the Gateway Pipeline?

21061. **MR. JOHN CLARKE:** It's John Clarke for Natural Resources Canada.

21062. I think that's a fair summary of that first paragraph anyway.

21063. **MS. KYLE:** Thank you.

21064. And then, in the second paragraph, would you agree that the briefing note to the Minister indicates that the assertions about the oil tanker moratorium are inaccurate?

21065. **MR. JOHN CLARKE:** John Clarke for Natural Resources Canada.

21066. Yes, those are the first four words there.

21067. **MS. KYLE:** And to your knowledge, has NRCan had any consultation with First Nations about the -- their concerns about oil tanker moratorium?

--- (A short pause/Courte pause)

21068. **MR. JOHN CLARKE:** I'm not -- it's John Clarke for Natural Resources Canada.

21069. I'm not specifically aware of consultation on that topic. However, I really only have knowledge of NRCan's role with respect to the Enbridge Northern Gateway Pipeline process. So, you know, I can't really answer your question to, you know, with any meaning as to what activities NRCan may have taken out over the last 10 years in regards to tanker traffic. I suspect since NRCan's interests are restricted to the offshore oil and gas activities that that would be the extent of things we would speak to folks about.

21070. **MS. KYLE:** Fair enough, Mr. Clarke.

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21071. Though in those consultations that you refer to in relation to the Northern Gateway Pipeline Project, have there been any discussions around the concerns that have been raised specifically about the oil tanker moratorium question?
21072. **MR. JOHN CLARKE:** Mr. Roussel referred to -- there were meetings between federal officials and First Nations, an information exchange session before these panel hearing started. NRCan officials did attend some of those sessions as part of the whole government approach which Panel 4 will of course explain in better detail.
21073. I do know that NRCan officials did attend -- I do know that NRCan officials did attend meetings where issues related to tanker safety and tanker safety were raised and those aren't issues within our mandate. And there were also issues raised at those meetings in areas that are within our mandate and reflect our areas of technical expertise and we do certainly take good note of those and that informs the advice we provide to the Review Panel here.
21074. **MS. KYLE:** Thank you, Mr. Clarke.
21075. And at those meetings that you're referencing, was there any explanation as to why, in the words of this briefing note, the concerns about the tanker moratorium being, why Canada took the position that those comments were inaccurate?
21076. **MR. JOHN CLARKE:** I don't know everything that was said at all the meetings that were had. My expectation would be if anyone was going to speak about the tanker exclusion zone however, that would be Transport Canada or the Coast Guard or an official that had expertise or knowledge of Canada's transportation legislation. NRCan isn't the competent department to talk about that.
21077. **MS. KYLE:** But you don't recall at any of these meetings that you attended there being any explanation provided to First Nations about why Canada was taking the position that their concerns about the tanker moratorium were based on inaccurate information?
21078. **MR. JOHN CLARKE:** I'm sorry; to be clear I didn't attend any meetings. There were members of my staff who attended those meetings and so I

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- get notes of those meetings and so I'm aware of -- from those notes, the higher level issues that are raised and I'm aware of the issues specific to NRCan's mandate that are raised.
21079. But again, if you had raised or if any party had raised issues about a tanker moratorium, that's not the evidence that we were -- you know, that wasn't the evidence we were -- that wasn't part of our technical review, so it doesn't show up in my notes. But that doesn't mean it wasn't discussed.
21080. **MS. KYLE:** Fair enough.
21081. And Mr. Roussel, can you provide any assistance with that, whether or not at these meetings Canada provided information or an explanation as to why they took the position that First Nations' concerns about the oil tanker moratorium were based on inaccurate information?
21082. **MR. DONALD ROUSSEL:** Which meeting you're referring to?
21083. **MS. KYLE:** Any meetings that you're aware of. You referred earlier in your testimony to various meetings having taken place with First Nations.
21084. **MR. DONALD ROUSSEL:** The goal of the meeting that did take place were to ensure that the First Nations were aware of the process and they would be able to move forward and make meaningful representations under the appropriate forums, Madame Chair, so that was the main goal.
21085. The duty to consult and the obligations to consult with the First Nations will be taking care of under a whole of government approach and I think Panel 4 will be dealing with those matters.
21086. So all our preliminary work with the different First Nations organizations was to helping them at making sure that they will be able to present under the appropriate forum their concerns.
21087. **MS. KYLE:** So to your knowledge, Transport Canada hasn't had discussions with First Nations to explain why Canada takes the position that the concerns that First Nations have raised about a tanker moratorium are based on inaccurate information, to your knowledge?
21088. **MR. DONALD ROUSSEL:** Okay, no, that was not the goal at those

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junctions, it was more on -- with different organizations that also went around, like the Pilotage Authority -- the Pacific Pilotage Authority, other group also went around in different First Nations community to explain the entire regime regarding safety to navigations.

21089. But we have not engaged specifically other than under the TERMPOL process review on some of the elements regarding the tanker safety passage.

21090. **MS. KYLE:** And just to clarify, Gitxaala was not involved in those discussions around the TERMPOL process; correct?

21091. **MR. DONALD ROUSSEL:** Correct.

21092. **MS. KYLE:** All right. Well I appreciate very much the cooperation of the witnesses, thank you so much for your time.

21093. Madam Chair, those are my questions.

21094. **THE CHAIRPERSON:** Thank you very much, Ms. Kyle.

21095. We'll call next Douglas Channel Watch.

--- (A short pause/Courte pause)

21096. **THE CHAIRPERSON:** Just as we're doing the change out of the parties, Ms. Niro, if we could have an AQ number please for the Gitxaala Nation's questioning of this Panel?

21097. **THE REGULATORY OFFICER:** That will be AQ80 -- sorry, just a sec here, AQ90.

21098. **THE CHAIRPERSON:** Thank you, Ms. Niro.

**---AID TO CROSS-EXAMINATION NO./AIDE AU CONTRE-
INTERROGATOIRE No. AQ90:**

*Gitxaala Nation - Aids to cross-examination of the Government of Canada
Panel 2*

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--- (A short pause/Courte pause)

21099. **THE CHAIRPERSON:** Good morning, Mr. Shannon.

21100. **MR. SHANNON:** Thank you and good morning, everybody.

21101. My partner today will be the laptop to my left, so ---

--- (Laughter/Rires)

21102. **MR. SHANNON:** Our other member is on holiday at the moment so I'll carry on.

21103. **THE CHAIRPERSON:** So please begin with your questions of this panel.

21104. **MR. SHANNON:** Okay, thanks.

--- **EXAMINATION BY/INTERROGATOIRE PAR MR. SHANNON:**

21105. **MR. SHANNON:** So while this is not direct evidence of the government, I have some questions that should the project go ahead, I'd like to ask some questions of Environment Canada who would no doubt have some input to the additional environmental monitoring stations that would be required in the CCAA.

21106. First I'd like to ask a few questions about the existing environmental monitoring stations set up in the CCAA by Hayco Consultants for Northern Gateway. If we could please go to B17-19, Adobe page 12. And it would probably help if you make that about 75 percent. Thank you.

21107. So what the figure shows is six environmental monitoring stations, the GEM stations set up by Hayco in the Douglas Channel to complement Environment Canada, DFO buoys in the area. So if we count, starting with the north end of the channel down, we have Emilia Rock, Kersey Point, Dorothy Island, Wright Sound, Fawcett Point and Wall Island. That's in addition to the buoys that are also in the areas.

21108. Could we please now go to Adobe page 36? Now, this is a setup at Kersey Point, and if we could zoom in on the top picture of that.

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21109. I've got a pointer here I hope I don't take anybody's eyes out.

--- (Laughter/Rires)

21110. **MR. SHANNON:** So there's the 10-metre tower on top of which is the anemometer and other environmental monitoring gear.

21111. So my question is what comments would Environment Canada folks have about the validity of this particular weather station?

21112. **MR. CHRIS DOYLE:** It's Chris Doyle with the Meteorological Service of Environment Canada.

21113. Could I ask you to sort of clarify what you mean by "validity"?

21114. **MR. SHANNON:** I notice a forest in the background and this is a 10-metre tower. I can't do the scale of the trees in the background very well but they appear to me to be, in the order of -- if that's 10, by the layout of the photo I would estimate that the treetops are in the area of 20 to 30 metres away and not very far distance. So I'm worried about the proximity of the obstructions to that weather tower.

21115. **MR. CHRIS DOYLE:** It's difficult to locate weather stations in areas of complex terrain like the Douglas Channel area, and there is always going to be compromises.

21116. So when you locate a weather station at sort of an exposed point like this, you're going to get a good reading of wind from a number of directions that are not obstructed by forestry or by trees. And when the wind comes from the other direction of course there will be probably reductions in the wind speed due to the obstructions by the trees themselves. So it's not perfect but very few Environment Canada stations across the country are perfectly located for every weather variable.

21117. **MR. SHANNON:** So you wouldn't probably get accurate wind speeds from all corridors on this one?

21118. **MR. CHRIS DOYLE:** I agree you may not, but you may get accurate wind speeds in the case of this station for winds that are significant in the

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Douglas Channel area, specifically the outflow winds that occur there.

21119. **MR. SHANNON:** Yes, outflow winds would be directly impinging on that. But I'm concerned as well with the nature of the obstruction in the background splitting the flow as it would in a creek or river for example. So I'm questioning the validity of both inflow and outflow winds measured to that station.
21120. **MR. CHRIS DOYLE:** We had an expert in the siting of weather stations. A technician of 30 years-experience reviewed the locations and setting of all the stations put in the Douglas Channel area by the Proponent. And he is in the process of developing a station classification system for a world meteorological organization, and so as sort of an exercise to use this draft classification system to evaluate the quality of all the stations located by the Proponent, it's a scale of one to five where one is essentially a perfect exposure and five produces relatively worthless data.
21121. And nearly all the Proponent stations landed around a three, so they weren't perfectly sited but they were probably adequate to represent the weather of that particular location in the Douglas Channel area. By adequate I mean we would -- using a similar station of Environment Canada's, we would accept the data that the station produced.
21122. **MR. SHANNON:** How -- what mathematical methods would be used to -- what's the word -- mathematically adjust, for example, the underestimate of a wind speed measured in a three -- you measured -- you said a three?
21123. **MR. CHRIS DOYLE:** I don't think there is a mathematical technique per se. It was really just based on how close obstructions are to, for example, the anemometer.
21124. **MR. SHANNON:** You mentioned five -- was it on a scale of five these -- some of these were a three; is that the impression I get?
21125. **MR. CHRIS DOYLE:** Yes.
21126. **MR. SHANNON:** So what would a five do for you relative to that? This is the first thing I've heard of this so I'm just exploring it with you.
21127. **MR. CHRIS DOYLE:** Sure. A five would mean there was probably

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- 360 degree obstruction of the anemometer at a height near or above it.
21128. **MR. SHANNON:** Okay. Thanks.
21129. Going on to a slightly different topic now, got to turn the page. Could we have E11-3-2 please? Again I guess 75 percent works best for me here.
21130. This is Transport Canada's review of the TERMPOL document which evaluates both mandatory and voluntary measures for the Northern Gateway Project. Adobe item -- no, Adobe page 48, which is what we're on, Item 63 -- let's see, it's the -- "Tanker must have English-speaking officers", that's the bullet four -- four bullets down.
21131. Would you consider this to be sufficient communication guidelines for the entire crew? This is Transport Canada I suppose.
21132. **MR. DONALD ROUSSEL:** Thank you, Madame Chair.
21133. Within the international conventions that Canada has ratified, the STCW convention, the Standard Training, Watchkeeping and Certificate Conventions require that the ship officers are able to operate or be fluent in the English language. So that's what this recommendation talks about.
21134. **MR. SHANNON:** Okay. Thank you.
21135. Could we have C202-1 please? Again I guess about a 75 percent. Page 2, please -- yeah, okay -- Item 5.5.
21136. It's a lot of words single-spaced, which is kind of difficult to read, but the portion I wanted to highlight here -- this is an extraction from the National Transport Safety Board's analysis of the Cosco Busan incident in 2007.
21137. With a series of misdirectives, which I won't go into, the container ship collided with the bridge abutment of the Oakland San Francisco Bay Bridge, spilling 1,100 tonnes of fuel oil into the bay. While it's not a tanker it is a container ship and the item identifies some things that reference my previous question.
21138. What was found in the transport safety -- National Transport Safety Board's findings was that the Asian crew on board was -- what the finding was,

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was the crew was baffled by the safety manual which was previously provided in English and it wasn't their working language. So apparently, in this situation, they've -- the officer's grasp of English wasn't adequately conveyed to the crew which gave rise to future confusion -- further confusion with the spill.

21139. Would it not be a good idea to have port safety manuals issued for mixed language tanker crews, particularly in our north coast region, in the working language of the crew?

--- (A short pause/Courte pause)

21140. **MR. ROB TURNER:** Could you just repeat that question then please?

21141. **MR. SHANNON:** I had a hard time developing it.

--- (Laughter/Rires)

21142. **THE CHAIRPERSON:** Mr. Shannon, I think you just need to repeat the last portion of what you said, the aspect of -- you know, the question itself as opposed to the preamble.

21143. **MR. SHANNON:** Okay. Would it not be a good idea as a requirement for the project, should it go ahead, to have a port safety manual issued in the language of the crews operating these tankers?

21144. There are many different languages on board as you are no doubt aware so my concern was that because there was confusion in the Cosco Busan's situation because the crew was not sufficiently informed of the safety manual by the English-speaking officers, would it not be a good idea to have a port safety manual in the various languages for the crews that would come to the north coast.

21145. Sorry, that's even a longer question than before.

21146. **MR. ROB TURNER:** Just before I respond to that, you're referring to the port safety manual. Is this -- which manual is this? Is this the ship's manual or some other manual? Here they're talking about I believe a ship's manual -- a ship's safety manual, but do you know which manual ---

21147. **MR. SHANNON:** The details were given in the Transport Safety

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Board's findings which I don't have at my elbow, but it could have been the ship safety manual.

21148. **MR. ROB TURNER:** Off the top of my head, to hopefully answer your question, under the Safety of Life at Sea Convention, Chapter 5 has to do with the safety of navigation and within that chapter is a regulation concerning the language of the vessel.

21149. And as best as I can recollect, if I can try and paraphrase the essential elements, is that every ship has to have an established language for that ship as a common communication language, and as far as I can recall, if that language -- if the language is different than the flag of the ship, then the documents must be provided in that working language for the ship.

21150. And as Mr. Roussel referred to in the -- from the STCW convention, the regulation in Chapter 5 also does say that the communications amongst the bridge team shall be in English between the bridge team and pilot or between the ship and the shore, unless everyone concerned speaks a common language. So the default would be English for any sort of navigational directions.

21151. And to facilitate this, there is a document that's been developed by the International Maritime Organization. It's called the Standard Marine Communication and Phrase Book, and this captures the sort of common commands that one might expect for keeping a navigational watch and following directions.

21152. I hope that answers your question.

21153. **MR. SHANNON:** Thank you.

21154. Will it be a proviso for accepting a tanker into the area that the crew is apprised of its safety manuals in its language?

21155. **MR. ROB TURNER:** Well, like I said, it's a requirement now under the Safety of Life at Sea Convention which the vessel will be certified in and it's also that same requirement is reflected in our own regulations under the *Canada Shipping Act* navigation safety regulations. I can't recall the actual number of the regulation, so that would be a requirement.

21156. **MR. SHANNON:** Okay, thanks.

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21157. Shifting to another topic -- can you hear me? Is that loud enough? Have I pushed it away further?
21158. Okay, could I have aid to questioning DCW AQ10, please?
21159. Has everybody had a chance to review this? I issued it 36 hours ago, I think. I'm not a lawyer. Is that okay with everyone? Have you read it?
21160. **DR. HEATHER DETTMAN:** Yes.
21161. **MR. SHANNON:** Okay. Shown here is an analysis of the various dilbits from the crude oil monitor. It's a summary showing a range of products from the oil sands and would be potential candidates for the Northern Gateway pipeline from time to time.
21162. So if we could go down a little in that picture. What I've identified is three of the candidates, Long Lake Heavy, Surmont Heavy Blend, Albion Heavy Synthetic and I've highlighted the sulphur contents and the TAN which, the TAN -- if everyone's not familiar, it's a characterization of the organization acidity of the oil and the way that -- it's not a litmus test as much as a chemical analysis where they take a gram of oil and figure out how many micrograms of potassium hydroxide are required to neutralize it. So it's a chemical test and it's a measure of the acidity of the oil.
21163. So in this page you see the range running from about .6 to 2.4 on TAN, and sulphur is relatively high, 2.5 to 3.5.
21164. So the next -- third page on from here, bottom of that one too. So as a further development of the rest of the -- of the rest of the potentials, and again, I've highlighted sulphur and TAN. So when you compress all that -- all those two tables into one, you see that there's TANs, organic acid levels ranging from 1.2 to nearly 3 and sulphur ranging from 2 to 5 percent. So these are -- these are not conventional crudes in that those levels are relatively high compared to a conventional crude oil.
21165. So could we have D80-27-3, please, Adobe page 8. Go down to the TAN story, which is 2.4, I think, yeah. And this is -- I forget whose evidence this is, Bakker? I think a Gillian Bakker prepared this one.

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21166. If you read part of that paragraph, you'll find that, typically, medium crude oils have a range of TAN from about .2 to .4 and dilbits exhibit a higher range. She's got 1.0 to 1.8 but the previous table shows that can go as high as 2.5.
21167. So many bitumens also have high TAN contents and list as high as 3.5 for Athabasca bitumen and 2.4 for Athabasca dilbit. That's just a regurgitation, more or less, of the previous aid to questioning.
21168. This is a long preamble, I apologize, but I'm going somewhere.
21169. So are you aware of the challenges that this range of product characteristics has presented to the modern double-hulled tanker industry, particularly the TAN and the sulphur levels?
21170. **MR. DONALD ROUSSEL:** Mr. Dwyer will answer that.
21171. **MR. MICHAEL DWYER:** Thank you for the question, Mr. Shannon.
21172. The marine industry has been aware for quite some time that the chemical composition of products carried can play some role -- unquantified in most of the studies, but it can play some role in the long-term corrosion patterns of a structure.
21173. Unfortunately, with respect to the TAN number, that's outside my area of expertise and generally doesn't factor into many of the papers that we work with, which really deal with the inspection, discovery, monitoring and mitigation of corrosion issues and long-term robustness of tankers. So I don't actually believe I can answer your question with respect to TAN.
21174. In terms of mild steel in particular, I'm not sure if NRCan can wade in and provide you a clear answer but, in general, you know, we deal with corrosion through a number of measures, some of which are regulatory, some of which are best practice by the shipping community -- by the marine shipping community -- some of which are recommendations and guidelines by the classification societies who inspect vessels.
21175. But, you know, perhaps in terms of the effect of TAN and mild steel perhaps NRCan can give a more specific answer.

21176. **DR. HEATHER DETTMAN:** This is Heather Dettman with Natural Resources Canada.
21177. I guess I was following your whole discussion and then -- and I was all ready and then you turned the application different from what I thought you were going to so anyway ...
21178. But I can still add to this. My research area is actually in understanding the organic acids in crude oils and so I'm familiar with the numbers that are given by crudemonitor.ca. Of that whole content of acids that's measured by TAN is a titration, like what you had mentioned, but it's -- well, just to put it into perspective, if you measured the TAN of the vinegar that you put on your salad, that would be 47. So the TANs -- the acid contents represented by these values are low. We can have the vinegar on our salad.
21179. And so, in the oils, the acids are very dispersed and low concentration and so, you know, under lower temperature kinds of conditions in pipelines and in tankers, I guess, they would be dilute and there could be mechanisms that come into corrosion but I'll leave that for a second.
21180. It also depends not only the content but the sizes of the acids and so, for instance, if you have a small acid -- like acetic acid that's in the vinegar -- that would be much more corrosive than a very large organic molecule that has an acid group on it just because of the -- basically, how it can interact, the mechanism that interacts.
21181. So for the Alberta oils, they have been washed extensively with water in Alberta. That's how they get it out, by steam assisted gravity drainage and these kinds of processes so that any of the smaller acids that might be there are washed out and removed at the production site so by the time it is ready to go in a pipeline, those acids are not there.
21182. And so, relative to other global crudes with even lower TAN values, they are not as corrosive. So that's one aspect at lower temperatures.
21183. Really, that whole discussion of TAN and sulphur contents is relevant to refinery conditions and it's big issues in refineries and that's actually why my research exists is because of the issues they have in refineries, to try to understand that.

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21184. And so how it becomes a problem in refineries is that the first thing a refinery does when an oil comes to it is it starts to do distillations to try to sub-fractionate it into different products that it's going to produce. As it does that sub-fractionation, those acids that were very dilute now suddenly get concentrated in one fraction and so the TAN of that fraction can go, you know, over 100 and then that's the issue.

21185. So that whole thing around TAN is complex. It's more relevant to refinery than it is to low temperature, like pipeline and, I imagine, tanker. That was a new application -- reference to tanker.

21186. **MR. SHANNON:** Thank you.

21187. I'd never considered putting dilbit on my salad, but I'll think about it.

--- (Laughter/Rires)

21188. **MR. DONALD ROUSSEL:** Madame Chair, Mr. Dwyer can give additional information about tanker, tanks, coatings and requirements that are coming in the streams so that there is actually no contact of the product with the actual steel.

21189. Mr. Dwyer?

21190. **MR. MICHAEL DWYER:** Yes, although I think, Mr. Roussel, -- and I don't know if I should but I sort of suspect that given the other two papers and Mr. Shannon's AQ that this is a line of questioning that he wishes to pursue.

21191. But with respect to protection of cargo tank -- oh -- protection of cargo tank -- Can you hear? Okay -- the International Maritime Organization has reached -- or actually several years ago, amended legislation -- international convention pertaining to -- and the clauses pertaining to cargo tank protection and, as of January 1st of this year actually, and applicable to vessels that delivered after a specific date in 2016, it's now a requirement to actually apply protective coatings to the bottom and the deck head -- the top if you like -- of cargo tank or oil tankers.

21192. I believe this is what Mr. Roussel was referring to.

21193. **MR. SHANNON:** Okay. Thank you for that answer. I'm glad you

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addressed cargo tank coatings, it's my second next page.

21194. Regarding epoxy coatings, which is typically the liner that is painted on the bottom reaches of cargo tanks, could we have D187-5-2, please?
21195. Again, I guess 75 percent works.
21196. This is a report containing research carried out for the Oil Companies International Marine Forum, OCIMF. The IPPIC is a paint working group.
21197. In this work, steel specimens were given various surface preparations - - shot blasting, prime coats, grinding and so on -- and what they were doing was evaluating the longevity of epoxy coatings exposed to various spiked samples of crude oils. The experiment was intended to explore various TAN levels and other material.
21198. So the range of dilbit TAN levels is previewed in this work. The tests were run for 6 months at 60 degrees centigrade. Test solutions were spiked with naphthenic acids which ranged from zero to 5 TAN. And the blistering results were explored after six months of exposure in this test.
21199. Could we have Adobe page 9 next, please? You'll have to tip that to landscape view, please. Maybe 75 percent, it's -- it's a very busy table, I apologize for this, but I just wanted to bring a point up here.
21200. There were 17 tests run, the six -- this shows you the results after six months. And the first three columns are the test -- test characteristics: TAN levels ranging 0- 2.5-5. Benzene/toluene is the next column and -- I'm sorry, I can't read that final -- what's that? H₂S. So that's -- that some estimate of the sulphur -- sulphur content of the crude oil.
21201. Now, to explain the table a little bit which I have to do -- it's brand new to some of you, I think, but it's on the evidence so here it is -- if you see a '0' on the table -- okay, I've got to explain the other columns, "4, 5, 6, 7", those are proprietary epoxy coatings. The other columns are whether the tests were immersed -- okay, whether the oil was mixed with water in the bottom or just oil.
21202. So the number of "0"s on the table indicate extensive blistering of the steel specimens. A "10" is a perfect sample, nothing happened to it. So typically on the table, you'll find that anywhere there's a 0 TAN on the left-hand column,

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- you find a series of '10's across the page for that particular specimen.
21203. So what they were highlighting here is the TAN was particularly aggressive the higher it went with these oils on the -- on the final outcome of the -- of the coupon after six months. So 0 is a good result -- no, sorry, 0 is a bad result in the table, 10 is a great result in the table.
21204. And what was particularly noticeable to me was the number of '0's on the table for the 2.5 TAN specimens. At the end of the test, the coupons were all photographed -- and if we could now move to Adobe page 14? You'll have to tip it again to -- oh, that's a terrible view.
21205. Very dark, I'm sorry, it's a black and white photo. The colour looks a lot better than that one does.
21206. The heavily blistered sample at the top of Adobe page 14 was at a 2.5 TAN oil. My concern is these protective coatings can quite quickly -- there's something about the oil in its -- I don't know if it's osmotic -- osmotic pressure, whatever, it's something about the oil with organic acids present that works very aggressively on epoxy coatings. So here's my concern.
21207. The TAN results looked at in these -- in this experiment was near the top but in the range of dilbits potential for Northern Gateway. My question -- here's the question -- I've got to give you a question because there's a preamble that's huge here: Would this degree of coating decomposition after six months of exposure be of concern to a Canadian receiving port? Kitimat?
21208. **DR. HEATHER DETTMAN:** I would just like to point out -- I'm Heather Dettman from Natural Resources Canada.
21209. Looking at their experimental protocol, what they used for creating the acid was 1-methylcyclohexanecarboxylic acid. That's essentially like using the vinegar. That's the acidic -- that's a very small acidic molecule and so will be a corrosive as heck and -- sorry, on the record. But anyway ...
- (Laughter/Rires)
21210. **DR. HEATHER DETTMAN:** So for them to use that is not at all representative of any crude oil because -- because no crude oil will have that small acid molecule in it and so I would say that this is not a representative study

- for it.
21211. Yeah, I would just say that because, you know, both -- it's just because it's such a small molecule. The -- in the dilbits, for instance, the boiling point of the acids there start at 280 degrees centigrade. So that's a carbon that -- and would not be water soluble because it's been so extensively washed. So this is not a representative experiment for that.
21212. So with any acids, if you have more or less, you will get more or less effect. But this is not a good model system for -- for acid corrosivity in crude oils.
21213. **MR. SHANNON:** That's an interesting answer. I wish you'd been involved in the set up of the test in the first place.
21214. So they should redo this with longer methoxy-whatever?
21215. **DR. HEATHER DETTMAN:** There are commercial naphthenic acid mixtures that are produced from the petroleum industry that would be better than this.
21216. That's actually a complex mixture that covers a full range of boiling points that you can buy from Sigma.
21217. **MR. SHANNON:** Thank you very much. Okay.
21218. So could we go now to DCW AQ 9, please?
21219. This is a report by Chevron Shipping Company to the 2000 ship builders meeting in Tokyo. It examines corrosion protection of cargo tanks in double-hulled tankers.
21220. Adobe page 7 near the bottom, please.
21221. In the highlighted regions, the role of microbes in the advancement of pitting attack on cargo tank bottoms is of concern to me. These microbes love sulphur. They also love no air. And all of those conditions are present at the bottom of a cargo tank where there's often a -- well, always a layer of water as well.

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21222. So if we could go to the top of Adobe page 8? Did I highlight that region? Is that Adobe 8? Maybe it's the bottom? Okay, there it is, the bottom. This identifies that coating defects can create niches that give rise to microbial-induced corrosion
21223. So with breakdown of corrosion -- sorry, with potential breakdown of corrosion protection which I -- I gather, based on the previous answer with the types of TANs present in crude oil might not be as swift as I had found from that report, it still is a potential to occur.
21224. And so if we could go to the top of page six next, please? There, that's good.
21225. It's a lot of stuff highlighted there but the -- the main -- the main extraction from that set of yellows is:
- "...pitting corrosion has been observed in cargo tanks less than five years old."* (As read)
21226. My question is: Has Transport Canada experienced ship summaries of oil cargo tanks with this degree of deterioration at such a young age?
21227. **MR. MICHAEL DWYER:** Thank you, Mr. Shannon. Michael Dwyer, Transport Canada.
21228. I'd just like to put it into context perhaps a little bit that this is actually a paper from the Tanker Structure Cooperative Forum, which is a grouping of tanker companies, classification societies, it includes several members from the Oil Company International Marine Forum.
21229. And this particular organization, which is not a secretariat but a collection of entities which meet regularly to examine issues pertaining to tankers, actually interfaces with the ship building community at discrete moments and this is not necessarily a ship builders meeting per se, but this forum's meeting with the ship building industry in Tokyo of 2007. And the paper does point to several discrete cases of more rapid corrosion than is -- than is the norm.
21230. Has Transport Canada experienced or have direct evidence from our inspectorate with respect to pitting corrosion of that rapidity? I would -- in my experience, no, we have not.

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21231. Has the international marine regulatory community been following these issues? I would have to say yes, this is a non-governmental organization but several of its member groupings provide input into the international regulatory forum, primarily through the International Maritime Organization, in particular the members of Intertanko, OCIMS.
21232. This particular paper was produced by an OCIMS member, I believe Chevron Shipping, a company which we have some familiarity through east coast tanker operations.
21233. Transport Canada has certainly been engaged with the international regulatory community through the IMO to advance a number of regulatory initiatives that seek to continually improve the status of shipping.
21234. I note this paper was done in 2000, but in actual fact the most recent ship building meeting with this particular forum was again in Tokyo, it was in 2011. I don't believe that information is in evidence and you haven't submitted it as an AQ, but it's probably up to date. But since this particular paper has been written there have a number of initiatives in the world to monitor and mitigate the effect of corrosion cargo tanks.
21235. The baseline document, Resolution A744(18), which calls for the enhanced survey of -- enhanced survey program of tankers and bulk carriers. It's certainly been amended in '96-97, but since the day of this paper 2002-2007, as I mentioned at Mr. Roussel's request earlier, international regulation has been brought into place to require coating measures for cargo tanks.
21236. The Classification Society, in particular the International Association of Classification Societies which comprises the 13 largest and perhaps arguably better Classification Societies. But under the leadership of Lloyds, ABS and Det Norske Veritas developed and instituted in 2006, common structural rules for oil tankers which certainly has advanced the mitigation of built-in corrosion measures in an effort to have measure translucency. And this particular set of common structural rules have actually been adopted by the IMO for their goal-setting regulations, again commencing 2016.
21237. But I apologize, it's a long-winded answer, but I wanted to make two points: that much in the world of shipping has advanced since the publication of that paper; much has advanced because of best industry practice because of

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forums such as this which have been ported into the international marine organization.

21238. And simply put, do I or any of the inspectors ever -- who ever worked under my leadership experienced cargo tank corrosion at that rate? I'd have to say, in short, no.

21239. **MR. SHANNON:** Thank you. I'll wrap my head around that one a little later.

--- (Laughter/Rires)

21240. **MR. SHANNON:** Could have AQ11, please?

21241. I think you referred to Intertanko along the line of that answer, but this is a corrosion paper of 2002 which you have no doubt had time to review. And it's again talking about corrosion in double-hulled tankers. In Adobe page 7 in the middle, yeah, highlighted is:

“The immediate risk of unchecked pitting is naturally the pit can penetrate the bottom plate and allow the crude oil cargo to leak into and contaminate the ballast spaces.” (As read)

21242. Now, further down the page:

“There is also a risk associated with the combustible gases in the ballast spaces.” (As read)

21243. And further on, to the top of Adobe page 8:

“The pitting was deep and of an intensity that an experienced tanker surveyor would expect to find on 20 year old tankers and not on tankers less than five years old. The pitting was deep as 7.9 millimetres in 18 to 20-millimetre thick tank bottom plates was found.” (As read)

21244. So before I go to the next question -- that's a bit of a preamble -- could I please have Transcript 156, line 31554 -- 31554. Okay.

21245. This is the testimony of Keith Michel, at a previous panel, in which he

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identifies fatigue cracks that occasionally occur between cargo tank and ballast tank showing up as oil leaks into the ballast region.

21246. So my concern with that little -- that rather long preamble is pitting corrosion and fatigue cracks in the cargo tank giving rise to explosive gases in the ballast tanks.

21247. My question is how will either Transport Canada or Coast Guard -- I don't know which agency would be responsible for this -- how would they confirm that for tankers calling in Kitimat that cargo tank gases are not present in the ballast regions?

21248. **MR. MICHAEL DWYER:** Sorry, Michael Dwyer again.

21249. You -- are you referring to tankers with cargo or in ballast, Mr. Shannon?

21250. **MR. SHANNON:** These would be -- these would be tankers in -- the way I understand it, these would be cargos not in ballast but about to receive a cargo.

21251. **MR. MICHAEL DWYER:** Michael Dwyer again.

21252. So for cargos about -- for tankers about to receive a cargo, of course, the cargo space is inerted, generally, and would not, by definition, be in possession of explosive gases. For -- and I guess the supposition is if there exists small fatigue fractures or if, indeed, there exists pitting which is causing penetration, which I believe to be a fairly rare event, what would be the influence of petroleum gases in the ballast spaces; should they be void.

21253. And of course, there are -- there are measures built in to the vessel in terms of how tanks are sounded and gas monitoring is available to assess the status of ballast tanks. It's actually a requirement that there are means to assess ballast tanks for explosive measures and that these means should be able to fairly represent the atmosphere in the tank. And indeed, down the road there will be international legislation that calls for these means to be fixed rather than portable.

21254. So while it is perhaps a not common phenomena -- it's not a phenomena that's unknown and that there are mitigation strategies in place to deal with that and, further, there are a number of industry practices which are not

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- regulated by organizations such as ourselves which speak to the -- the shipboard operations and procedures that are designed to, you know, monitor and mitigate any risk.
21255. And the one that most operators in the world use is actually published by Intertanko, and it's called the International Safety Guide for Oil Tankers and Terminals, or in the trade ISGOTT.
21256. So it's a -- I think it's a relatively rare, certainly in my experience, phenomena, but it's one for which there are mitigation measures in place.
21257. I hope that answers your question.
21258. **MR. SHANNON:** The way I understand it is normally the cargo tanks are inerted, not the ballast regions. Is that correct?
21259. **MR. MICHAEL DWYER:** Yes, that's correct. But a concern, of course, of adjacent tanks, always, is that should there exist a positive pressure on one tank that the atmosphere on one cannot pass to another. So, you know, that is another concern above and beyond your question with respect to explosive mixtures within the ballast tanks.
21260. **THE CHAIRPERSON:** Mr. Shannon, I don't -- is this an appropriate time to take our morning break?
21261. **MR. SHANNON:** That'd be a good idea.
21262. **THE CHAIRPERSON:** Okay, great. Thank you.
21263. Let's be back for 10:15, please.
- Upon recessing at 9:59 a.m./L'audience est suspendue à 9h59
--- Upon resuming at 10:16 a.m./ L'audience est reprise à 10h16
21264. **THE CHAIRPERSON:** If we can get everyone to take their seats, we'll be ready to get underway.
21265. Ms. Niro, as we're getting underway, could we please get an AQ number, please, for Douglas Channel Watch for questioning of this panel?

21266. **THE REGULATORY OFFICER:** That will be AQ91.

--- AID TO CROSS-EXAMINATION NO./AIDE AU CONTRE-
INTERROGATOIRE No. AQ91:

*Douglas Channel Watch - Aids to cross-examination of the Government of
Canada Panel 2*

21267. **THE CHAIRPERSON:** Thank you, Louise -- Ms. Niro.

21268. **MS. ANDERSON:** Madam Chair, if I might interject with just a brief preliminary matter.

21269. I understand one of the witnesses has a clarification that he would like to make with respect to an answer given to the Panel yesterday.

GEORGE ARMSTRONG: Resumed
ANDRÉE BLAIS-STEVENSON: Resumed
CARL BROWN: Resumed
KEVIN CARRIGAN: Resumed
JOHN CASSIDY: Resumed
CAROLINE CAZA: Resumed
JOSEF CHERNIAWSKY: Resumed
JOHN CLARKE: Resumed
KIM CONWAY: Resumed
HEATHER DETTMAN: Resumed
CHRIS DOYLE: Resumed
WAYNE DUTCHAK: Resumed
MICHAEL DWYER: Resumed
MICHAEL ENGELSJORD: Resumed
CHARLES HANSEN: Resumed
GRANT HOGG: Resumed
BRUCE HOLLEBONE: Resumed
ALI KHELIFA: Resumed
ERIK KIDD: Resumed
THOMAS KING: Resumed
GWYN LINTERN: Resumed
LAURA MACLEAN: Resumed
FRANÇOIS MARIER: Resumed
PHIL MURDOCK: Resumed

GLENN ORMISTON: Resumed

DONALD ROUSSEL: Resumed

PAUL TOPPING: Resumed

ROB TURNER: Resumed

SHANE WALTERS: Resumed

21270. **DR. BRUCE HOLLEBONE:** Hello, it's Bruce Hollebhone for Environment Canada.

21271. Briefly yesterday, Madame Chairman, I referenced the product called Orimulsion in my discussions with you, and I misspoke. I characterized it as an oil and bitumen mixture. It is, in fact, or was, in fact, a water-bitumen mixture.

21272. And I just wanted to clarify that because there is an important difference there with the products under consideration.

21273. **THE CHAIRPERSON:** Thank you, Dr. Hollebhone.

21274. Mr. Shannon, please continue with your questions.

**--- EXAMINATION BY/INTERROGATOIRE PAR MR. SHANNON:
(Continued/Suite)**

21275. **MR. SHANNON:** Thank you, Dr. Hollebhone, that was going to be my next question because I'd only ever seen it referenced as a water-bitumen mixture. That's on line 19880. I was going to say, I've got to scratch that question now.

21276. From what I've read of Orimulsion, it's particularly problematic whenever you have a spill on the ocean waters because it's already an emulsion of water and bitumen and it kind of quickly disappears in saltwater, freshwater, depending on weather situations. Is that your understanding?

21277. **DR. BRUCE HOLLEBONE:** My understanding of Orimulsion -- now, I haven't worked directly with this product. This research took place -- I'm very familiar with the reports, but I will caution that what I know is from reading the research and from being in the lab at the time that work was done.

21278. So with that caution, my understanding is that the salinity made a very large difference to the behaviour of the product and that in freshwater it would

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- remain dispersed for considerable amounts of time, but in higher salinities, the emulsion could break. The chemistry didn't work as well in the saltwater conditions.
21279. **MR. SHANNON:** I'm looking for clarification. I haven't been able to find it.
21280. Can you tell me from your experience what the TAN acid levels would be in Orimulsion? It's just for some more background.
21281. **DR. BRUCE HOLLEBONE:** Personally, I don't have that information available, although ---
21282. **DR. HEATHER DETTMAN:** I don't actually have the TAN of that - of that particular oil. I do have of other -- you know, from that country, kind of thing, but not that specific product.
21283. **MR. SHANNON:** Okay. That's not too germane to this discussion anyways, just for my own information.
21284. So I was raising Orimulsion in reference to dilbit cargos because of some differences there might be between the two as far as a double-hulled tanker is concerned.
21285. Has Transport Canada had experience with crude oil tanker inspections of tankers whose cargos have been dilbit?
21286. **MR. DONALD ROUSSEL:** Yes we do, at the western terminal in Vancouver.
21287. **MR. SHANNON:** And those were all less than VLCC, I presume.
21288. **MR. DONALD ROUSSEL:** Yeah, they're Aframax size.
21289. **MR. SHANNON:** Aframax.
21290. **MR. DONALD ROUSSEL:** Yes.
21291. **MR. SHANNON:** To your knowledge -- I'm not sure whose knowledge this will be -- does anyone know where else in the world dilbit is now

- carried on VLCC tankers?
21292. **MR. DONALD ROUSSEL:** No, we don't have that information.
21293. **MR. SHANNON:** What I'm concerned with is this may be a test case having it proposed for the Port of Kitimat and I don't know whether world experience exists with respect to that size of ship carrying this cargo in view of some of the corrosion issues and cracked hull situations that I've brought up.
21294. **MR. DONALD ROUSSEL:** Madame Chair, if we go to back to crudemonitor.ca and we look at the different type of crude oil that could be potentially carried, you would see that the specific gravities of the product is close to any of the other heavy crude oil. So we do not anticipate any difference into the behaviour of the cargo if you put it into an Aframax or a Capesize or a VLCCs vessel.
21295. Those vessel carry crude oil around the world for different type of clientele and there's no issue that were reported regarding the particularities of the different oil product other than what you present in front of us, which was the specificity regarding some pitting and the different elements of inspections of tankers which is tanker inspect on a regular basis.
21296. And this is normal dialogue within the industry, with the recognized organizations, the ship owners, the shipyards to go and see the specific case and come up with a different corrective matters, including corrective matters regarding the future design of vessels.
21297. So we don't see much of a difference that it will make if you carry the dilbit, synbit or de-synbit into an Aframax versus a VLCC.
21298. **MR. SHANNON:** My concern goes beyond -- okay. It gets into such things as ship flexing during rough weather, which we experience here on the north coast, that particular cargo, its potential to -- with the high sulfur content in it, lead to pitting, other acid attack type corrosion to exposed cargo tank.
21299. So that's why I was looking for another region on earth with -- I guess I have to add the addition to my question -- with this kind of weather carrying that cargo. So I think your answer is no, there is nowhere else on earth that carries this cargo at our latitudes?

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21300. **MR. DONALD ROUSSEL:** Yeah, not with -- we're not informed of that but carrying of oil around the world and in different type of tankers, either in this latitude or in the more harsh conditions of the North Atlantic, is a daily matter. There's tens of thousands of tankers moving cargo around the world.

21301. And the North Atlantic is certainly one of the most difficult place to -- for oil tankers, certainly in the one that we see that are taking oil -- that are already taking oil as we speak from Venezuela to the Bay of Fundy; from VLCCs also leaving Port Hawkesbury for a customer around the world, we have experience with VLCCs in Canada carrying oil in the country and a series of other tankers that are operating on the Grand Banks as we speak, all year round, with what we would call in the "Atlantic Hurricane Alley".

21302. **MR. SHANNON:** Thank you.

21303. Could we go to B83-20, please, Adobe page 7? Probably 75 percent on this would be -- well yeah, that's good.

21304. Shown here is a table with tanker age on the left column and inspection type in the other columns. So you can read year of tanker age, type of inspection and what was looked at. The final column is how comprehensive was the survey.

21305. So to my knowledge, that would seem to suggest that a close-up survey with thickness measurements of the cargo tank bottoms wouldn't occur until year five. Then seven and a half years, a visual inspection of the representative tanks -- whatever that means -- would occur. And 12 and a half years -- same kind of -- well, a close-up survey with thickness measurements during dry dock inspection.

21306. Does this -- do you think this is a frequent enough corrosion -- I'm getting to the -- an inspection regime for some of the corrosion issues that could be possible with these ships, with this cargo?

21307. **MR. DONALD ROUSSEL:** Mr. Dwyer will answer.

21308. **MR. MICHAEL DWYER:** Madam Chair, thank you very much, Mr. Shannon.

21309. This is of course the internationally accepted frequency of surveys

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- required by classification and under the pertinent legislation, annual intermediate and special survey.
21310. And in concert with the enhanced survey program required by IMO Resolution 77 -- 74418, and also in concert with the requirements of the tanker operators to perform routine work inside enclosed spaces under certain permit conditions, we believe that this is, yes, an adequate frequency of inspection.
21311. And it has served the marine community very well over a broad range of ship types, so this is especially adapted, of course, to tankers. So I'm being verbose, I apologize. Yes, we believe this is adequate.
21312. **THE CHAIRPERSON:** Mr. Dwyer, when you respond later, if you could just pull your microphone a little bit closer it would be helpful for all of us.
21313. **MR. MICHAEL DWYER:** My apologies, Madam Chair.
21314. **THE CHAIRPERSON:** I don't believe there's any problem with the answers you provided so far but just to ask you going forward to pull it a little closer. Thank you.
21315. **MR. DONALD ROUSSEL:** If I may add, Madame Chair, this is the requirements regarding the recognized organizations requirement in a flag state to the flag state will have delegate, in general, their power to the recognized organization of Classification Society to do the work on their behalf.
21316. Above these regimes, we have on the Pacific, what we call the Tokyo MOU and on the Atlantic, the Paris MOU on port state control which ensure that vessels are visited for port state central purposes every six months. And then we are committed for a tanker visit on a yearly basis.
21317. Within these regimes, if you detect or you find out that there is any issue regarding a more in depth inspections, the port state, which is across Canada, as a port state where those are soon going to be visiting us, we can go in at any moment, an in depth inspections. And we are actually doing it when we find out that vessel are either not meeting the requirements or the -- we think that the Classification Society may not have covered some elements.
21318. So we will not hesitate to engage into tank inspections or further inspections if we think that there is a doubt that a vessel is not up to conditions.

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- And we do not hesitate either, Madame Chair, to detain vessel, inform the flag state and the Classification Society so that they come and make the appropriate corrections before the vessel can take a load. And it's happening on a daily basis around the country as we speak and also with our more than 42 partners around the world on port state control. Thank you.
21319. **MR. SHANNON:** Can you see any situations where Canada's inspections might require looking below the deck plates on a receiving tanker?
21320. **MR. DONALD ROUSSEL:** If we have evidence that the vessel is substandard, or we have doubt, or we receive a complaint from the crew -- for example, if there -- like you described, if there is a leak in a cargo hold -- we will not hesitate to ask the ship owners to make those tanks available for inspections, making them gas free and engaging to inspections. In the meantime, the vessel will be at anchor, it will be off charters until the matter is corrected.
21321. So we're doing that -- our biggest -- I would say the ship we have the most problem is certainly bulk carriers and, in the past, I would say, 20 years in Canada we have improved significantly the quality of shipping that we receive in this country and the efficiencies of the ports operations as good ship make fast turnaround in port and it's good for the overall efficiencies of the transportation systems.
21322. But we do not hesitate to go right down in the ballast tanks, the cargo hold, the machinery space, any other area that require in-depth inspections, and we take -- we make accountable the ship owners, the classification societies and, on all those detentions, we also involve the flag state so that the vessel either make the corrections or is not allowed to take a cargo. That means he's leaving the country without a cargo which is an extremely costly endeavour for an operator.
21323. **MR. SHANNON:** Thank you.
21324. I will change to a different topic now.
21325. Who can comment from the Panel on the effectiveness of booms on oil spills, sea states -- the sea states relative to the effectiveness of a boom in containing oil?
21326. **MR. GEORGE ARMSTRONG:** George Armstrong with an

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environmental response, Canadian Coast Guard.

21327. The effectiveness of the boom has a lot of different parameters. It depends on the sea state, the wind state, tidal currents, and there's different types of booming out there. Previous panels have discussed it extensively. In open water, we have longer booms. In towing on our inshore booms, which should be in the regards of the Douglas Channel, 1 knot, after that, we -- you'll have a cascade effect of the oil going over the boom or under the boom.

21328. So what you have is different strategies will be involved. It depends on the area it will be, whether you're drifting with it, booming or redirecting oil. There's quite a few different strategies. It depends on the area, the amount and the product you're dealing with.

21329. **MR. SHANNON:** So my understanding is the type of chop you get in the confined channel assessment would give rise to a different boom type in high winds, for example?

21330. **MR. GEORGE ARMSTRONG:** Yeah, equipment is dependent on -- very high winds there will be no -- booming will be ineffective as well as skimming techniques.

21331. **MR. SHANNON:** Thank you.

21332. **MR. ERIK KIDD:** Erik Kidd from Transport Canada. I can add some additional information to that.

21333. There are boom systems that are capable of exceeding the 1 knot parameter. There are harbour buster systems or current buster systems. And ---

21334. **MR. SHANNON:** Sorry, say again.

21335. **MR. ERIK KIDD:** Harbour buster systems.

21336. So the system -- when I talk about a system, it's not just the recovery booming system, it's incorporating the skimmer as well and the associated tankage alongside.

21337. So what you have there is new technology within the last 10 years developed to perform skimming operations in more difficult situations in open

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water or confined channel areas.

21338. **MR. SHANNON:** Okay. Thank you.
21339. My next question's a little bit -- may seem a little bizarre but I'll go with it anyway. Are you familiar with the 1993 Braer disaster where it was a single-hulled tanker that broke apart off the south part of Shetlands?
21340. Anybody on the Panel know about that one?
21341. **MR. ERIK KIDD:** We are aware of it at Transport Canada.
21342. **MR. SHANNON:** On reading some of the eventual outcomes of that particular spill, which was enormous, it turns out that the light oil that it was carrying from Mongstad to Canada was found on some of the sheep in the field and the grasses as well.
21343. So that's a preamble in a sense to this part of the question: We know there are several modeled-fate-of-oil-spill inputs to modeling. These are evaporation while it's on the water -- this is talking about the oil -- evaporation while on water, photo oxidation, emulsification, temperature, salinity, sedimentation, et cetera.
21344. How would airborne oil be taken in account in vis-à-vis evaporation, for example, in any modeling, apart from real world?
21345. I'm trying to get my mind around how the characteristics of the oil could change while evaporating while being blown across the sea and I don't think any of the modeling efforts so far have taken that one into account.
21346. **DR. BRUCE HOLLEBONE:** Bruce Hollebhone for Environment Canada.
21347. There's a couple issues you've raised here and I think we may need to separate them. The issue of oil going up onto the shoreline is usually regarded as spray rather than evaporation. So it's transfer of bulk oil as a whole into as droplets in the -- much like sea spray would be. Evaporation doesn't usually evaporate into the air and then re-condense elsewhere. So we'd want to differentiate that.

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21348. Now, in terms of your second part, evaporation with respect to wind speed? Is that -- am I correct in understanding that?
21349. **MR. SHANNON:** Well, I've followed SL Ross reports on evaporation while oil is on water ---
21350. **DR. BRUCE HOLLEBONE:** Right.
21351. **MR. SHANNON:** --- up to the density -- up to the specific gravity of the water it's floating on, but -- and I can envisage why you can't proceed much further with density increases if you're on water but, while you're in the air, what else can happen?
21352. Do you follow my drift?
21353. **DR. BRUCE HOLLEBONE:** So you're talking about, say, weathering of spray droplets in the air?
21354. **MR. SHANNON:** Yeah. M'hm.
21355. **DR. BRUCE HOLLEBONE:** Okay.
21356. I don't think we have really great data on that. At least I'm not aware we have really great data on that.
21357. It's "spray on the overbank", as we call it, inland of the surf zone. It is something that has been observed to happen and is quite often a feature of clean-up when we have to deal with shoreline impacts. I'm not aware that we specifically modeled the effect on the overspray section.
21358. Maybe Ali wants to talk about that.
21359. **DR. ALI KHELIFA:** Ali Khelifa, Environment Canada.
21360. I'm still confused about your question. Are you looking to -- or asking about the modeling of the phase that evaporate?
21361. **MR. SHANNON:** Well, I told you it was going to be bizarre so ...
21362. Anyways, yeah, I can see it as an inability -- you can model so many

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- things in the lab but, in the real world, you need to expose -- you have to have the situation in the real world to discuss all the potential outcomes from an oil spill.
21363. So I'm saying -- part of my question is: How adequately addressed is a fate of oil spill done by lab models?
21364. **DR. ALI KHELIFA:** Still a complex question but I'll try to be helpful here from a modeling perspective.
21365. I think what you're trying to ask here is, given a spill on water in real world, how we can predict where it's going and what's happening to this oil based on very limited, perhaps, limited information that we get from the lab; is that right?
21366. **MR. SHANNON:** Beautiful.
21367. **DR. ALI KHELIFA:** Okay.
21368. Madam Chair, the answer to this question may be very long because I think he's trying to understand something that it's complex.
21369. From a modeling perspective, we don't rely only on limited information that's coming from the lab to develop these predictive models, it's a combination of knowledge that is obtained, yes, from what we call a "lab scale", a smaller scale experiment from a meso-scale which is intermittent between lab scale and real scale and, as well, from what it's called "spills of opportunities" or real spills or fill charts.
21370. So developing this kind of models what they're called "oil spill models", it's not something that happens from one day to another or one year to another. This is a multi-decades work of developments of this different behaviour. So I'll try to be helpful again.
21371. As you mentioned very well, yes, there are different processes that control the -- what's going on, what happened to the oil after spill. You mentioned evaporation, you mentioned dissolution, you mentioned dispersion and so on. And the role of modeling, in cooperation with chemists like my colleague, Dr. Hollebone, is try to develop what is called "behavioural models" of the different processes that take place. As such, evaporation: how we can estimate evaporation, how we can predict evaporation, considering the different parameters

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that affect this.

21372. Having -- once these information are collected, the behavioural models, then these behavioural models are integrated within mathematical models to solve the main equation that tells us where the oil is going.

21373. Another important information that needs to be taken into account is the real world, where the spill happened, the information about water temperature, the concentration of suspended sediment -- particulate matters that we mentioned yesterday -- the wind speed and so on. This is another information that the model needs to run the -- to predict the trajectory and the fate and behaviour of model.

21374. I hope that answered the question. But if you want further clarification, we would be more than happy to provide.

21375. **MR. SHANNON:** Yes, that was a good answer. Thank you very much.

21376. I guess that wraps up my questions. I thank you for your indulgence.

21377. **THE CHAIRPERSON:** Thank you, Mr. Shannon.

21378. We'll call next the Haisla Nation.

--- (A short pause/Courte pause)

21379. **THE CHAIRPERSON:** Good morning, Mr. McCormick.

21380. Are you settled in and ready to begin?

21381. **MR. McCORMICK:** We are all ready to go, Madame Chair.

21382. **THE CHAIRPERSON:** Thank you very much, Mr. McCormick.

21383. Please begin.

--- **EXAMINATION BY/INTERROGATOIRE PAR MR. McCORMICK:**

21384. **MR. McCORMICK:** Thank you.

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21385. Good morning, members of the Joint Review Panel, NEB staff, witnesses, my friends at the counsel table. My name is Jesse McCormick. I'm legal counsel to the Haisla Nation. I believe I've had the opportunity to question some of you earlier. Welcome everyone here today.
21386. I'm joined here today by Astrid Jacobson to my immediate right and Gillian Bakker, who both provide technical services to the Haisla Nation and have supported the questioning that you will have posed to you today.
21387. During questioning by the Joint Review Panel -- I believe it was yesterday -- there was some discussion of the current state of the research being undertaken in relation to the fate and effects of diluted bitumen. I think it would be helpful if we briefly go to the transcript.
21388. Madame Clerk, could we please see displayed on the screen Transcript Volume 169, line 19869?
- (A short pause/Courte pause)
21389. **THE CHAIRPERSON:** Just bear with us, we're having some technical difficulties.
- (A short pause/Courte pause)
21390. **THE CHAIRPERSON:** The system works really well until the machine doesn't work. It has nothing to do with Ms. Niro, let me reassure you.
21391. **MR. McCORMICK:** If it's helpful, Madame Chair, I think we could proceed with the questions in the hope that the transcript reference isn't entirely necessary.
21392. **THE CHAIRPERSON:** Thank you, Mr. McCormick.
21393. Let's try that, although if we need the transcript on the screen, we'll take the time to get it there.
21394. **MR. McCORMICK:** Certainly.
21395. I was going to refer to discussions I believe it was between Dr.

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Hollebone and counsel to Gitxaala, Mr. Janes.

21396. Essentially, the idea behind my understanding of the transcript was that there was a need for more research, more information to be gathered about the rate of change of the products that might be shipped as part of this Project, if it is approved.

21397. Dr. Hollebone, would you agree that there does need to be more research and more information gathered to understand the rate of change?

21398. **THE CHAIRPERSON:** Mr. McCormick, just -- what was the line number that you were looking to reference?

21399. **MR. McCORMICK:** The line number is 19869.

21400. **THE CHAIRPERSON:** I believe it will be appearing shortly.

21401. **MR. McCORMICK:** Thank you.

--- (A short pause/Courte pause)

21402. **DR. BRUCE HOLLEBONE:** Okay, Bruce Hollebone for Environment Canada.

21403. Yes, I think what we're trying to get at here is we don't have fully developed models for some of the -- in our opinion, we don't have fully developed models for the -- some of the behaviour characteristics of this material as it may evolve in the environment.

21404. As my colleague just answered to the previous -- to the previous intervenor, the models rely on these fate models to -- and behaviour models to compute the behaviour of the oil so that it can then be modelled accurately in the environment.

21405. And as reflected -- as in reflected in our evidence, we've outlined a number of specific cases where we believe there are information gaps.

21406. **MR. McCORMICK:** And has a lot of research either been conducted by the federal government to investigate this aspect of fate and behaviour for the oils in question?

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21407. **DR. BRUCE HOLLEBONE:** There has been some preliminary work done as our regular conduct of business particularly following the product that was spilled in Burnaby and as part of the Kinder Morgan Westridge Pipeline rupture.

21408. That particular product has been looked at a little bit, I wouldn't say a lot. But many of the other products that are under proposal for this pipeline have not been looked at by my laboratory, although some information was included with the submission as well. We've not been able to identify very much else in literature regarding these products.

21409. **MR. McCORMICK:** Thank you, Dr. Hollebhone.

21410. Madame Clerk, could we please see displayed on the screen Haisla Nation Aid to Cross-Examination Number 4? Thank you.

21411. This is a March 20, 2013 article from the Globe and Mail. Has the witness panel had the opportunity to review the highlighted portions?

21412. I see some heads nodding.

21413. I direct your attention to the first highlighted portion. Would the witness panel agree that Dr. Merv Fingas is one of the country's top oil spill experts?

21414. **DR. BRUCE HOLLEBONE:** Dr. Fingas was the head of my particular research group for a number of years. He retired in -- I believe 2006.

21415. **MR. McCORMICK:** If I could ask you to please note the last sentence of the third paragraph where it indicates:

“Every time we did get a sample of any kind of bitumen in the laboratory and analyzed it, it always sank.” (As read)

21416. To your knowledge, is he referring to research completed by Environment Canada?

21417. **DR. BRUCE HOLLEBONE:** I believe he is, although he did do some independent work on his own.

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21418. **MR. McCORMICK:** And has Environment Canada conducted or participated in research which found that bitumen sank or submerged?
21419. **DR. BRUCE HOLLEBONE:** We had done a fair bit of work, as I alluded to earlier, with the Orimulsion product which is a Venezuelan bitumen or a Venezuelan bitumen derived product. It has some similarities to -- or the Venezuelan bitumen has some similarities to the Canadian products, but there are significant differences as well.
21420. We had also looked at some of the early bitumen products -- and I would emphasize just bitumen, not the diluted bitumen product -- produced in the Cold Lake area in the late eighties I believe.
21421. **MR. McCORMICK:** Thank you, Dr. Hollebhone.
21422. We see in the second paragraph a statement from Dr. Fingas that the diluent comes off fairly rapidly, so you really have to look at the density of the base compound, the bitumen underneath it. Would you agree with that statement?
21423. **DR. BRUCE HOLLEBONE:** I would agree with it in general. I don't know if we have enough information to be as strong here on the record as Merv has been.
21424. The -- we had not, under Merv's time in our laboratory, had a chance to look at dilbits directly. They were not being shipped by the time he -- well, they were being shipped, but they hadn't -- we had not received a commercial sample of that product by the time he left our organization.
21425. I wouldn't disagree in general with his statement, but I'm not sure I want to be that -- as strong as he's being here.
21426. **DR. HEATHER DETTMAN:** Actually -- Heather Dettman with Natural Resources Canada.
21427. I would, from our perspective of understanding these kinds of products, it's that the light ends of the diluent would come off and that's not the whole diluent.
21428. **DR. BRUCE HOLLEBONE:** Yeah, this is why I don't want to be

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- that strong because there are complications here of -- it's the unbreaking egg issue that I brought up yesterday. There are portions of the diluent that will not fully leave the oil. And so to say that it will completely separate may be a bit overstating the case here.
21429. **MR. McCORMICK:** Thank you.
21430. Would you agree that the characteristics of the remaining substance after the lighter notes of the diluent have weathered off would resemble more closely the bitumens which had been examined?
21431. **DR. BRUCE HOLLEBONE:** It comes close to approximating that, yeah.
21432. **MR. McCORMICK:** Could we please turn to page 3, Madame Clerk?
21433. We see in the highlighted portion -- it is stated that "Environment Canada's studies of bitumen in spills date back to 1995". Is that correct?
21434. **DR. BRUCE HOLLEBONE:** Yeah, that specifically refers to the early work with Cold Lake bitumen and most particularly with regard to the Orimulsion studies.
21435. **MR. McCORMICK:** And what types of analysis or tests were performed by Environment Canada in relation to that product?
21436. **DR. BRUCE HOLLEBONE:** You're referring to the Orimulsion product?
21437. **MR. McCORMICK:** Yes.
21438. **DR. BRUCE HOLLEBONE:** Okay. There were a number of studies conducted with regard to what we term baseline or -- our baseline database work that we do, much of which is published on our website as the Oil Properties Database.
21439. So this would include the basic physical parameters that we generally look for to supply to the modelling community when they need to do the spill modelling, so density, viscosity, surface tension, those sorts of things. We also

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include chemical data, and this is particularly useful in developing a forensic model for tracking a spill.

21440. One of the problems we have during a spill is often figuring out is this oil the oil from the spill or from another spill. And so developing that forensic model during a spill is often very handy as well for monitoring effects, for monitoring extent of the spill, also for monitoring the changes to the spill during - - as the spill evolves during cleanup.

21441. We -- I had also done a number of studies that I talked about yesterday as part of -- sort of an enhanced research program on the Orimulsion product because it was a fairly new product to the Canadian market at that time and there were a considerable number of things we wanted to understand about it.

21442. So we looked at things like dispersion of the product in water, there were tests on that. There were tests on the adhesion of the product to shoreline materials, so we simulated shorelines in the lab. We looked at the potential for natural removal and -- that is to say wind and wave removal -- or removal using sprays or potential treating agents that were under consideration at the time. And finally we also looked at the possibility of using in situ burning to clean up the material. There are others as well but those are sort of the highlights of the program.

21443. **MR. McCORMICK:** Thank you, Dr. Hollebhone, that's very helpful.

21444. Just to touch briefly on one of the points you raised. I believe you noted that the -- there was a portion of the study that was dedicated to attempting to find a way to distinguish one oil from another oil for the purpose of knowing which spill that oil originated from.

21445. Is that based on a presumption that you would have more than one oil spill occurring in a short period of time or on a -- on the basis that there would be a longer persistence of oil in the environment and you would then have to distinguish?

21446. **DR. BRUCE HOLLEBONE:** The issue often is if there was a spill in say -- say in a harbour where there have been a lot of previous historical activity, that there may be pre-existing backgrounds that we have to remove from the measurements that we make to understand that we're not over cleaning or to -- well, over cleaning and causing extra damage to cause -- and to be able to track

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the spill extent. And this is often an issue in an area where there's been a lot of human -- a long-term of human occupation or incidence of -- particularly industrial use.

21447. **MR. McCORMICK:** And I believe you mentioned that -- I'm not sure if I'm identifying it correctly, but Alberta Cold Lake bitumen was also examined. Were the same types of studies conducted on that site?
21448. **DR. BRUCE HOLLEBONE:** Cold Lake bitumen again, as I talked about earlier, we have this continuing as part of our regular research this sort of baseline dataset that we like to generate.
21449. Cold Lake was one of those products that we included in that but there was not a great deal of extra work done on Cold Lake at the time.
21450. **MR. McCORMICK:** Did any of the studies on either of the products examine buoyancy and the propensity of the product to sink or submerge?
21451. **DR. BRUCE HOLLEBONE:** Merv and I co-authored a paper in, I believe 2004, on potential for -- no, no, it would have been 2006 sorry, on the potential for bitumen to sink -- or bitumen products as well as other products to sink in freshwater. I believe this is referenced in the evidence by other people, so.
- (A short pause/Courte pause)
21452. **MR. McCORMICK:** Have any samples from the actual product which will be shipped as part of this project been provided to Environment Canada for analysis?
21453. **DR. BRUCE HOLLEBONE:** We have obtained some samples, yes, just recently, through my colleague at NRCan.
21454. **MR. McCORMICK:** And do you know when NRCan -- or perhaps NRCan can assist, when those samples were received?
21455. **DR. HEATHER DETTMAN:** Those were -- those samples were received in our lab in March and we then took samples for our own research as part of this program that we're currently in for interdepartmental research.
21456. And then forwarded sub -- or samples to Environment Canada and

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- DFO so that we have the same oil to be doing all our work on so that we can compare.
21457. **MR. McCORMICK:** And by March you're referring to March 2013?
21458. **DR. HEATHER DETTMAN:** Yes, March 2013.
21459. **MR. McCORMICK:** And is the sample that was provided a representative sample of the full scope of product that may be shipped as part of the project?
21460. **DR. HEATHER DETTMAN:** What we received are two examples - - two, you know, products that are put into the pipeline and so they are -- they were pulled from -- you know, they could've been in the pipeline but no they came into the barrels, they came to us.
21461. So there are two samples. There -- there's kind of a matrix of different mixtures and so both of these ones were dilbits. We don't have a -- say, a synbit sample at this point for instances. And so with what we're starting these are our first two. We will look for getting samples of other classes so that we can basically have -- sort of peg out the extremes of what it can be, with time.
21462. **DR. BRUCE HOLLEBONE:** If I can just add a bit to that. When -- your concern about representative samples is well-founded. We want to be sure that if we do do work it isn't just representative of one particular project or another but it is representative of the production that is currently -- as it currently exists within Canada, so we're not targeting one particular set of producers.
21463. And in fact the samples that my colleague alluded to did not come from the Proponent. They came from another source which I don't know if we're able to talk about yet although that will probably get published.
21464. But we're also working with some of the industry associations to ensure that, in terms of market volume, in terms of what's being shipped, we're going to be getting samples that are representative of what would be available to the marketplace in the future.
21465. **MR. McCORMICK:** Has either NRCan or Environment Canada confirmed that the samples provided would fit within the tariff specifications for this project?

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21466. **DR. HEATHER DETTMAN:** Those are part of the tests that we're measuring on it so we will know. Because that's -- we do density, viscosity and that's just the beginning sediment, the S&W, those tests are part of the suite of tests that we're doing on it. So it will -- we will confirm it -- or measure it.
21467. **DR. BRUCE HOLLEBONE:** Yes and again we are -- sorry Bruce Hollebhone here.
21468. We are working with industry to gather sources from their analytical facilities as well so that we'll have a cross-check between industrial and government sources there.
21469. **MR. McCORMICK:** Now, we appreciate that some of the studies that you've been referring to will take some time and understanding that the work in relation to this product has been going on for many years and that as a result of the time that may be taken to complete these studies it may not be available to the Joint Review Panel for their consideration in making a decision on this project.
21470. Was there a reason provided or is there a clear reason why these products were not provided to government at an earlier date?
21471. **DR. HEATHER DETTMAN:** Heather Dettman from Natural Resources Canada.
21472. In terms of getting these kinds of samples at our research facility in Devon, we have had these kinds of samples for years and years and years and years. You know, doing various research for various kinds of issues, or characterizing, or -- you know, because we collaborate with industry associations and they have research programs going on and whatever.
21473. So it's -- we've had these samples but to have it specific for what we do to then be compared with what Environment Canada does and DFO, we haven't had this interdepartmental approach before. So this is what we are starting now.
21474. **DR. BRUCE HOLLEBONE:** Yes, just Bruce Hollebhone to follow-up.
21475. I think again we need to say the approach government is taking on this

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- is that this is not the only proposal that is going to be coming before government in the next little while. There are many proposals on the west coast and on the east coast. We are getting requests from our American partners for information as well.
21476. We have a memoranda of agreement between Canada and the U.S. and a long-term of collaboration on these sorts of matters between the various federal agencies in both countries.
21477. So the feeling when we were planning this forthcoming work, was that this was in the national interest and not specific to a single project. And so the work that we would do would be in the Canadian context rather than in the context of a single project.
21478. So the work we'll do will not be targeted towards a single -- answering a single set of questions but to answer questions as they might arise on any project or in any spill of this product, whether it be by rail, by pipeline or by ship in the future.
21479. **DR. HEATHER DETTMAN:** And I would say that this will actually add to knowledge for the world because more and more there are heavy oils and bitumens from around the world that are -- that are going around in tankers right now.
21480. And really an interesting thing is that, okay, I'm used to working with petroleum industry and we have a certain language for talking about and describing it. As I get to know my Environment Canada colleague from the environmental side they have a whole different set of -- language.
21481. And so as much as anything it's going to be an integration of the two perspectives of looking at it so that we all understand what each other's talking about. And then to actually extend the current knowledge, people really base everything on conventional oil. And there's a lot of non-conventional oil out there and so we can actually add to the global knowledge of how to -- of what to expect from the heavier oils, so it's timely for the world.
21482. **MR. McCORMICK:** We're very glad that NRCan and Environment Canada are looking at these issues.
21483. Dr. Dettman, I believe you mentioned that NRCan had been in

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- possession of I think it was “these kinds of samples for quite some time”. And noting Dr. Hollebhone’s comments about representativeness and the assessments that are done to ensure that they are representative and meet the tariffs, am I correct in my assumption that those samples have not been assessed to determine whether they would meet the tariffs or be representative of the products that will be specifically shipped as part of this project?
21484. **DR. HEATHER DETTMAN:** For the particular experiments that we do we always start with that type of measurement. And so -- let’s see. Our lab was not doing tests in a -- not in a format like say what’s offered by crudemonitor.ca.
21485. Like if you go to that website the sole purpose is to be documenting what’s going out and so you get this ongoing monitoring of the density and, you know, the S&W contents et cetera that’s on the website.
21486. We are not regulatory and monitoring that on an ongoing basis for that purpose.
21487. We are a research facility and so, for instance, if they have some questions about measurements in a particular defined situation that the industry might have or groups would have, we would collect samples as provided to us. And sometimes it’s like the diluent with the bitumen and they want to understand how the mixes will vary with concentrations or whatever so we will actually mix them in our lab to make it. Or another time we’ll get an actual sample and look for what we’re looking at.
21488. So we always had some kind of a research angle to it to be looking at not specifically for that meeting of specifications and so crudemonitor.ca is doing that right now and I presume NEB would have their way of measuring it. But we are not part of that aspect. Ours is for knowledge development.
21489. **MR. McCORMICK:** Does either Environment Canada or NRCan have any studies or test results that would be relevant to the fate and behaviour of the particular products to be shipped as part of this Project which have not been shared with the Joint Review Panel for consideration?
21490. **DR. BRUCE HOLLEBONE:** The information that we do have I believe was filed as part of our evidence or, actually, one of our IRs, I believe. I can give you the exact evidence number if you want it.

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21491. But all of the information we have to date on this product is in evidence.

--- (A short pause/Courte pause)

21492. **MR. McCORMICK:** And I believe, just when we looked briefly at the AQ that was up, we noted that Mr. Fingas -- or I believe it's Dr. Fingas -- had conducted some studies that we believe to be part of his work with Environment Canada which indicated that bitumen did, in fact, sink.

21493. Has the information relating to those studies been shared with the Joint Review Panel?

21494. **DR. BRUCE HOLLEBONE:** I don't know if it's been filed directly as evidence.

21495. It is the -- I think the paper that Merv is talking about -- well, there are probably two. There was an Orimulsion -- an Orimulsion product which is published as an Environment Canada report. I don't know if that -- I mean that has sort of -- that's the Orinoco bitumen Venezuelan product.

21496. So we didn't feel that was directly relevant to the products under consideration as our emulsion's a fairly different thing from -- from the product -- the dilbit products under consideration.

21497. The 2006 report on sinking of bitumen I don't believe has been entered into evidence but it is a publicly available paper and has been for six or seven years now in the peer-reviewed literature.

21498. **MR. McCORMICK:** Thank you, Dr. Hollebhone.

21499. In Kalamazoo, following the large spill from an Enbridge pipeline, the EPA formed a Submerged Oil Science Group as well as a Submerged Oil Task Force to assist in understanding the fate and behaviour of submerged oil in Kalamazoo.

21500. Has any of the information from those groups been shared with Environment Canada or examined by Environment Canada?

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21501. **DR. BRUCE HOLLEBONE:** I was a member of the Submerged Oil Working Group.
21502. **MR. McCORMICK:** We understand from our view of some of the EPA documents that there had been a recommendation made regarding the testing for submerged oil, oil at various temperatures, and they noted that testing shouldn't be conducted at temperatures below 60 degrees Fahrenheit or 15.56 degrees Centigrade because sunken oil wouldn't liberate or cause a sheen to rise to the surface of the water.
21503. Are you aware of that research and the directive of the EPA regarding minimum temperatures for testing for submerged oils?
21504. **DR. BRUCE HOLLEBONE:** Yeah, you're actually -- this is actually a bit more complicated than just release.
21505. The technique that was used in Kalamazoo -- Kalamazoo's a fairly shallow river. It's never more deep than about, I think, 20 feet at the deepest point and, in most cases, about 10 feet. So the option that they chose for detecting oil on the bottom was to take a long pole with a disc on the bottom and then, using a sort of repeatable method, ram -- ram the pole into the bottom to liberate the oil off of the bottom.
21506. This then would sheen up to the surface and they would sort of assess the amount of submerged oil on the river bottom by how much sheen came up. And the -- the document you're referring to was with reference to this kind of testing. They found that, if they did this testing at below 50 degrees particularly, Fahrenheit which is about 15 centigrade I believe, they -- they were finding that they weren't getting a representative volume of sheen coming up from the bottom.
21507. So that's what this is referring to. They were trying to make recommendations to their response staff to say when you do your assessments the water temperature has to be greater than this otherwise you won't get an accurate assessment of what's on the bottom.
21508. They were still seeing sheening even at zero, natural sheening. It just wasn't happening in a fast enough manner that they could get a representative count of what they needed to do the response operations.
21509. So thus this protocol was developed.

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21510. **MR. McCORMICK:** No, that's very helpful, Dr. Hollebhone.
21511. So you would agree with me that the effectiveness of some response measures to locate submerged oil may be affected by water temperature?
21512. **DR. BRUCE HOLLEBONE:** This one in particular, yes.
21513. **MR. McCORMICK:** And would Environment Canada agree that the water temperatures in the CCAA and OWA are almost always below 15 degrees Celsius?
21514. **DR. BRUCE HOLLEBONE:** That's my understanding based on what I've seen in the proposals -- the proposal documents, yes.
21515. **MR. McCORMICK:** And in the event that oil were to release and were to sink, the low temperatures we have present in the Project area could present difficulties in respect to this, detecting and recovering the sunken oil; is that correct?
21516. **DR. BRUCE HOLLEBONE:** That's a different set of questions because there was, as I've described, this peculiar set of conditions in the Kalamazoo River where this physical disturbance method was being used to detect the oil.
21517. There are other approaches to doing so that aren't reliant on temperature.
21518. **MR. McCORMICK:** We understand from previous information provided by I believe it was Panel 1 that water temperature and salinity will play an important role in the fate and behaviour of spilled oil.
21519. Are there any characteristics in the water around the Kitimat area and the Confined Channel Assessment Area that would tend to make submergence of spilled product more likely?
- (A short pause/Courte pause)
21520. **DR. BRUCE HOLLEBONE:** Sorry for the delay, we were just trying to coordinate who would answer what part of this question. I think we

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- need to think about this as multi-parts and we'll discuss this in a second.
21521. The effects of temperature and salinity in particular do affect things like emulsion formation and that can affect the behaviour of the -- and likelihood of the oil to increase its density or to -- I wouldn't say potentially get to -- it could potentially get to a state where it's overwashed.
21522. My -- the chemistry of the oil can change, and this is again what I was talking about with rates of change and evaporation yesterday. Dissolution would also play a role, photo oxidation would also play a role.
21523. In terms of specific site conditions here, temperature would probably be the most important one in terms of the actual physical changes to the oil, although potential for salinity difference would be important as well.
21524. And maybe my colleague, Dr. Khelifa, can talk more about the particular environmental conditions here.
21525. **DR. ALI KHELIFA:** Thanks Bruce. This is Ali Khelifa, Environment Canada.
21526. So as Bruce mentioned, there are different processes and if my understanding, you are referring to specifically to temperature and salinity. We have expert also here, our colleague Chris, he's -- he does have knowledge on these parameters -- the variability of these parameters in the study area.
21527. So following up with the -- to follow-up with what Bruce was mentioning, so these are chemistry aspects, I think to address the submergence of the oil, it's not wise to focus on specific parameters. There are chemistry parameter -- processes and there are physical processes as well, like waves, interaction with waves and so on; stratification is there freshwater there or not and so on.
21528. And maybe I'll pass the -- to Chris to give more information about the two parameters that he mentioned, temperature and salinity in the study area.
21529. **MR. CHRIS DOYLE:** Thanks. Chris Doyle, Environment Canada, Meteorological Service.
21530. I can't say I've looked actually at the water temperature data to any

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- great extent, certainly not the climatology of it, although I agree that it would rarely, if ever, exceed 15 Celsius.
21531. **MR. McCORMICK:** Thank you, gentleman.
21532. Dr. Khelifa, would you agree that lower surface water salinity would tend to make submergence more likely?
21533. **DR. ALI KHELIFA:** Well, if we -- Madame Chair, if we spill any liquid into another liquid, the density of two liquids -- the differential density of the two liquids matters. And I'm referring to freshwater here, freshwater has lower density than the seawater density and the differential density will be different of course. So it's a general statement.
21534. **MR. McCORMICK:** Thank you, Dr. Khelifa.
21535. Perhaps we can take a brief look at some evidence which helps to understand the temperature and salinity profiles within the CCAA. Madame Clerk, could we please see Exhibit B16-26, page 24, please?
21536. And we're looking at the sentence that begins with, "The temperatures and salinity profiles in the CCAA..." I believe it's right below the subheading 3.3.2, "Temperature Salinity Distributions".
21537. It appears from this paragraph that there are density gradients and water stratification in the CCAA. If a hydrocarbon with a density close to that of saltwater were to spill into this kind of environment where there is freshwater lens floating on a more saline water, what are the possible trajectories for that oil?
21538. **DR. ALI KHELIFA:** Give me a second to read the paragraph.
21539. **MR. McCORMICK:** Certainly, Dr. Khelifa.
21540. **DR. ALI KHELIFA:** Are you referring to section -- first paragraph in section 3.3.2?
21541. **MR. McCORMICK:** Yes, and particularly the first sentence.
21542. **DR. ALI KHELIFA:** And what's your question again? Trajectory prediction, that's your...

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21543. **MR. McCORMICK:** Yes, trajectory of a hydrocarbon with a density close to that of saltwater.
21544. **DR. ALI KHELIFA:** Madame Chair, I would not -- let's answer this question in a general way. In the spill modelling -- let's call it state-of-the-art spill modelling where three dimensional processes should be considered and they are considered. They are models, our state-of-the-art models are three dimensional. What that means -- what's happening in the water column is taking into consideration. If there is stratification, it will be considered.
21545. And in this spill modelling, to predict the trajectory, there is a need to do something -- to start with very important modelling which calls the hydrodynamic modelling or ocean circulation modelling, and what that part does is to predict how the water is moving in three dimension. I would say in four dimension there is the time as well.
21546. And that -- the results of that part is an input to the trajectory or oil spill trajectory modelling. So if the results of that is telling that an object that is there -- spilled there on the surface it's likely to go down, it's going to be tracked. On the top of that, there is also the properties that we gather from chemist, from the fate and behaviour side, like variation of density with temperature and so on.
21547. These are inputs to the model. So again, three dimensional models take into consideration this kind of stratification and it's not only salinity, temperature as well.
21548. **MR. McCORMICK:** Are there circumstances where oil may submerge but doesn't necessarily sink all the way to the bottom?
21549. **DR. BRUCE HOLLEBONE:** I'll take that as I've done work on that.
21550. Yes, we call that condition overwashed. The -- meaning that it is essentially neutrally buoyant. I will note though that that's a fairly complicated topic. As you've seen here with stratification, you can get that kind of condition happening at certain points but not at others in the water column. So...
21551. **MR. McCORMICK:** And is the witness panel aware of any effective techniques for detecting and tracking submerged oil that has not sunk entirely to the bottom?

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21552. **DR. BRUCE HOLLEBONE:** There are techniques and maybe Coast Guard will want to talk about this as well. Maybe not, I don't know.
21553. Environment Canada, in concert with Transport Canada, runs a program called the National -- NASP, a system of over-flights for tracking oil from the air. That's probably one of the best tools for doing this because even oil that is slightly submerged or just at the surface of the water can be seen from the air much more readily than it can be seen from a low angle on a ship for example.
21554. And that was used very successfully to track oil that was riding very low in the water in the Gulf oil spill for example. When the oil emulsified during the Gulf oil spill, it could become overwashed and difficult to see from a ship but could be tracked very successfully from the air because there was only a thin layer of water covering the oil. So in that case, that's the sort of approach you can take.
21555. If the stuff is entrained into the water column, that becomes a little more difficult but there are some techniques internationally, and have been used in Canada as well, to look at tracking oil in the water column too.
21556. And actually, I've just been reminded of my colleague on the line, Dr. Carl Brown who is a remote sensing expert, in fact.
21557. Carl, do you have anything to add?
21558. **DR. CARL BROWN:** No, I think you've done a good job there Bruce. Certainly being able to see things from the deck of a vessel is very difficult and once you're up in the air it's much easier to see.
21559. It is a difficult task to look for oil that's -- you know -- depths below, a couple of metres, depending on what the water clarity is.
21560. **MR. McCORMICK:** Thank you.
21561. And am I correct in my understanding that if you're observing from the air that will be -- the effectiveness of that approach will be dependent on things such as visibility, weather conditions, sea state; is that correct?
21562. **DR. CARL BROWN:** It's Carl Brown.

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21563. Yes, all of those things would affect your ability to see oil in the water.

21564. **MR. McCORMICK:** Thank you.

21565. And understanding that planes move at a different speed than oil when it's released into the marine environment, am I correct in my understanding that it may be difficult if you were to lose the position of the oil it may be difficult to once again relocate it?

21566. **DR. CARL BROWN:** That would be difficult, possibly, but it's not moving that quickly in the water.

21567. **MR. McCORMICK:** And can you conduct these visual observations from the air at night or is it limited to when natural light is available?

21568. **DR. CARL BROWN:** It would depend on what technologies you're using. Obviously if you're using a visible technology you can only do that during the day. If you're using something like an infra -- or sorry, an ultraviolet technology you rely on reflected ultraviolet light which requires that the sun is out, so that as well only works in the day.

21569. Other technologies, such as radar, work irrespective of whether it's day or night, so those are technologies that could be used at night.

21570. **MR. DONALD ROUSSEL:** Madame Chair, if I may, on the NAS programs we have technology to operate those planes in cloud covered situations and we've been detecting oil from ships around the country in these conditions. So visual of course is a -- full visual is of course the best conditions but the plane can operate in different types of conditions to track oil.

21571. **MR. McCORMICK:** Are you referring to sonar, Mr. Roussel?

21572. **MR. DONALD ROUSSEL:** Yeah, the suite of equipment that are on board the NAS plane, and they are, like it's been mentioned, ultraviolet camera, sonar type of operation, radar type of operations.

21573. **MR. McCORMICK:** Would you agree that there are high degrees of false positives associated with the use of some of those technologies?

21574. **DR. CARL BROWN:** Carl Brown.

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21575. Are you asking me that question?

21576. **DR. BRUCE HOLLEBONE:** Carl, I think you could add to that question, if you will -- if you would.

21577. **DR. CARL BROWN:** Sure. Yes, certain types of remote sensing technologies are susceptible to false positives, but for that very reason that's why Transport Canada uses a suite of sensors. So if you get detection of oil on more than one sensor it increases your confidence that you are really looking at oil and not a false target.

21578. **MR. McCORMICK:** Thank you, Dr. Brown.

21579. Dr. Hollebhone, when oil is submerged does it modify the fate and behaviour?

21580. **DR. BRUCE HOLLEBONE:** Yes, it does, or yes, it can.

21581. **MR. McCORMICK:** And how is the current state of knowledge within Environment Canada relating to the fate and behaviour of submerged oils in conditions similar to those we will see in the project area?

21582. **DR. BRUCE HOLLEBONE:** I would have to say -- we talked about this a bit yesterday -- in terms of the -- our plans for both our regular line research and our provisional plans right now for enhanced research, and I would simply say that they're under active development.

21583. **MR. McCORMICK:** And would the witness panel agree that subsurface currents may play a large role in determining where oil -- submerged oil may go?

21584. **DR. BRUCE HOLLEBONE:** That's correct.

21585. **MR. McCORMICK:** And has Environment Canada conducted investigations or considered information relating to the subsurface currents in the CCAA or OWA that might affect the movement of submerged oils?

--- (A short pause/Courte pause)

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21586. **DR. BRUCE HOLLEBONE:** My apologies, we were just trying to determine if the expertise was present on the panel to answer this question.
21587. Environment Canada does not measure hydrodynamic data. In general that comes from the Department of Fisheries and Oceans. But I'm not sure the experts are here on the panel today to discuss that.
21588. **MR. McCORMICK:** Is someone available from DFO to confirm whether or not DFO has the available expertise present on the panel?
21589. **MR. THOMAS KING:** Tom King from DFO.
21590. And the answer is no, we don't.
21591. **MR. McCORMICK:** Thank you, Mr. King.
21592. I'm noting some of the previous statements from Dr. Hollebhone and Dr. Dettman that the approach that will be taken to the further research on fate and effects of -- or fate and behaviour -- excuse me -- of the products that are going to be shipped is an industry-wide approach.
21593. In conducting those further studies, will Environment Canada include, as part of its research and assessments, the information that has been gathered relating specifically to the marine physical environment that might be affected as part of the present project?
21594. **DR. BRUCE HOLLEBONE:** I think what we need to make clear here is that -- I appreciate your question, but I think what we need to make clear here is we have made specific recommendations to the Proponent in terms of information gaps we felt were needed to be filled in terms of the proposal and that those requirements are specific to this project and specific to the work that we felt would be necessary to do some of the necessary activities we have to do in terms of consequence analysis or spill response preparedness in terms of this specific project.
21595. The general context that we're talking about for our expanded research is, as you've said, in all government approach, to look at national issues rather than a specific set of issues here.
21596. So I think we need to draw that distinction, that what we're looking for

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from -- in terms of our evidence, in terms of the recommendations we've made, is the specific information on the products shipped, the general location -- the location of the product -- sorry, the location of the project that comes out of this Application and so with that distinction made between our future plans and what our evidence here is before the panel.

21597. **MR. McCORMICK:** Thank you, Dr. Hollebhone.

21598. And from what I understand, you're saying we're hoping that Northern Gateway will provide the necessary information to permit those evaluations.

21599. Is it also true that Environment Canada won't independently conduct assessments that are specific to the marine conditions in the Project area?

--- (A short pause/Courte pause)

21600. **DR. BRUCE HOLLEBONE:** Okay. Sorry, we're trying to sort this out here.

21601. I think the perspective we would put on this is that we have made certain recommendations to the Panel with regards to provision of evidence, and part of those recommendations have been to form a science advisory board and Environment Canada certainly sees a place for itself on that science advisory board.

21602. And I think that would be one of the strongest ways we would interface with the Proponent on -- in terms of the research that we've recommended or the information gathering that we have recommended take place.

21603. In terms of the broader question of our future plans, again, we do have this national approach and part of that national approach would indeed include issues relevant to B.C. So we do have plans which would address some of these concerns but not in the level of specificity that we were looking for from the Proponent on this Project.

21604. **MR. McCORMICK:** That's very helpful, Dr. Hollebhone. Thank you.

21605. Looking again at the first paragraph we see here under "Temperatures, Salinity Distributions" -- so the reason we brought that up is because we've got a

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distribution of temperature and salinity profiles that has an upper layer ranging from 10 to 15 metres depth and it is our understanding that that may contribute to the possibility that -- well, if oil were to submerge, that upper layer could be relevant to what depth the oil would submerge to.

21606. Am I correct in my understanding?

21607. **DR. BRUCE HOLLEBONE:** Yeah, that would certainly be a consideration we would look at when trying to figure out what the oil might do in this particular case, yes.

21608. **MR. McCORMICK:** Thank you.

21609. And in the event that oil were to submerge to the range we see here, 10 to 15 metres, what containment techniques would be available to respond to those circumstances?

21610. **MR. ERIK KIDD:** Erik Kidd, from Transport Canada.

21611. Can you repeat the question again, please, in relation to EC's statement?

21612. **MR. McCORMICK:** Certainly.

21613. The question was about: If oil were to submerge and were to submerge to the depths that we see here based upon the layers of salinity and temperature within the water -- essentially, for the purpose of the containment question, if oil were to go down 10 to 15 metres, how do you contain that?

21614. **MR. ERIK KIDD:** I'm hearing that question and it seems rather speculative in nature and I'm not sure that, at this point in time, that that behaviour of the oil is consistent with ongoing evidence that's being produced about it.

21615. **MR. DONALD ROUSSEL:** Madame Chair, if we want to have a meaningful discussion on the -- on this matter, we have to start with a specific product.

21616. And I think it's been highlighted by Madame Mathers, crudemonitor.ca; it was highlighted by Douglas Channel this morning where we

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were talking on a specific product on the screen.

21617. So the approach taken by the intervenor at this juncture is entirely speculative. CrudeMonitor.ca will -- if we take a cold lake example -- will tell us that the product will be on board the ship with the specific gravity of 0.23 -- 0.923. So this type of product will float in freshwater and float in seawaters.
21618. If we want to engage into further discussions on the behaviours of the product for response purposes, we need then to engage on how fast this product will deteriorate in sea temperatures of less than 15 Celsius.
21619. That's been Madame Mathers or any other need to explain how long it will take for the lighter dilutant -- in particular, butane, pentane, hexane -- and which temperatures we need to have so that these products start to evaporate and what will be the resulting density of these product.
21620. In response to -- in the response regimes, we do recuperate the oil that we detect and the information we have is that these products, when going to hit the water, will float, will increase in density but may still be in a flotation stage.
21621. And we have no further information at this stage unless these products will accumulate aggregate -- like it was explained yesterday -- that it will sink. And if it sinks, it's going to be on the shore and it will be recovered mechanically.
21622. **MR. McCORMICK:** Something to add, Mr. Kidd?
21623. **MR. ERIK KIDD:** I'd just like to explain that we have rather limited world expertise, Madam Chair, in this, recovery of these particular products.
21624. But we do have two examples which have been discussed today by my colleagues in Environment Canada and one of them is the Westridge Terminal pipeline spill that ended up into the marine environment in what's called a "sheltered and shoreline environment" with respect to the response regime that Transport Canada oversees.
21625. The product, when it entered the water from the shore, was recovered with a great success and none of the oil was found to have become neutrally buoyant or have sunk.
21626. **MR. McCORMICK:** Thank you, gentlemen.

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21627. Am I to understand from your response that Transport Canada is only preparing to respond to oils that may float?
21628. Or is Transport Canada also preparing to respond in the event of a spill to oils that may submerge?
21629. **MR. DONALD ROUSSEL:** We're in the position to respond to the deteriorations of specific products with appropriate science-based discussions.
21630. That means we need to know the quantity of product we will be dealt with and if some of the product -- and it was explained yesterday very well by Dr. Hollebone, the world is not black and white. These things don't touch the water and start sinking on you. There is mechanism of emulsifications, accumulations and so forth.
21631. So, Madame Chair, what we're dealing with is that we need to be able to see how this product deteriorates.
21632. And there might be a decision for some of the product that submerge, particle in the waters or small amount that may submerge, following discussions with Environment Canada that is some things where you will not be dealing with in recovery for all sorts of ecological reasons. You may decide that these elements are so illegible that you will not engage in recovery.
21633. So to start the discussions, you've got to take us to a specific product and then we have to see the percentage of potential deteriorations in a meaningful scientific discussion and then see how these things will end up, what will be the end result.
21634. So what we detect, we find, there's mechanism to recovery.
21635. **DR. BRUCE HOLLEBONE:** I'd just like -- Bruce Hollebone here, for Environment Canada.
21636. I'd just like to amplify on my colleague's comments that it is not the position of Environment Canada that this product will absolutely sink in any spill. Our statement at this point is that there is this possibility based on the certain characteristics of the material and our position really is that we don't know enough to make that assessment in a quantitative way and so many of our

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- recommendations and many of our future plans for research are aimed at answering those questions.
21637. But I think the fair statement we can make right now is it is very difficult to make that assessment on any particular given spill given our current state of knowledge and that, going forward, what we need to obtain both from the Proponent and from future work that we might do ourselves or others is that ability to predict the behaviour in the long term.
21638. And it's that rate of change argument that I was talking about earlier that is key to these kinds of questions.
21639. **MR. McCORMICK:** Thank you, gentlemen.
21640. So I understand ---
21641. **MR. ERIK KIDD:** Excuse me. Pardon me.
21642. **MR. McCORMICK:** Oh.
21643. **MR. ERIK KIDD:** Madam Chair, may I, please?
21644. **MR. McCORMICK:** Mr. Kidd?
21645. **MR. ERIK KIDD:** I just want to make a correction that TC does not respond. We certify response organizations to respond to it; okay? Thank you.
21646. **MR. McCORMICK:** Is TC the appropriate party on the witness panel to discuss response operations?
21647. **MR. DONALD ROUSSEL:** We are the certifying body.
21648. **MR. McCORMICK:** And as the certifying body, does TC have the capacity to provide information today regarding actual spill response operations or are you limited to certification processes?
21649. **MR. ERIK KIDD:** TC can -- is able to discuss the certification processes that you're referring to.
21650. **MR. McCORMICK:** Thank you.

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21651. And I believe -- excuse me if I'm slightly confused -- from what I understand from Dr. Hollebhone is that, while Environment Canada's position is not -- I'll attempt to use his words, but there's no -- that Environment Canada hasn't taken the position that this product will absolutely sink.
21652. But I also understand that there's an information gap or further studies that need to be undertaken to assess whether or not it will sink or submerge and that that information is currently not certain.
21653. Is that correct?
21654. **DR. BRUCE HOLLEBONE:** That's a fair characterization of where we are in our evidence, I think.
21655. **MR. McCORMICK:** And, Mr. Roussel, on that basis, we have Environment Canada telling us that there is a risk that these products could sink or submerge and that it currently is an unknown, is Transport Canada, when considering the specific response measures, limiting itself to consideration of the floating oils or are we also considering the possibility that it will sink or submerge and will need to be responded to in those circumstances?
21656. **MR. DONALD ROUSSEL:** Yeah, we will be looking at all the evidence base when it's come to certification bodies. But we get to base it on evidence.
21657. And the information we got on this product that has been shipped at this moment is that those product float. They're lighter than seawater or freshwater.
21658. **MR. McCORMICK:** Mr. Roussel, I'm going to submit to you that Transport Canada, within the response organizations that it may certify, does not currently have the capacity to effectively contain oil that may submerge to a depth of 10 to 15 metres.
21659. Would you agree with me?
21660. **MR. ERIK KIDD:** Erik Kidd from Transport Canada.
21661. Madam Chair, referencing the last conversation we had of the

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- Westridge Terminal spill, specific strategies were in -- placed in the marine environment to recover oil at that depth, yes.
21662. **MR. McCORMICK:** Could you please tell us what strategies were used to recover the oil at those depths?
21663. **MR. ERIK KIDD:** Erik Kidd from Transport Canada.
21664. The response organization placed what are called “oil spill pom poms”. So a great surface area of them and they put them into the water column various distances apart to recover any oil that potentially submerged.
- (A short pause/Courte pause)
21665. **MR. ERIK KIDD:** And if I may, they’re no relation to cheerleader pom poms, just to -- for the record.
- (Laughter/Rires)
21666. **MR. McCORMICK:** And the use of that recovery technique in those -- in that circumstance, was that -- have the operational limitations of that particular recovery process been determined?
21667. **MR. ERIK KIDD:** I can speak to the fact that it was used in a shoreline situation so to about a depth of maybe 30 or 40 metres.
21668. So no specific limitations were specified. It was also in what’s termed as a “sheltered water environment” operating environment as well.
21669. **DR. BRUCE HOLLEBONE:** If I could bring up the example of Kalamazoo as well, there were sub-surface containment areas used in that situation as well with curtain booms and geo-tech style fabrics being used to direct and trap sediments in certain areas.
21670. So there are technologies to do that sort of work.
21671. **MR. McCORMICK:** Madame Clerk, could we please briefly pull up Exhibit E9-21-12 at page 71?
21672. This is the response to Haisla Nation IR No. 1 and we note there’s a

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response provided by Environment Canada and it relates to -- if we could please go down just a little bit further -- a little bit further and the last paragraph above paragraph -- or last, yes, last paragraph above Section 1.39b.

21673. And the last sentence indicates:

“Recovery and mitigation options for sunken oils are limited.”

21674. This was prepared some time ago, is this still the position of Environment Canada?

21675. **DR. BRUCE HOLLEBONE:** This was written prior to my experience on the Kalamazoo spill when we had -- many of these techniques were, in fact, pioneered.

21676. So based on the experience and the outputs coming out of that which will probably start to be published in the next few years, we have learned from that experience, yes.

21677. **THE CHAIRPERSON:** Mr. McCormick, I note the time, is this is a good time to take a break for lunch or have you got -- would you like to finish up on a particular line of questioning before we do that?

21678. **MR. McCORMICK:** I think a break would be just fine, Madame Chair.

21679. **THE CHAIRPERSON:** Let's take our lunch break and be back for 1:00, please.

21680. Thank you.

--- Upon recessing at 11:59 a.m./L'audience est suspendue à 11h59

--- Upon resuming at 12:59 p.m./L'audience est reprise à 12h59

21681. **THE CHAIRPERSON:** Good afternoon, everyone.

21682. Are there any preliminary matters parties wish to raise as we get underway for this afternoon?

21683. **MS. ANDERSON:** Madam Chair, yes, there is one preliminary

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matter.

21684. Mr. Esler has advised that he's reviewed the transcripts from yesterday. I'm sorry, I don't have the line number in front of me but I'm sure that my colleague does. He says that in answer to a question from Member Bateman he answered "thermo regulatory" but the transcript reflects "regulatory", which I understand is quite different.

21685. So we wondered whether you would want him to phone in for further questioning or if there might be any follow-up on that?

21686. **THE CHAIRPERSON:** I've checked with Member Bateman and there's no follow-up.

21687. Thank you for the clarification.

21688. **MS. ANDERSON:** Thank you, Madam Chair.

21689. **THE CHAIRPERSON:** Madame Niro, could we get an AQ number please for the Haisla Nation's questioning of this panel?

21690. **THE REGULATORY OFFICER:** It will be AQ92.

21691. **THE CHAIRPERSON:** Thank you.

**---AID TO CROSS-EXAMINATION NO./AIDE AU CONTRE-
INTERROGATOIRE No. AQ92:**

*Haisla Nation - Aids to cross-examination of the Government of Canada
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21692. **THE CHAIRPERSON:** Mr. McCormick, please continue with your questions of this panel.

GEORGE ARMSTRONG: Resumed
ANDRÉE BLAIS-STEVENS: Resumed
CARL BROWN: Resumed
KEVIN CARRIGAN: Resumed
JOHN CASSIDY: Resumed
CAROLINE CAZA: Resumed

JOSEF CHERNIAWSKY: Resumed
JOHN CLARKE: Resumed
KIM CONWAY: Resumed
HEATHER DETTMAN: Resumed
CHRIS DOYLE: Resumed
WAYNE DUTCHAK: Resumed
MICHAEL DWYER: Resumed
MICHAEL ENGELSJORD: Resumed
CHARLES HANSEN: Resumed
GRANT HOGG: Resumed
BRUCE HOLLEBONE: Resumed
ALI KHELIFA: Resumed
ERIK KIDD: Resumed
THOMAS KING: Resumed
GWYN LINTERN: Resumed
LAURA MACLEAN: Resumed
FRANÇOIS MARIER: Resumed
PHIL MURDOCK: Resumed
GLENN ORMISTON: Resumed
DONALD ROUSSEL: Resumed
PAUL TOPPING: Resumed
ROB TURNER: Resumed
SHANE WALTERS: Resumed

--- EXAMINATION BY/INTERROGATOIRE PAR MR. McCORMICK:
(Continued/Suite)

21693. **MR. McCORMICK:** Thank you, Madame Chair. Hello witnesses.
21694. Dr. Hollebone, you mentioned during some of the discussion prior to lunch a study or a report from 2006. We took a look for it and we couldn't find it, would it be possible to provide a citation for that report?
21695. **DR. BRUCE HOLLEBONE:** Okay. I think we'll do that as an undertaking if that works for you.
21696. **MR. McCORMICK:** That would be very helpful. Thank you.
21697. **THE REGULATORY OFFICER:** That will be U-80.

UNDERTAKING NO./ENGAGEMENT No. U-80:

For Dr. Bruce Hollebhone to provide Mr. McCormick with a citation for a study mentioned by him which was undertaken in 2006.

21698. **MR. McCORMICK:** Thank you.
21699. Just before I move on to the next topic of discussion, I'd just like to touch briefly on Dr. Hollebhone's comments in relation to Kalamazoo and spill response.
21700. Dr. Hollebhone, to your knowledge or the knowledge of Environment Canada, have any of the response measures used in Kalamazoo -- do any of them have demonstrated effectiveness in open water areas?
21701. **DR. BRUCE HOLLEBONE:** There was a -- there is a freshwater lake at the end of the Kalamazoo system that they were using as a control point in that case, and so many of the techniques that they had worked on were being used in that lake.
21702. I am not aware of any documentation that has come out yet on that, so lessons learned have not been yet written down. But I certainly know they were using those operations within the lake.
21703. **MR. McCORMICK:** And are you prepared to confirm at this time that those methods would be effective in the open water area of this particular project?
21704. **DR. BRUCE HOLLEBONE:** I don't know if I can really comment on that at this point. Lake Morrow is fairly shallow, so I don't know if that would be appropriate for the open water area at this point.
21705. **MR. McCORMICK:** And would it be the same circumstance for the confined channel assessment area?
21706. **DR. BRUCE HOLLEBONE:** Again, these techniques are very new; some of them were developed just last summer. So I think we would need to review them and I wouldn't want to give an off the top of my head kind of impression right now.

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21707. **MR. McCORMICK:** And would you agree that the weather conditions and the environmental conditions present in the project area may differ significantly from those present in the area of the Kalamazoo River?
21708. **DR. BRUCE HOLLEBONE:** Yes, the Kalamazoo River is a shallow river in the middle of continental U.S. The temperature regimes, the weather regimes are all very different. The sediment types would all be very different.
21709. While we can take some lessons there from that response, we do have to be aware that there are very -- every spill is very context dependant and the context of this spill was very different from northern B.C.
21710. **MR. McCORMICK:** Thank you.
21711. And to your knowledge, would it be possible to apply a sediment trap in the confined channel assessment area?
21712. **DR. BRUCE HOLLEBONE:** That's not my area of expertise, sorry.
21713. **MR. McCORMICK:** And would Environment Canada propose dredging in the confined channel assessment area as a measure to deal with sunken oil?
21714. **DR. BRUCE HOLLEBONE:** Now rather than getting into specific what if kind of scenarios, I'd have to reiterate that this is the kind of thing that needs to be done on a -- in an informed discussion knowing the area. I don't know the area very well. But knowing the area and having local knowledge, not only knowing the environmental knowledge but also the cultural significance, perhaps religious significance, perhaps commercial usage of the area. And this feeds in to that -- what I was talking about yesterday, the net environmental benefit decisions.
21715. Environmental in this case also includes, you know, the commercial usage, the cultural and religious significance of the areas, as well as the wildlife amenities.
21716. So whether we choose one technique over another technique would very much depend on what we're trying to achieve with that remediation technique. If we're trying to divert oil, if we're trying to contain it, if we're trying to clean an area to a certain standard, all of those decisions would be made with

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- advice from Environment Canada to the response organizations or the responsible party through our colleagues with the Coast Guard and DFO. All of those things would be a big -- a big mesh of consultation, as well as the local First Nations and other communities that would be involved, as we've heard from many of the intervenors.
21717. So when we're making that decision to do a certain operation, that's all done in this big consultative fashion and it's hard for me therefore to say we would use this technique or we would use that technique. I don't want to take anything off the table, but at the same time without a specific situation it's very hard to commit to saying we would do that in this case.
21718. **MR. McCORMICK:** Thank you, Dr. Hollebhone, we appreciate that might be challenging.
21719. Would it be fair to say that the effectiveness of any techniques for recovery or mitigation options for sunken oils that were developed in Kalamazoo, the effectiveness that those techniques may have in the open water area or the confined channel assessment area are not necessarily known at this point?
21720. **DR. BRUCE HOLLEBONE:** I think that's fair. I mean we have seen them in use and they have set evaluation in an operational way in that particular set of conditions for that particular spill.
21721. But as I said, the lessons learned from that have not yet been drawn in a formal way and have not been subject to review or scrutiny from other people.
21722. **MR. McCORMICK:** And just to add to that, and have not been applied or assessed in a particular environmental or geographical context of this particular project; is that correct?
21723. **DR. BRUCE HOLLEBONE:** That's true, yeah. There have been no occasions to use them so...
21724. **MR. McCORMICK:** Thank you, Dr. Hollebhone.
21725. I'd like to turn to another subject now and discussing some of the responsibilities of Transport Canada.
21726. And Madame Clerk, if we could please go to Exhibit B2010-2 (sic),

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page 3. My colleagues have helped me out here; it would actually be B210-2, page 3. Thank you.

21727. And I believe down the middle -- middle -- second or third column over you'll see an errata. It would be erratum number 5 at the bottom of the page. It refers to TERMPOL Section 3.11, Cargo Transfer and Trans Shipment Systems. It was an attachment to JRP IR 15.1, Commitments Table.

21728. Initially, Northern Gateway had committed to conducting ballast testing and this erratum shifts the responsibility to Transport Canada. It also eliminates some of the specific language, specifically where it had said:

“If the tests indicate the segregated ballast does contain evasive aquatic organisms ...”

21729. Has been changed to:

“If so directed by Transport Canada ...”

21730. Was Transport Canada aware that Northern Gateway had shifted responsibility for water test or ballast water testing from themselves to Transport Canada in relation to this erratum?

21731. **MR. DONALD ROUSSEL:** Is Paul Topping on the line with Mr. Marier? No, they're not there?

21732. **MR. PAUL TOPPING:** Yes, we are.

21733. **MR. DONALD ROUSSEL:** Oh, okay. All right.

21734. So, Paul, can you give the answer on this particular issue regarding our regulatory regime for ballast inspections?

21735. **MR. PAUL TOPPING:** Yes, I will.

21736. The ballast water control and management regulations require the vessel to manage its ballast water. The ballast water must be managed either by deep ocean exchange, onboard treatment, offloading at a facility or retention on board. One of these four management options must be chosen by the Master of the vessel to manage the ballast water.

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21737. Transport Canada marine safety inspectors, in conducting their port state control, validate that the regulations have been complied with. That's the overall -- at this stage -- management regime for ballast water.
21738. Canada is a signatory and has ratified the 2004 International Convention on the control and management of ballast water, ships' ballast water and sediments. This is known as the "Ballast Water Convention" which sets performance standards.
21739. So a treatment system onboard a vessel, in our regulations, has to meet these performance standards. The exchange at sea also has to meet a performance standard. So the validation that a ship has complied with the regulations is not only something like a document check where there's a record of the ballast water management kept on board by the vessel, but there is also a physical verification that can be done. It's very simple.
21740. It's a refractometer, a device that can be similarly used to check in the days when people worked on cars, of checking the density of batteries. What this device simply does is give an indication of the salinity, how much salt is in the water that's in the ballast water tank. What that in turn will do is tell you whether you've actually carried out a deep ocean exchange. They must have a 30,000 part per million concentration of salt in that water and that indicates deep-ocean exchange and that you're compliant.
21741. We do validate that and we've also encouraged the industry to acquire these densometers and conduct their own surveys of their own ballast water tanks beforehand, before the coming in, so that we have insurance that the ballast water is compliant.
21742. We have a program where, again, we're doing the inspections and we do these inspections nationally and we're observing a very high initial compliance, about 97 percent initial compliance.
21743. What we are seeing on that three percent is that we require action to be taken to correct the situation. So in many cases, the particular ballast tank that may have failed is not allowed to be discharged in Canadian waters or the vessel returns to sea and carries out the proper exchange. So, in a nutshell, this is an overarching view of our current system that we have in place.

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21744. The future changes that we've discussed that were in our evidence is having to do with the ratification of the Ballast Water Convention.
21745. So with regard to the statements by Enbridge about transferring responsibility to Transport Canada, the Proponent, this is part of our regulatory regime we administer and the responsibility rests with the authorized representatives. The owner and the Masters of the vessels coming in must comply with our regulations and have managed their ballast water.
21746. **MR. McCORMICK:** Thank you, Mr. Topping, that was very helpful.
21747. **MR. DONALD ROUSSEL:** Yeah, Madame Chair, if I may add, we also have a more specific program.
21748. For example, for the Great Lakes area where we do 100 percent of the visit of vessel there and we have, above the verifications onboard, a formal sampling system with an independent laboratory to check if -- beyond just the salinity, that there is actual physical invasive species in the water.
21749. And since we put that program in place, we're very proud to say that there were no new invasive species on the Great Lakes.
21750. **MR. McCORMICK:** Thank you, Mr. Roussel.
21751. Madame Clerk, could we please see displayed Transcript 162, line 7015?
- (A short pause/Courte pause)
21752. **THE CHAIRPERSON:** Mr. McCormick, could you confirm the line number, please?
21753. **MR. McCORMICK:** I have Transcript 162 -- oh, I'm sorry, we've mistaken it in our notes. It is Transcript Volume 161, line 7015.
21754. **THE CHAIRPERSON:** And the line number, Mr. McCormick?
21755. **MR. McCORMICK:** Yes, Madame Chair, the line number is 7015.

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21756. We may have to come back to this. We'll locate the appropriate reference and continue.
21757. Mr. Topping, would it be fair to say that the ballast water control and management regulations rely heavily on voluntary compliance?
21758. **MR. PAUL TOPPING:** ...it's based on the vessel owner.
21759. However, there is an inspection program that is in place to verify.
21760. **MR. DONALD ROUSSEL:** Madame Chair, if I may?
21761. When the regulation is in place, it's not voluntary anymore. It's mandatory and we have the mechanism, which is our compliance and enforcement programs, to make sure that it is happening.
21762. **MR. McCORMICK:** So the inspection processes form an integral part of the enforcement necessary to ensure compliance.
21763. Is that correct?
21764. **MR. DONALD ROUSSEL:** Yes, oversight and physical inspections.
21765. **MR. McCORMICK:** And how often will Transport Canada conduct inspections of tankers arriving at the Kitimat Terminal for this particular Project.
21766. **MR. DONALD ROUSSEL:** So in the -- in our tanker inspections programs, we want to make sure that every tanker who do their first visit are inspected, Madame Chair, and after that, every year thereafter.
21767. So that's the regime that's going to be in place; once a year thereafter.
21768. **MR. McCORMICK:** Thank you.
21769. And am I correct in my understanding that the parameters described by Mr. Topping would be the parameters that would be applied in those further inspections?
21770. **MR. DONALD ROUSSEL:** On the ballast -- in particular on the ballast water regime, yes, that's what you will see.

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21771. **MR. McCORMICK:** Perhaps we can try again with the transcript, Ms. Niro. We have volume -- we've pulled up on our computer here Volume 162, and the line number we see displayed is 70 -- oh, it's up on the screen. Thank you very much, Ms. Niro. We do appreciate it.
21772. If I can direct the attention of the witness panel to line 7015, this is Mr. Michael Cowdell, a witness for Northern Gateway, and he's referring to the change that we discussed earlier in relation to the erratum.
21773. As you can see here, Northern Gateway stated in hearings that they made the change because they didn't want to interfere with Transport Canada's role in upholding Canada's ballast water control and management regulations.
21774. Does Transport Canada agree that if Northern Gateway conducted mandatory testing of ballast water on all ships calling at Kitimat Terminal it would interfere with Transport Canada's work?
21775. **MR. PAUL TOPPING:** Paul Topping, Transport Canada.
21776. I would at this point say it's premature to state whether or not it would interfere with our work. It would depend on what parameters they would be checking, whether it is in line with the parameters that we in turn check. So at this point I could see at the stage that the Proponent is in in planning stages that they would wish to take care in their planning so as not to interfere with our regulatory enforcement activity, but at the same time it is something we could explore later.
21777. **MR. McCORMICK:** Now, I believe, Mr. Topping, you'd said earlier that Transport Canada encourages industry to conduct ballast water surveys as part of the steps taken to ensure that invasive species are not entering the Canadian waters.
21778. Perhaps you can help me understand a little bit better how Northern Gateway conducting testing would interfere with Transport Canada's role and how that would reconcile with Transport Canada's encouragement of industry to conduct ballast water surveys.
21779. **MR. PAUL TOPPING:** Again, I would state that if they are looking -- one of the areas where it is a possibility is if they choose to do testing of the

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- water looking at a range of, say, species that may or may not be indicative, this is biological testing that could be done in the future, we do not require it in our regulations now, but we work with Fisheries and Oceans on such testing to validate that the regulations are working and that we're seeing limited to no invasive -- potentially invasive species in ballast water.
21780. But areas where we can successfully work with other organizations are illustrated in the Great Lakes work that we have done. And, as an example, the Canadian St. Lawrence Seaway Management Corporation has inspectors that join Transport Canada along with the United States Coast Guard and the United States St. Lawrence Seaway Development Corporation. By having the combined inspections we attain 100 percent inspections of all ships coming through the St. Lawrence Seaway system at the Port of Montreal.
21781. So there are cases where, through combined work and with joint planning, where organizations can come together and they can assist and also ensure that the requirements are being followed.
21782. So each organization is working under their own authorities, however, the requirements are the same, they're coordinated, if you carry your -- the same requirements as we've outlined you're meeting then the Canadian requirements and the U.S. Coast Guard requirements at this point and as well as the U.S. St. Lawrence Seaway requirements.
21783. So you have to follow just one item and then there's a coordinated approach, but that each then inspector from the respective organization has their own authority to enforce their particular requirements, which is for the ship owner and for the vessel is the same thing, having exchanged at sea either onboard treatment, retaining things on board, or they're going to offload it at port.
21784. **MR. McCORMICK:** Thank you, Mr. Topping.
21785. And I'm not familiar with the Great Lakes work you've mentioned, but would it be fair to say that the Great Lakes project that is being undertaken by Transport Canada currently offers a more effective control of invasive species than would be available through the measures that have been proposed for the Northern Gateway Project?
21786. **MR. PAUL TOPPING:** I wouldn't say that, no. The project is under development and this is about enforcing our regulations which we do on a

- national basis.
21787. **MR. McCORMICK:** In your view, would it be an effective and appropriate measure to implement a similar system as part of the Northern Gateway Project?
21788. **MR. PAUL TOPPING:** Programs to assist in the validation of compliance can certainly be entertained and can help with the efficiency of ensuring the regulations are complied with, yes.
21789. **MR. McCORMICK:** Would Transport Canada require or request that ballast water testing facilities be incorporated into the Kitimat Terminal?
21790. **MR. PAUL TOPPING:** No, as these such facilities are not required in any other port in Canada. The test that is undertaken to ensure compliance of the regulation again is done in a very simple manner. The basic compliance approach for validation of the regulations is again through a refractometer, a very simply device that literally anybody can use, it doesn't require specialist training, and so it costs, in fact, about \$95. So we've, in fact, pointed out to the industry where they can do it and that's how they do their work.
21791. So if you're referring to more expensive biological validation, this is specialist work that's done by DFO on a select range of vessels that is basically to ensure and validate that the science advice that they had provided us on the exchange at sea is indeed working, and it is indeed that we're seeing, based on the fact that if you've done exchange at sea, you're not going to see the invasive species coming in, they wanted to validate that.
21792. So that was sort of part of their research that they've been doing and that they're then feeding back into our programs so that we have confidence that the measures we're taking are working.
21793. **MR. McCORMICK:** So from what you've told us, Mr. Topping, I'd understand that it would be quite easy for Northern Gateway to conduct those tests on the ships that are coming in. Would that be fair?
21794. **MR. PAUL TOPPING:** Based on the use of the refractometers, yes.
21795. **MR. McCORMICK:** And would the information gathered from the use of the refractometers be valuable to Transport Canada in ensuring that the

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regulations are complied with and preventing the introduction of invasive species to the project area?

21796. **MR. PAUL TOPPING:** Yes, they would.
21797. **MR. McCORMICK:** Thank you, Mr. Topping.
21798. **MR. PAUL TOPPING:** You're welcome.
21799. **MR. McCORMICK:** Mr. Topping, will the annual inspections -- I'm not sure if it was yourself or Mr. Roussel -- that would be required for the project for ballast water, would they include ballast tank inspections?
21800. **MR. PAUL TOPPING:** Ballast tank inspections are part of the compliance inspections with port state control and they can be done on a variety of things. If there's indications there's construction issues with them as part of the port state control annual inspections ballast tanks can be inspected, as Mr. Roussel stated.
21801. Ballast tank inspections could also be part of a compliance check which would be done based on the vessel visits that if they are -- if there is a suspicion that the ballast water is not compliant a further tank inspection could be undertaken to ensure that there's no invasive species being taken.
21802. **MR. McCORMICK:** Thank you.
21803. And if a vessel happens to fail the Transport Canada inspection, would that information be reported to SIRE?
21804. **MR. PAUL TOPPING:** SIRE, at this point, is something we're looking at but it's not part of -- it's not what we're -- our -- we're doing a program right now under the port state control and we also report based on our national ballast water inspections program.
21805. What we do with failures, that is, we take corrective action to prevent the release of invasive species and this corrective action is taken immediately. A vessel would be required to either undertake exchange, offload its ballast water to port as opposed to discharging it in the water. Or retain the vessel -- retain the ballast water onboard the vessel so that they could not discharge it.

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21806. We are also looking into approaches to add brine water to immediately raise the salinity -- the amount of salt in the ballast water to shock and kill any organisms that would be in place in the ballast water tank. So these are options we're looking at to ensure corrective action is taken.
21807. **MR. McCORMICK:** And thank you, Mr. Topping.
21808. And has Northern Gateway informed Transport Canada whether it intends to have the facilities available to permit discharge of ballast water to port?
21809. **MR. PAUL TOPPING:** Not to our knowledge.
21810. **MR. McCORMICK:** And if ballast water were to be shocked in the fashion you've mentioned, the water would then be discharged into the project area or would it be carried back out to sea?
21811. **MR. PAUL TOPPING:** We would be talking saltwater, so it could be discharged into the project area.
21812. This area -- the experiments have been done in fact with the water in the Montreal area and in Ontario and again it was discharged. We're talking about -- while the salinity -- the salt will kill the organisms inside the ballast tank the water that then can -- would be released into the open environment would not be toxic.
21813. **MR. McCORMICK:** Thank you.
21814. And this may be stepping away from Mr. Topping's area, but does Transport Canada ever delegate vessel inspection in maritime certificate issuance responsibilities to third-parties?
21815. **MR. DONALD ROUSSEL:** Thank you. Yes we do delegate. We have the *Canada Shipping Act* authorize -- the authorization -- the recognized organizations to do work on our behalf.
21816. So we have recognized five of them at this moment Lloyd's Register of Shipping, Bureau Veritas, Det Norske Veritas DNV, Germanischer Lloyd's and American Bureau of Shipping. I mention -- did I miss one? I've got five, yeah.

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21817. So that's the one who are authorized to do work on our behalf onboard Canadian vessels.

21818. And that was part of our evidence.

21819. **MR. McCORMICK:** Thank you, Mr. Roussel.

21820. Mr. Topping, I understand that there are various ballast water -- onboard ballast water treatment technologies available, including products such as OceanSaver, Alfa Laval, BALPURE and others.

21821. Would those systems be acceptable for ships entering Canadian waters?

21822. **MR. PAUL TOPPING:** We are presently going to be evaluating the technologies. We are working with the United States and we're also working internationally.

21823. As a signatory and part of the ballast water convention there is an international framework to approve these technologies. They are reviewed by a body of experts known as the group of experts on scientific aspects of marine pollution. And they examine the proposed technology and if it -- the result of effluent, so ballast water after it's treated, if there would be any toxicological issues with the resulting ballast water. This is particularly for ballast water treatment systems that use what is called active substances, in other words chemicals to kill the organisms that would be in.

21824. So in Canada our acceptance of the technology we are going to be looking at projects, in the near future, for listing what treatment systems we have found to be effective. And we would be publicizing that, we would be working closely with the United States because they're the -- there's a lot of parts in the national program where we have shared waters.

21825. So Canadian vessels fitting such a treatment system would have to -- that frequently navigate in the United States would have to have acceptance there. I would note the United States is not yet a party to the ballast water convention so this creates a different regime at this point when we're looking at treatment systems. And we need to ensure in Canada -- that Canadian vessels would meet both.

21826. In regards to the international vessels, again as a party and for the

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particularly interested in -- for this project, these would be international vessels coming in. And again we have confidence in the IMO process that the systems that are coming in are going to be treating -- being able to treat the ballast water end result in a discharge that does not pose risks to the environment.

21827. **MR. McCORMICK:** Thank you, Mr. Topping.

21828. And just one last question on the ballast water issues. Noting that there are technologies available and they are being evaluated, not so much from a regulatory perspective but from the perspective of environmental protection, would you agree that having fitted ballast water treatment systems included in the tanker acceptance program for the Northern Gateway Project would enhance environmental protections for Canadian waters?

21829. **MR. PAUL TOPPING:** I would agree that it would enhance protection in Canadian waters by ensuring that ballast water treatment systems are in place, yes. That is what evidence that we have looked at at this point and what we're assessing right now it seems to indicate.

21830. **MR. McCORMICK:** Thank you, Mr. Topping.

21831. And I realize now I've skipped a section of my notes and I do have a couple more ballast water questions for you.

21832. **MR. PAUL TOPPING:** No problem.

21833. **MR. McCORMICK:** If a ship can't exchange ballast water within 200 nautical miles for reasons related to stability or safety of the vessel, it's my understanding that regulations permit the ship to complete the exchange at locations closer to Canadian shores. Is that correct?

21834. **MR. PAUL TOPPING:** Yes, sir, that is correct.

21835. **MR. McCORMICK:** Thank you.

21836. And would you agree that under those conditions ballast water could be discharged within 45 nautical miles of Haida Gwaii in some circumstances?

21837. **MR. PAUL TOPPING:** That would be done in very limited circumstances.

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21838. Again the requirement is when it's not safe to do so. The primary requirement is the ballast water exchange is carried out 200 nautical miles.
21839. The second requirement is if you're not able to meet that you're allowed to discharge within 50 nautical miles. And that that in turn is not allowing the discharge -- the exchange to occur there's an additional 45 nautical miles.
21840. It's important to realize that as the vessel is exchanging its ballast water it's still navigating. It doesn't occur at an instantaneous spot. It has to voyage several nautical miles in order to affect the discharge of a tank and the uptake of fresh ballast water.
21841. In establishing these limits we worked with Fisheries and Oceans on alternative exchange zones so that we have the confidence that the -- when in these rare cases that the alternative exchange zones are required then the equivalent level of protection is provided.
21842. We have similar requirements on the east coast and have identified areas that in the event that conditions do not allow the safe exchange of ballast water, bearing in mind the ballast water itself is important to the stability and trim of the vessel, and in rough water that is a critically important safety factor. And in rough seas if that were to occur in -- that it does not -- the exchange would impede the navigation then we allow for these alternative exchange zones.
21843. But again, we work with Fisheries and Oceans to identify to ensure an equivalent level of protection is provided.
21844. **MR. McCORMICK:** Thank you, Mr. Topping.
21845. Madame Clerk, could we please see displayed Exhibit E9-21-10, page 2, we look at the paragraph "B".
21846. So this is the IR from the Council of the Haisla -- Haida Nation in which they requested a map showing locations where -- currently allowed for ballast water exchange for ships in the OWA, including the vicinity of Haida Gwaii and SGaan Kinghlas Bowie Seamount Protected Area.
21847. Transport Canada responded that they didn't have a map but you could consult the ballast water control management regulations?

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21848. In relation to that, if we could please pull up Haisla Nation aid-to-cross-examination No. 1? Oh excuse me, Haisla Nation aid-to-cross-examination No. 3, please, Madame Clerk? Thank you.
21849. We decided to help out a little bit and prepared a map which we consider to be responsive to the request of the Haida Nation.
21850. This Google Earth imagery -- image was created on April 18th, 2013. We used geographic features identified in the Canadian regulations, offset at prescribed distances and merged to create continuous polygonal features and then they were converted into lines and trimmed at intersecting shorelines and international boundaries.
21851. Would you agree that this is an approximate representation of the areas where ballast may -- exchange may and may not be permitted in the relevant area, Mr. Topping?
21852. **MR. PAUL TOPPING:** Yes, I would.
21853. **MR. McCORMICK:** Now, we're aware that there's a dispute or we believe that there's a dispute between Canada and the United States about the international maritime boundary at Dickson Entrance.
21854. This map we've attempted to show the Canadian interpretation of where the boundary lies.
21855. Would you agree that the American interpretation of that boundary would place the boundary at a location further south? Roughly, in the middle of the Dickson Entrance area?
21856. **MR. PAUL TOPPING:** This is a different issue than ballast water management and, as such, the requirements that we have laid out are actually supported by the Americans as they are setting out requirements where ships may discharge their ballast water for environmental protection reasons.
21857. They are not setting out the requirements of Canada's sovereignty at this point. They're not stipulating Canada's boundaries. That's done under the *Oceans Act*.

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21858. So although the Americans would have different -- in a dispute, the Americans naturally would have a different interpretation, for the purpose of the ballast water regulations this would be a recognized area for affecting the discharge.
21859. **MR. McCORMICK:** Thank you, Mr. Topping.
21860. So am I correct in my understanding that the standards set out in the Canadian regulation will apply for the full area we see displayed here?
21861. **MR. PAUL TOPPING:** That is correct.
21862. **MR. McCORMICK:** Thank you.
21863. And has Transport Canada or Environment Canada determined the closest landfall from likely de-ballasting sites?
21864. **MR. PAUL TOPPING:** Are you, I guess, referring to where the water would end up after discharge in terms of coming ashore?
21865. Is that your -- the nature of your question, sir?
21866. **MR. McCORMICK:** That was the nature of the next question but, certainly, that's where we're headed.
21867. Has Transport Canada conducted any assessment of where the dispersal of invasive species to islands and shores down current of de-ballasting sites might be at risk if de-ballasting were to occur in areas closer to land?
21868. **MR. PAUL TOPPING:** As part of the establishment of the alternative exchange zones, Fisheries and Oceans did look at the oceanographic features.
21869. The areas that we selected were such to ensure that the waters when discharged would not return onto land but that would be dispersed into the wider ocean and that, in the exchange that was carrying out, that the species that are in -- in onboard in the ballast tank coming from an estuarine environment, an environment that has less salt in the water than the deep -- than would be in deep ocean, once released, those species themselves would not survive.

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21870. Were they to be released in port, they would be released in a very similar environment and they could introduce the -- be introduced into an environment that they are used to and have the ability to survive.
21871. So the basic approach under the ballast water exchange is -- a lot of the basic approach is that you are releasing organisms in areas where they have great difficulty to survive.
21872. So, as such, we again work with Fisheries and Oceans to ensure that, again, the equivalent level of protection was being provided and that, as part of that determination, Fisheries and Oceans had conducted those kind of studies as to where ballast water -- where there would be flows of released ballast water in the areas.
21873. And they've basically determined that these blue lines offer the equivalent level of protection as for the alternative zones as for the principle zone of 200 nautical miles.
21874. **MR. McCORMICK:** Thank you, Mr. Topping. We do appreciate your responses and the information you've provided about ballast water.
21875. We'd like to move on to a new subject and I believe it will engage the expertise of -- of Mr. Chris Doyle from Environment Canada.
21876. And, Madame Clerk, if we could please see displayed on the screen Exhibit E09-6-32, Page 14? And if we could scroll down just a bit, please, paragraph 40? Thank you.
21877. This lays out some of the areas of Environment Canada's mandate and the responsibilities of Environment Canada. We note, in the third bullet, it includes that the responsibilities aren't to provide observations, forecasts and warnings.
21878. Now, we've also heard from Northern Gateway that Environment Canada does routinely carry out verification studies of its marine weather forecast.
21879. Is that correct, Mr. Doyle?
21880. **MR. CHRIS DOYLE:** Yes, it is.

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21881. **MR. McCORMICK:** And would you agree that verification statistics are an appropriate measure of forecast accuracy?
21882. **MR. CHRIS DOYLE:** It's a -- it's a relatively simple way to produce a metric for forecast accuracy. It's easy to do.
21883. **MR. McCORMICK:** M'hm.
21884. And does Environment Canada have verification statistics for -- specific to Northern Gateway's proposed shipping routes?
21885. **MR. CHRIS DOYLE:** If I recall correctly, we have verification statistics for Hecate and most of Queen Charlotte Sound but not for Douglas Sound.
21886. **MR. McCORMICK:** And for those areas where Environment Canada does not currently possess verification statistics, has Environment Canada been approached by Northern Gateway to provide or compile those statistics?
21887. **MR. CHRIS DOYLE:** No, they have -- no, they have not approached Environment Canada.
21888. **MR. McCORMICK:** Mr. Doyle, could we just ask you to pull the microphone a little bit closer? Speak up slightly, please? Thank you.
21889. Would you agree that forecast amendment criteria are of key importance in a region of variable weather?
21890. **MR. CHRIS DOYLE:** Yes, we have amendment criteria for a reason.
21891. If a certain weather condition is forecast and the weather state actually exceeds the limits of that -- of that forecast then we -- then we amend the forecast either on the observation or if we suspect, by looking at the changes in weather patterns, that the condition may meet a threshold then we will amend the forecast as well.
21892. **MR. McCORMICK:** Thank you.

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21893. And are -- and how do forecast amendment criteria help to ensure safety in relation to projects like the Northern Gateway Project?
21894. **MR. CHRIS DOYLE:** Well, if we -- if we talk about marine forecasts- there's a number of sort of well accepted wind and sea conditions. There's a gale and there's a storm and there's a hurricane or a hurricane-force wind event. Those are the three big ones.
21895. And there are certain sea states and visibility states associated with each one of those conditions -- gale, storm, hurricane -- and so it's important, I think, for mariners to -- to understand the difference between those -- those three different criteria.
21896. **MR. McCORMICK:** And would you agree with me that the operational limits of the vessels such as VLCCs to be used as part of the project should be communicated to the weather forecast provider so that the amendment criteria are specific to the operational limits of those vessels?
21897. **MR. CHRIS DOYLE:** I am not an expert on vessel operating limits so I can't really speak to that. To my knowledge, we haven't taken feedback on the operational limits of any vessels when we're constructing weather criteria because there are -- you know, an almost infinite variety of vessels out there and we can't construct a criteria for each. So rather, we stick to the -- to the well-known historical kinds of warnings and criteria that -- that are broadly understood.
21898. **MR. McCORMICK:** So am I correct in my understanding that Environment Canada's current marine forecasts do not take into account the specific operational capacities of any of the vessels that would be travelling through the waters as part of the project. Is that correct?
21899. **MR. CHRIS DOYLE:** Well, we do have a criteria that's lower than gale. It's a small craft, and so there's a specific lower threshold wind advisory for small boaters -- small boat operators that -- that does take into account the -- the smaller vessels, the more recreational sailboats on the water, but certainly not for -- for larger vessels.
21900. **MR. McCORMICK:** Would visibility also be one of the considerations for those vessels?

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21901. **MR. CHRIS DOYLE:** Visibility is in our forecasts.
21902. **MR. McCORMICK:** You had mentioned in relation to the amendment criteria, the winds, but would visibility also be considered?
21903. **MR. CHRIS DOYLE:** Yes, if -- if there's a very big change in -- in the visibility expected over a certain area then there would be an amendment.
21904. **MR. ROB TURNER:** Excuse me, Madam Chair, may I interject a comment?
21905. Just that I want to point out that when you talking about the information that's being provided to the vessels, under the *Canada Shipping Act*, it's the master's responsibility to -- to assure the safety of the vessel and to use his or her discretion or judgment in making those decisions. So based on the meteorological information that they receive, they then use that as part of the basis of their decision-making.
21906. Thank you.
21907. **MR. McCORMICK:** Thank you, Mr. Turner.
- (A short pause/Courte pause)
21908. **MR. McCORMICK:** And Mr. Doyle, am I correct in my understanding that the forecast for the general north coast marine weather area are only amended every six hours?
21909. **MR. CHRIS DOYLE:** They're -- they're reviewed every six hours. They're amended when conditions suggest that they need to be, so that could be anytime.
21910. **MR. McCORMICK:** And just a point of clarification on that last statement, Mr. Doyle. So if you got a six-hour period and after one hour there's been a significant change in the weather, is the amendment made immediately or is it made at -- on a six-hour basis?
21911. **MR. CHRIS DOYLE:** It's -- if the meteorologist notices the significant change, then they would -- they would amend as quickly as possible.

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21912. **MR. McCORMICK:** And at this time does -- well, first of all, I just want to confirm, Environment Canada does issue commercial forecasts in some instances. Is that correct?
21913. **MR. CHRIS DOYLE:** We do issue commercial forecasts in a very limited set of circumstances.
21914. **MR. McCORMICK:** And why would industries or the recipients of those commercial forecasts require commercial forecasts?
21915. **MR. CHRIS DOYLE:** I can only speak to my experience in these matters. For example, the Lions Gate Bridge had a deck replacement project and when certain structural members of that deck were removed by the -- by the contractor, it made the bridge more susceptible to wind and there was the risk of collapse. And so they needed a quite specific forecasts of wind at the Lions Gate and in that area so they could proceed with certain aspects of their deck reconstruction. So that's one example.
21916. And so if it's -- we will provide specific forecasts if there's a very specific need, but we have a sort of a policy where we urge people seeking specialized weather information to seek out private sector weather companies to provide that for them first.
21917. **MR. McCORMICK:** Has Environment Canada made any recommendations to Northern Gateway that they acquire private forecast information?
21918. **MR. CHRIS DOYLE:** No, we haven't made any kind of recommendation like that.
21919. **MR. McCORMICK:** Would Environment Canada agree that it's important to accurately forecast potential severe weather conditions to ensure transit safety?
21920. **MR. CHRIS DOYLE:** That's part of our mission.
21921. **MR. McCORMICK:** We've seen the term "severe weather" used in the Northern Gateway evidence and I -- I can pull that up if you'd like, but what we're wondering is, as a meteorologist, how do you interpret the term "severe conditions"? I know I've used two terms there. Severe conditions is the term I'm

hoping to obtain your information on.

21922. **MR. CHRIS DOYLE:** There's kind of a couple ways we will look at it and we can look at in sort of a statistical way. If a -- if a condition is very unlikely, if a wind speed hits a certain threshold that is -- for which the return period is quite long at one year -- at one time of year, once every five years, once every 10 years, that would be considered severe because it's -- it's often something that's quite extreme and hasn't been repeated very often naturally.

21923. The other way is to look at impacts. So if a weather event has a significant negative impact on society or -- of whatever, then we would probably consider that severe as well.

21924. **MR. McCORMICK:** Perhaps it would be helpful to take a look at the evidence. Madame Clerk, could we please see Exhibit B23-6, page 74.

21925. If we look right down at the bottom in section 6.2, "The South Routes" near Caamano Sound. And Mr. Doyle, I'd direct your attention to the very last sentence there where at the last portion it reads:

"...due to these severe conditions may exceed the limits for safe transit."

21926. Do you read that use of "severe conditions" to refer to the statistical element that you've mentioned or the impacts element that you mentioned or potentially both?

21927. **MR. CHRIS DOYLE:** Well, just reading through it it seems like it's referring to impacts.

21928. **MR. McCORMICK:** And would you agree that where severe conditions may exceed the limits for safe transit, it would be dangerous in those circumstances to transit?

21929. **MR. CHRIS DOYLE:** Again, I really don't know anything about the limits to -- or restrictions to -- to individual ship movements. That's not my area.

21930. **MR. McCORMICK:** No, certainly, we wouldn't want to pull you outside your area of knowledge.

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21931. Would you agree that the sphere conditions, as you understand them, could be experienced along the proposed tanker routes?
21932. **MR. CHRIS DOYLE:** We've looked at the wind and wave climatology of the offshore waters in particular. And in our evidence you can see sort of what's -- what the distribution of wave heights are, what the frequency of storm and hurricane force winds are and they're tangible.
21933. **MR. McCORMICK:** And by tangible, I'm not sure if that's a meteorology term. That would mean, yes, they could happen?
21934. **MR. CHRIS DOYLE:** Yes.
21935. **MR. McCORMICK:** Thank you.
21936. Can visibility conditions below one nautical mile potentially be reached in the project area due to convective rain storms, more likely in the late summer or fall fog?
21937. **MR. CHRIS DOYLE:** If rain is -- these are significantly -- these are big convective rain storms. Yes, visibility obstructions usually come from fog.
21938. **MR. McCORMICK:** Has Northern Gateway discussed visibilities in the project area with Environment Canada meteorologists?
21939. **MR. CHRIS DOYLE:** Not to my knowledge.
21940. **MR. McCORMICK:** And would you agree that conditions may, at times, deteriorate in terms of visibility below three to five nautical miles in the project area?
21941. **MR. CHRIS DOYLE:** Yes, there is seasonal variation. Sea fog is quite common in the offshore area during the summer and immediately along the Pacific coastline. Further in the Sound you find sort of frequent fog occurrence in the winter.
21942. **MR. McCORMICK:** And am I correct in my understanding that visibilities below a certain limit, for instance, a half mile or a quarter mile, may go undetected by the Environment Canada monitoring systems or the meteorologist?

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21943. **MR. CHRIS DOYLE:** Yes, we depend on observations to determine visibility and where we don't have observations we can't determine the visibility precisely.
21944. **MR. McCORMICK:** And am I correct in my understanding that satellites -- well, can satellites distinguish between a fog bank and a very low level stratus?
21945. **MR. CHRIS DOYLE:** Depends how low level. There are certain algorithms used by -- in processing satellite information where you can't make a distinction between low cloud and fog, but if the fog is very close to the level of the stratus, then it would be difficult, I agree.
21946. **MR. McCORMICK:** And would that be a fairly time intensive process for a meteorologist to conduct the assessment to determine if that was the case?
21947. **MR. CHRIS DOYLE:** No, because these products are generated automatically.
21948. **MR. McCORMICK:** If the south coast or the more populated portion of the west coast experienced severe weather, do the demands for forecasting in those more populated regions result in the marine forecaster having less time to spend on the northern areas?
21949. **MR. CHRIS DOYLE:** When it comes to workload, based on my experience, the forecaster will put the greatest effort and spend the greatest amount of time on these areas where the weather is the most challenging. So if there's a storm in the north coast, the focus is on the north coast; if there's a storm on the south coast, it's on the south coast.
21950. **MR. McCORMICK:** And in those instances where you've got a large system and the storm extends along the entire coast, is there a priority given to the more populated areas?
21951. **MR. CHRIS DOYLE:** Not in my experience. The priority is given to determining whether there's going to be a threshold exceeded in the marine areas and where that's likely to occur.
21952. **MR. McCORMICK:** Thank you, Mr. Doyle.

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21953. Would you agree that the observation density in the south coast is higher or significantly higher than it is in the north coast?
21954. **MR. CHRIS DOYLE:** I guess you'd have to define "significant" for me. There are more observations in the south than there are in the north.
21955. **MR. McCORMICK:** Thank you.
21956. And how does the observation density affect the quality and reliability of the forecast information?
21957. **MR. CHRIS DOYLE:** I think in the past it had a much greater affect than it has today. There have been enormous advances in numerical weather prediction, the so-called computer models of weather. They're improving every year. They're vastly better than they were two decades ago.
21958. So I think although the observations are extremely important for verifying certain forecast elements and for catching the outliers sometimes when the models aren't behaving perfectly well, the reliability of forecasts are high and getting higher every day because the technology is improving so much.
21959. **MR. McCORMICK:** Thank you, Mr. Doyle.
21960. Now, we understand that there are no visibility stations -- I believe you might have mentioned this just recently -- in Douglas Channel. Is that your understanding as well?
21961. **MR. CHRIS DOYLE:** Yes.
21962. **MR. McCORMICK:** And, as such, small craft in the Douglas Channel would not have visibility station data specific to that area to rely upon when they're in the area?
21963. **MR. CHRIS DOYLE:** The forecast, if there're restrictions to visibility in the area, would mention that. So they would have a forecast but not an observation.
21964. **MR. McCORMICK:** Does Environment Canada operate multiple weather stations in Kitimat or just a single weather station?

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21965. **MR. CHRIS DOYLE:** There is the main weather station in Kitimat is called a reference climate station. So it's a station that's meant to gather information over a very long period of time to produce a representative climatology of the town site itself.
21966. There have been a number of different locations where Environment Canada has operated climate stations but they have different periods of operation, all of them. So at times there could be as many as two or three running at once and at times in the last century, there could be as few as one.
21967. **MR. McCORMICK:** Do we know how many are operating at the moment?
21968. **MR. CHRIS DOYLE:** I'd have to guess. There's certainly one for sure, the reference climate station. There may also be one at the Kitimat hatchery that's operating at the moment.
21969. **MR. McCORMICK:** And is it termed a climate station or do the climate station as you've described it, provide information only once every 24 hours?
21970. **MR. CHRIS DOYLE:** It collects hourly data and there have been some improvements in the way we handle that data. You can go into one of our public computer outlets, public data outlets and you actually can collect hourly data from the climate stations now. That wasn't always the case in the past.
21971. **MR. McCORMICK:** Thank you, Mr. Doyle, I really appreciate it.
21972. Now, this may be more for your colleagues involved in the actual operation of the vessel: Should shippers apply wind visibility and lightning thresholds for safe operation of tankers through all sections of the routes, including during berthing?
21973. **MR. ROB TURNER:** Robert Turner, Transport Canada.
21974. Could you just repeat that question again, please?
21975. **MR. McCORMICK:** Certainly, Mr. Turner.

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21976. Should shippers apply wind visibility and lightning thresholds for safe operation of tankers through all sections of the routes for the Project, including during berthing?

21977. **MR. ROB TURNER:** Robert Turner, Transport Canada.

21978. First of all, I would reiterate, Madam Chair, that as I indicated it is the Master's responsibility to make decisions with respect to the safety of the vessel and Masters are very well versed in monitoring and interpreting the weather, the weather forecast and warnings.

21979. In fact, the whole -- the whole -- all the seas are divided up. So to ensure that vessels do receive weather forecast and warnings through -- when they're -- sorry -- when they're out at sea through satellite communications. And off the West Coast, it's actually the NAV and MET warnings are provided by the United States because they're all divided up into different areas.

21980. And then, as a ship gets closer to the Coast, they fall into a more near-shore forecast warning system through -- through their NAV TACs, they receive warning or they can continue receiving weather information through a private weather routing -- a ship's routing service that they can contract and receive that information through their communication systems as well.

21981. So they do -- they are very much aware and attuned to making decisions based on weather. It affects everything including just their commercial interest in terms of speed and including, obviously, the safety of the vessel.

21982. So, having said that, in our TERMPOL review report which has been provided as a submission to this Panel, we have -- there is a recommendation and a finding with respect to operational limits and I would refer to Recommendation 9 and Finding 12 of the TERMPOL report that may answer the gentleman's question, Mr. McCormick's question.

21983. Do you want me to -- I could read those out if you like?

21984. **MR. McCORMICK:** No, they are available on the evidence. Thank you, Mr. Turner.

21985. This one may skirt the divide between the operational folks and Mr. Doyle.

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21986. Would transit safety be improved if the holding and anchorage areas -- all of the holding and anchorage areas -- for the Project were equipped with representative hourly automatic transmitting live weather stations for visibility and wind to be used for en-route decision-making by pilots?

21987. **MR. CHRIS DOYLE:** And I think that falls more on the side of the operators than on the forecaster.

--- (A short pause/Courte pause)

21988. **MR. ROB TURNER:** Robert Turner, Transport Canada.

21989. I understand the question was: Should there be weather sensing equipment at -- along the route at the anchorages; is that correct?

21990. **MR. McCORMICK:** Very close.

21991. Would transit safety be improved if, within the holding and anchorage areas, they were equipped with representative hourly automatic transmitting live weather stations capable of providing visibility and wind information to pilots when they're making their assessments about what to do in certain weather conditions?

21992. **MR. ROB TURNER:** I can't speak specifically about the microclimate of the area. I guess those that use the waterway would be the best capable to answer on that basis.

21993. But again, a lot of the -- a lot of the information is better from a forecast perspective so that they can know what they're getting into before they are into it so that they can make decisions perhaps not to enter the confined channel waterway if the conditions are not suitable.

21994. So they'd rather -- rather than get committed to a confined channel, they would -- they could slow down, wait for weather to improve or whatever when they're out in the open water area where they have more room to maneuver and they can operate their vessels so that's in the safest position given the conditions.

21995. Would that answer your question?

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21996. **MR. McCORMICK:** That was very helpful, Mr. Turner.
21997. I've got two more questions on the issue of weather. We should proceed or shall we take the break, Madame Chair?
21998. **THE CHAIRPERSON:** Why don't you finish those two questions and we'll take the break after that.
21999. Thank you, Mr. McCormick.
22000. **MR. McCORMICK:** Thank you, Madame Chair.
22001. If we could just pull up Transcript Volume 161, lines 7277.
22002. That would be line 7277. Perhaps we do not require the transcript.
22003. What I was going to -- oh, I believe we may have found it. It's in Volume 160, thank you, line 7277. This is questioning by myself of ---
22004. **THE CHAIRPERSON:** Mr. McCormick, is this the reference you were looking for?
22005. **MR. McCORMICK:** Oh, it is not my -- I'm looking for line 5689.
22006. **THE CHAIRPERSON:** And so can we have the volume number again, please?
22007. **MR. McCORMICK:** And I believe it is Volume 162.
22008. **THE CHAIRPERSON:** You don't sound quite so sure about that bingo number.
- (Laughter/Rires)
22009. **MR. McCORMICK:** I'm giving myself away there. It's a statement by Captain Flotre and 5689 from the same hearing.
22010. I just like to keep Ms. Niro on her toes.

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22011. **THE CHAIRPERSON:** Well, Ms. Niro is advising that she thinks it's Volume 161.
22012. **MR. McCORMICK:** Thank you very much, Ms. Niro.
22013. **THE CHAIRPERSON:** Just for your notes.
22014. **MR. McCORMICK:** I appreciate it.
22015. **THE CHAIRPERSON:** Is this what you were looking for, Mr. McCormick?
22016. **MR. McCORMICK:** That is correct, thank you very much.
22017. **THE CHAIRPERSON:** She's a mind reader, there's no doubt about it.
22018. **MR. McCORMICK:** She helps us out greatly.
22019. If I could just direct the attention of the witness panel to line 5689, this is a statement by Captain Al Flotre. And he just notes that ships are -- vessels are very well equipped with electronics and redundant navigation systems and he's referring specifically to visibility.
22020. Am I correct in my understanding that most small craft do not necessarily have the same equipment available to them for dealing with situations where there is limited visibility as would be available to larger tankers?
22021. **MR. ROB TURNER:** Robert Turner, Transport Canada.
22022. Could you define "small craft"? Maybe in tonnage or length?
22023. Like, how small do you mean? Do you mean recreational-size vessels?
22024. **MR. McCORMICK:** Recreational-size vessels, powered vessels, but certainly for more pleasure craft or small commercial vessels, whether they would possess the same quality or scope of equipment to address low visibility conditions.

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22025. **MR. ROB TURNER:** Rob Turner, Transport Canada.
22026. The main tool used in low visibility would be the radar and Transport Canada's requirements which are reflected or aligned with the international requirements under the Safety of Life at Sea Convention that the tonnage cut-off where -- where the threshold in size where a radar is mandated is 300 gross tonnes. So that's -- that's not a small vessel.
22027. Having said that, radars are -- because they're so -- of such great utility that they're carried quite widely on -- on pleasure vessels that are going for any sort of distance or voyage, including small fishing vessels and small tugs as well.
22028. **MR. McCORMICK:** Thank you, Mr. Turner. That's very helpful.
22029. For those vessels that are not necessarily equipped with radar, as you've discussed, in poor visibility conditions, do they -- do they pose a risk of collision or other interference with large tankers?
22030. **MR. ROB TURNER:** Well, as I said, again it gets back to the master's responsibility even on a small vessel and if you don't have a means of -- such as radar to assist you, then -- then you are really to go very slow and with -- you know, to adjust your speed and to navigate with extra caution given the fact that you will be in low visibility.
22031. Mariners -- masters are -- are expected to adjust their decisions accordingly based on the hazards that may be presented to them.
22032. Without a radar, if it's low visibility, the -- the vessels are meant under the -- are required under the Collision Regulations to sound fog signals -- sound signals and so they would definitely hear a vessel approaching them and just as the large vessels would be able to detect on radar and hear the sound signals of the -- of the smaller vessels as well.
22033. **MR. McCORMICK:** Thank you, Mr. Turner.
22034. I think it would be an appropriate time for our break, Madame Chair.
22035. **THE CHAIRPERSON:** Mr. McCormick, can you give us an estimate for planning purposes of where you're at with respect to your questioning?

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22036. **MR. McCORMICK:** May I defer that until after the break?

22037. **THE CHAIRPERSON:** You'll let us know 15 minute from now?

22038. **MR. McCORMICK:** Yes.

--- (Laughter/Rires)

22039. **THE CHAIRPERSON:** Thank you very much.

22040. So with that, we'll take our break and come back and 25 to 3 please.

22041. Thank you.

--- Upon recessing at 2:21 p.m./L'audience est suspendue à 14h21

--- Upon resuming at 2:35 p.m./L'audience est reprise à 14h35

22042. **THE CHAIRPERSON:** Thank you very much everyone for being
back promptly.

22043. Mr. McCormick, please continue with your questions.

GEORGE ARMSTRONG: Resumed

ANDRÉE BLAIS-STEVENSON: Resumed

CARL BROWN: Resumed

KEVIN CARRIGAN: Resumed

JOHN CASSIDY: Resumed

CAROLINE CAZA: Resumed

JOSEF CHERNIAWSKY: Resumed

JOHN CLARKE: Resumed

KIM CONWAY: Resumed

HEATHER DETTMAN: Resumed

CHRIS DOYLE: Resumed

WAYNE DUTCHAK: Resumed

MICHAEL DWYER: Resumed

MICHAEL ENGELSJORD: Resumed

CHARLES HANSEN: Resumed

GRANT HOGG: Resumed

BRUCE HOLLEBONE: Resumed

ALI KHELIFA: Resumed
ERIK KIDD: Resumed
THOMAS KING: Resumed
GWYN LINTERN: Resumed
LAURA MACLEAN: Resumed
FRANÇOIS MARIER: Resumed
PHIL MURDOCK: Resumed
GLENN ORMISTON: Resumed
DONALD ROUSSEL: Resumed
PAUL TOPPING: Resumed
ROB TURNER: Resumed
SHANE WALTERS: Resumed

--- EXAMINATION BY/INTERROGATOIRE PAR MR. McCORMICK:
(Continued/Suite)

22044. **MR. McCORMICK:** Certainly, Madame Chair.

22045. And as requested before the break, an update on our expected time. We certainly anticipate to finish the day. We believe we've gone about two -- two and a half hours now and we expect to have three to three and a half left, so in the range of our initial estimate with the potential for going over by about half an hour, 45 minutes.

22046. **THE CHAIRPERSON:** Just to add to the pressure, everybody else so far has been either under or right on time, so we'll see how you do.

--- (Laughter/Rires)

22047. **MR. McCORMICK:** We'll see.

22048. **THE CHAIRPERSON:** However, we don't want to -- we don't want to short circuit your relevant questions in any way, Mr. McCormick.

22049. **MR. McCORMICK:** Thank you, Madame Chair, we appreciate that.

22050. **MS. BIRD:** Oh, just before you go on, Mr. McCormick -- sorry about that.

22051. We would just like -- Mr. Doyle would like to just clarify part of his

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testimony from earlier.

22052. **MR. CHRIS DOYLE:** Thank you. Yeah, I think I did say that the -- the wave height data was part of our submitted evidence and it is not, but it is available from a public website which I could provide to you if you wish.

22053. **MR. McCORMICK:** No, we're okay, thank you very much, Mr. Doyle.

22054. **MR. CHRIS DOYLE:** You're welcome.

22055. **MR. McCORMICK:** I believe this may be -- some of this questioning may engage the -- the knowledge of Dr. Khelifa.

22056. If we could please see displayed on the screen Exhibit E9-39-2, page 5?

22057. I'd like to direct the witness panel's attention to the third bullet we see displayed on the screen and the second sentence of that bullet indicating:

"...hydrodynamic modelling [should be] reviewed by an expert oceanographer in coastal Hydrodynamic[s]..."

22058. So this is Environment Canada's technical review of Northern Gateway's marine spill modelling studies and related environmental consequence analysis. Can you -- or perhaps it may not be Dr. Khelifa, but could someone from the witness panel please provide an explanation of what was meant where it stated:

"...hydrodynamic modelling [should be] reviewed by an expert oceanographer in coastal Hydrodynamic[s]..."

22059. **DR. ALI KHELIFA:** You mean, you want an explanation what that means or ---

22060. **MR. McCORMICK:** Perhaps it would be more valuable to have an understanding of why that was being recommended.

22061. **DR. ALI KHELIFA:** Madame Chair, as I explained this morning, I guess, in order to conduct proper spill modelling -- oil spill modelling, there are

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- several steps. One of the crucial steps is to predict how the water is moving in that water system, and that what means hydrodynamics. It's how is moving in different places in different -- not in the overall, but in the -- in the very -- what we call high resolution, every 100 metres, for instance. And it's not only in horizontal but in vertical as well.
22062. And that's -- that's not -- when we reviewed -- when Environment Canada reviewed this part, we didn't have the -- the expertise at that time or we didn't review that part and it's -- it's more likely the expertise of oceanographers.
22063. **MR. McCORMICK:** Thank you, Dr. Khelifa. That's helpful.
22064. And to your knowledge, has that review been undertaken or been requested or begun by Northern Gateway?
22065. **DR. ALI KHELIFA:** As it's clearly mentioned here, it's a recommendation and later on, we -- and it's closely linked to the recommendation where we said we need a scientific committee here to address these -- all these kind of issues. And we hope that this scientific committee will have a good oceanographer who is familiar, not only with the area but with the -- the technical -- technical part of the -- the hydrodynamic modelling as well.
22066. **MR. McCORMICK:** Thank you.
22067. And was there a reason why this request was made only for the marine aspect of Northern Gateway's hydrodynamic modelling?
22068. **DR. ALI KHELIFA:** I guess that's what we reviewed; we reviewed the marine part.
22069. **MR. McCORMICK:** And would Environment Canada expect changes to the modelling to be made after the independent expert review has been completed?
22070. **DR. ALI KHELIFA:** I think I was very clear yesterday when I was responding to one of the question from the Panel.
22071. That the -- my hope in the future is to have an operational and state-of-the-art operational system that predict all this kind for that water system to -- to respond to spill should it occur in case of a spill or something like that.

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22072. **MR. McCORMICK:** Thank you, Dr. Khelifa.
22073. Dr. Khelifa, are you familiar with the BF Hydro model, the boundary-fitted hydrodynamic model?
22074. **DR. ALI KHELIFA:** Repeat that model, please?
22075. **MR. McCORMICK:** Certainly.
22076. The BF Hydro model. The boundary-fitted hydrodynamic model.
22077. **DR. ALI KHELIFA:** There are -- there are thousands of models out there. The name does not tell me that much but I would ---
22078. **MR. McCORMICK:** Are you familiar with the river modeling that was done by Northern Gateway and discussed as part of the Kitimat River Valley Panel?
22079. **DR. ALI KHELIFA:** As I said, we reviewed the marine part.
22080. **MR. McCORMICK:** Thank you, Dr. Khelifa.
22081. Madame Clerk, could we please see Exhibit E11-3-2, Page 15, at the bottom of the page? That would be Page 15.
22082. So this is Transport Canada's review of the TERMPOL submission from February 2012. We see -- ah, there we are. Thank you very much. To look at the bottom, in the Footnotes, please?
22083. And we see in the Footnotes that the review included consideration of Exhibit B23-15, TERMPOL section 3-15 as well as Exhibit -- as well as the marine quantitative -- Marine Shipping Quantitative Risk Analysis.
22084. And we also note that the review is prepared and approved by Transport Canada, Environment Canada, DFO and the Canadian Coast Guard.
22085. We did not, in our review of the document, identify any recommendations specifically directed at the spill modeling conducted by DNV and adopted into the TERMPOL 3-15 document.

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22086. Are we correct in our understanding that none of the recommendations in this piece of Federal Government evidence were directed at either the DNV report or the spill modeling included in TERMPOL 3-15?

22087. **MS. LAURA MACLEAN:** Hello, Mr. McCormick, it's Laura Maclean for Environment Canada.

22088. And I'll take this question, first of all, by saying that Environment Canada provided a limited amount of information to the final TERMPOL report that you have referenced here.

22089. Our contributions were primarily in the area of weather and sea state information and I would probably suggest that questions about the TERMPOL report itself might be best answered by Transport Canada.

22090. **MR. DONALD ROUSSEL:** Madam Chair, yes, in the -- in this particular TERMPOL, because we done a lot of other one, we do not scope the environmental response portion.

22091. **MR. McCORMICK:** Thank you.

22092. And perhaps returning to Ms. Maclean's comment, we're aware that Environment Canada, in Exhibit E09-39-2, has filed various critics of the marine spill modeling studies.

22093. Can you explain why those critics and recommendations were not included as part of the TERMPOL submission?

22094. **MS. LAURA MACLEAN:** What I can tell you is Environment Canada provided the exhibit that you've just referenced, the Spill Modeling Technical Review, for the benefit of the Panel to assist it with its understanding of the Project and it is a place we chose to make the specific recommendations on spill modeling.

22095. So that was the -- that was the forum where Environment Canada offered its expertise was as part of the JRP process.

22096. **MR. McCORMICK:** Would you agree that the TERMPOL submission we see displayed here on the screen is not necessarily representative

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of the full scope of Environment Canada's concerns in relation to the various aspects of the Application?

22097. **MS. LAURA MACLEAN:** So I think this goes back to the question of the Department's involvement in the TERMPOL process and we could provide more information on that if it's helpful.

22098. Environment Canada, as I've indicated however, was a technical member of the TERMPOL review committee. We provided certain expertise to that process which was taken up in certain parts of the final TERMPOL report.

22099. But other elements of the review that we conducted, including our focus on the marine spill modeling, was our comments, our recommendations and our advice were placed on the record in the context of the Joint Review Panel process, not the TERMPOL process.

22100. But, in our view, I don't think we would suggest that it's particularly important which one of those venues the comments were brought forward.

22101. I think the point is that they are -- they are in evidence and I think our recommendations in the spill modeling report are clear and we'd be happy to take additional questions on those recommendations should you have them.

22102. **MR. McCORMICK:** Did Environment Canada raise any concerns within the TERMPOL process which were not raised elsewhere in the Environment Canada evidence?

--- (A short pause/Courte pause)

22103. **MS. LAURA MACLEAN:** No, all of Environment Canada's review comments and concerns that -- whether they were brought forward in TERMPOL or not, all appear now before the JRP.

--- (A short pause/Courte pause)

22104. **MR. McCORMICK:** This may go to Transport Canada.

22105. Can you confirm that the TERMPOL review that we see on the screen here is not an independent risk analysis but rather is a review of the materials prepared by the Proponent?

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22106. Is that correct?

22107. **MR. DONALD ROUSSEL:** Yes, it's not a -- it's not an environmental review, it's an operational review on a voluntary basis made by the Proponent and, in the scope of the TERMPOL in the evidence that we present in 1.3, we scope -- we made all the reservations that were necessary because part of our submission, Madame Chair, of course include the voluntary TERMPOL that was done by the Proponent but also our entire regulatory regime that was presented and all the additional necessary step that are required.

22108. So the formal process is this -- is this Panel.

22109. **MR. McCORMICK:** Thank you, Mr. Roussel.

22110. The Haisla Nation, during questioning, raised questions and sought evidence from Northern Gateway regarding the fact that only one type of condensate was modeled for the Project.

22111. Did NRCan have any concerns about the fact that only one type of condensate was modeled?

22112. **MS. LAURA MACLEAN:** We did not review that. We -- it does not appear in our evidence on this.

22113. **MR. McCORMICK:** Does NRCan agree that condensates can vary widely in their characteristics such as specific gravity?

--- (A short pause/Courte pause)

22114. **DR. HEATHER DETTMAN:** It seems that Environment Canada has a response to your question so I will pass it to Bruce Hollebone -- Dr. Bruce Hollebone.

22115. **DR. BRUCE HOLLEBONE:** This did form -- we did ask this particular question of the Proponent during the -- one of the IR processes. I can't remember exact -- the exact one. I believe it was the first one but I could be wrong about the composition of the products to be shipped.

22116. And it, I believe, forms one of our recommendations as well that, on

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an ongoing basis, this information would be provided as part of the information we've asked for under the -- in the written evidence.

22117. **MR. McCORMICK:** Thank you, Dr. Hollebhone.

22118. And would you agree that, in order to have a representative understanding of the condensate that may be shipped, it may be necessary to evaluate more than a single condensate?

22119. **DR. BRUCE HOLLEBONE:** My understanding is that there -- from talking to industry representatives and so forth that there is a significant amount of variability or potential for variability within the condensate.

22120. This comes from reviewing the data on the industry sources, like crudemonitor.ca, and from speaking with some of the experts on that side of the house.

22121. **MR. McCORMICK:** Thank you, Dr. Hollebhone.

22122. Are you aware of any drag reducing agents or is Environment Canada aware that drag-reducing agents will be added to the diluted bitumen prior to pipelining it?

22123. **DR. BRUCE HOLLEBONE:** Environment Canada is usually not made aware of particular proprietary additives to products. We generally deal with what we get in terms of a commercial product, just as it is.

22124. So we don't usually have any special knowledge given to us about composition in advance of discovering a product. Perhaps my ---

22125. **DR. HEATHER DETTMAN:** I'm not aware of use of drag-reducing agents in these -- in dilbit or whatever.

22126. **MR. McCORMICK:** Is Environment Canada or NRCan aware that, in the December 28, 2012 submission of Northern Gateway, a drag-reducing agent injection station is included on the pipeline schematic for Bruderheim?

22127. **DR. HEATHER DETTMAN:** We did not review that part of the submission.

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22128. **MR. McCORMICK:** And are you aware of whether or not a drag-reducing agent was included in the diluted bitumen sample which was analyzed as part of the SL Ross studies and used for modelling purposes?

22129. **DR. BRUCE HOLLEBONE:** That's not indicated in either the technical data reports or the summary report included in the submission.

22130. **MR. McCORMICK:** Is it possible that the physical behaviour of spilled dilbit would be modified by the presence of a drag-reducing agent?

--- (A short pause/Courte pause)

22131. **DR. HEATHER DETTMAN:** You know, at this point, I could not comment on that.

22132. I know, like, during production they add, you know, demulsifiers and, you know, various chemicals to it along the way through the processing where they then finally get their -- the bitumen and then the diluent is added to it and so you could have those, you know, those chemicals that would be along with it.

22133. For what they add, what effect that would be, I don't know. We have not done research to know what that would be, I guess, is the way to put it.

22134. **MR. McCORMICK:** Thank you, Dr. Dettman.

22135. So you would agree with me that the chemical components of the diluted bitumen may differ if there is added a drag-reducing agent?

22136. **DR. HEATHER DETTMAN:** When they -- oh sorry. When they add a chemical like that, these would be at very low levels, like, parts per million, you know, because it would be very expensive if they're shipping a whole lot of chemical with the oil.

22137. So it would have an effect on surface tension. You know, that would be a chemical property that changes but it's not a compositional kind of change in -- well, it's at parts per million level so it's a very low-level composition change.

--- (A short pause/Courte pause)

22138. **MR. McCORMICK:** Am I correct in my understanding that if the

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- pipeline -- if the station where the drag-reducing agent would be added is shown on the pipeline schematic, that it's likely that the drag-reducing agent would be added at a later stage in the process to the initial product being prepared for shipment by Northern Gateway?
22139. **DR. HEATHER DETTMAN:** I guess if it's there, that's where they would add it.
22140. I guess these kinds of questions are getting really into the operations for Northern Gateway. So I don't have expertise in that area so I think I will stop commenting -- trying to comment. Thank you.
22141. **MR. McCORMICK:** That's fair enough. Thank you very much, Ms. -- Dr. Dettman.
22142. Madame Clerk, could we please see Exhibit E11-3-2 at page 15? We see -- I believe you'll have to scroll up a bit -- Recommendation No. 1.
22143. So this is again the TERMPOL document. We see in Recommendation No.1 a recommendation that, if there are modifications to the terminal, the Proponent should notify the relevant authority.
22144. What would be the relevant authority or authorities that should be notified in the event that there is an alteration to terminal operations?
22145. **MR. DONALD ROUSSEL:** Well, in this particular case, it will be the NEB or any other authorities that get the -- well, the legislative authorities regarding the parameter of operations.
- (A short pause/Courte pause)
22146. **MR. McCORMICK:** Am I correct in my understanding that Recommendation 1 would not require the Proponent to alert either Environment Canada or Transport Canada of these proposed changes?
22147. **MR. DONALD ROUSSEL:** No, that's not correct.
22148. Whoever's authority is involved, they should inform them. So it could be Transport, could be Environment Canada, the NEB because the operational parameters or characteristic of the Project is pretty wide and it's depend where it

- is.
22149. So the TERMPOL took the elements starting, of course, at the terminal and the interface, so ship port interface, and then made the analysis accordingly. But there is a portion on the terminal and there will be additional requirement on terminal operations within the element of the Act, the *Canada Shipping Act*, that's underway in parliament as we speak; Part 8 in particular.
22150. So it could be Transport and the link with NEB and Environment Canada; whoever's involving in it.
22151. So it's a little bit of a crystal ball there but that's the best answer we can give.
22152. **MR. McCORMICK:** We appreciate that, Mr. Roussel.
22153. So if Northern Gateway were to alter any commitments, operational parameters or characteristics of the Project specific to the marine terminal, would it be Transport Canada that should be the relevant authority which should be notified?
22154. **MR. DONALD ROUSSEL:** Madame Chair, it's depend on the specificity of the operations.
22155. For example, if what's proposed in Amendment Part 8 of the Act, we're dealing with the operational plan that should be in place for a response at the terminal itself.
22156. But we don't have specific conditions for the terminal, the construction of the terminal or any of the other thing; same thing with the ship operations.
22157. So this is the thing that we are talking about. So TC's involved, Environment could be involved also depending on the type of response that are needed.
22158. **MR. McCORMICK:** Thank you, Mr. Roussel.
22159. If we could please go to page 28?

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22160. I'll direct the attention of the witness panel to the section titled "Weather and Sea Conditions". And one or two lines and I think I believe three lines up from the bottom of that paragraph, there's a sentence indicating that:
- "The proponent is encouraged to evaluate how frequently wave heights in the area are expected to exceed weather and environmental limits being developed for vessel operations ..."*
22161. And we also see within some of the Government of Canada evidence references to the potential effects of climate change.
22162. Does Transport Canada agree that climate change could increase the potential for extreme wave heights within the CCAA and the OWA?
22163. **MR. DONALD ROUSSEL:** Sorry, Madame Chair, we're not the specialists in the climate change.
22164. **MS. ANDERSON:** Madam Chair, I think that may have been a question that would have been more properly directed at Dr. Zhang, I would believe, from Panel 1, who has since been discharged.
22165. **MR. McCORMICK:** I believe that's fair, Madame Chair. We'll continue.
22166. Madame Clerk, could we please see displayed Exhibit E7-4-2 -- and we'd look for page 4, please? Thank you.
22167. And if I could direct the attention of the witness panel to the last sentence of the second paragraph under the heading "Rationale for Assessment"? So this is DFO evidence. The document is titled: Modeling Tsunamis Associated with Recently Identified Slope Failures in Douglas Channel".
22168. What would be the impact on passing tankers if waves reaching 30 to 40 metres were generated by a slide similar to those studied in Exhibit E7-4-2?
22169. **MR. DONALD ROUSSEL:** Madame Chair, we have not studied this particular element of the effect of 60 metres wave on a 5 to 10,000 a year cycle on ship coming in every days and a half.
22170. However, in some of our just preliminary analysis of that -- and we

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- certainly don't want to be understand doing calculation there -- the chance of having the vessel right at the point of the slide, this submarine tsunami during the period that we're looking at is extremely unlikely.
22171. And you would need to do, for this type of probability, the cycle that you have every 10,000 years, the length of the voyage during the numbers of day and which area the danger zone is -- two, three kilometres one way?
22172. Because the only information we could get when we read these document was that it dissipate extremely rapidly. So the area of danger is maybe four or five kilometres each side of the tsunami area. So someone will need to calculate the probability then the ship is right in the danger zone, which is a very limited area according to the report.
22173. **MR. McCORMICK:** Is there a concern for direct impacts on the integrity of the terminal site in the event of a submarine slope failure, not only the waves themselves but other direct impacts?
22174. **MR. DONALD ROUSSEL:** When we read this report, very rapidly, we -- at the terminal it was find out that the wave would be three or four metres is our understanding. One of my folks can correct me.
22175. So a wave of that height with a tanker alongside is negligible.
22176. **DR. JOSEF CHERNIAWSKY:** Hello. This is Josef Cherniawsky. I'm on call to that report. Can they hear me?
22177. **MR. McCORMICK:** Good afternoon, Dr. Cherniawsky. Apologies if I ---
22178. **DR. JOSEF CHERNIAWSKY:** Yes ---
22179. **MR. McCORMICK:** --- mispronounced your name.
22180. **DR. JOSEF CHERNIAWSKY:** There is a little bit inaccuracy in the last statement from -- I forgot the name, I'm sorry, of the person was just saying.
22181. At the terminal location, the waves -- tsunami waves from Douglas Channel landslide, submarine landslides, tsunami waves at the terminal location would be of the order of ten centimetres not metres.

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22182. And so, in that case, there was no danger to the terminal or to Kitimat for that matter.
22183. So in that case -- so only in the region of the slide or as was said on the order of maybe 10 kilometres on each side or maybe up to 15 kilometres on each side, there is a danger zone and it lasts only for a period of a few minutes, maybe 10 minutes, no more.
22184. After that the waves subside and the current subside and the danger. It's no more dangerous than tides -- ordinary tides, the currents from the ordinary tides.
22185. But there is a period of very intense tsunami wave activity. So it's waves of the order of 20 metres, 30 metres and currents of 20 to 30 knots so -- but this period is very short. And it's only in the region of the -- in the immediate region of submarine landslide itself.
22186. That's all I have to add at this moment.
22187. **MR. McCORMICK:** Thank you. That is our understanding as well.
22188. I believe the response may have been premised on a misunderstanding of the question. The other question didn't seek to confirm the potential for damage to the terminal resulting from waves but whether there are slope stability concerns associated with submarine slope failure that could potentially impact the terminal, separate and apart from wave action.
22189. **MR. DONALD ROUSSEL:** We don't have this information.
22190. **DR. GWYN LINTERN:** Gwyn Lintern from NRCan.
22191. I reviewed the slope failures in Kitimat Arm that have taken place. So the failures in Kitimat Arm are known and are being taken seriously by the Proponent. They've conducted further reports on them. So far the reports are qualitative in nature.
22192. **MR. McCORMICK:** And the failures you refer to are those rigid body submarine failures within Kitimat Arm?

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22193. **DR. GWYN LINTERN:** They're failures in the glacial marine sediment, submarine failures in a soft sediment.
22194. **MR. McCORMICK:** Has NRCan definitively ruled out the possibility of that type of failure affecting the marine terminal?
22195. **DR. GWYN LINTERN:** NRCan is not a regulator on this. We haven't done any of our own investigations, we've just reviewed the literature that exists and the investigation is done by Northern Gateway.
22196. **MR. McCORMICK:** And in your opinion, has sufficient geotechnical work been completed in the vicinity of the proposed marine terminal?
22197. **DR. GWYN LINTERN:** The reports to date outline a number of steps that need to be taken during the detailed engineering design. And those include a number of steps on better understanding the slides, as well as what would need to be known for doing a foundation design for the geotechnical engineering.
22198. So those steps, in my opinion, seem to be good -- appropriate.
22199. **MR. McCORMICK:** Appropriate but not yet complete?
22200. **DR. GWYN LINTERN:** Not complete yet. Normally this would be done as part of the geotechnical design or the -- at the design stage. This is a building requirement.
22201. **MR. McCORMICK:** Thank you.
22202. Now, it's my understanding that a viscous submarine landslide has also occurred in the area; is that correct?
22203. **DR. GWYN LINTERN:** I think what I'm talking about are viscous slides.
22204. **MR. McCORMICK:** And then those occurred as recently as 1974 and 1975; is that correct?
22205. **DR. GWYN LINTERN:** That's correct, yeah.

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22206. **MR. McCORMICK:** Based on the information that has been provided by the Proponent to date, is it possible to determine with accuracy and reliability the probability or risk of a submarine slide occurring within the vicinity of the proposed terminal?

22207. **DR. GWYN LINTERN:** Based on what's provided to date it's not possible to calculate the risk. But what has been provided is a qualitative analysis of the risk.

--- (A short pause/Courte pause)

22208. **MR. McCORMICK:** Thank you, Dr. Lintern.

22209. Madame Clerk, could we please see displayed Exhibit E9-6-30, page 25? If we could scroll down to comment 108. This is Volume 6, Part 2 of Natural Resources Canada written evidence.

22210. When assessing the terrain hazard and risk for the project, did NRCan limit itself to the data and analysis provided in response to this comment or were other aspects of the application considered?

22211. **MR. JOHN CLARKE:** It's John Clarke for Natural Resources Canada.

22212. I think this is a question best directed at Dr. Andrée Blais-Stevens, she's on the line.

22213. Andrée, are you there?

22214. **DR. ANDRÉE BLAIS-STEVENS:** Yes.

22215. **MR. JOHN CLARKE:** Yes.

22216. **DR. ANDRÉE BLAIS-STEVENS:** Yes, I am.

22217. Can you repeat the question, please?

22218. **MR. McCORMICK:** Certainly, Dr. Blais-Stevens.

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22219. We see here in comment 108 a request for additional information.
22220. **DR. ANDRÉE BLAIS-STEVENSON:** Yes.
22221. **MR. McCORMICK:** When NRCan was conducting an assessment of terrain hazard and risk for the project, has NRCan or will NRCan limit itself to that data and analysis or has it also considered other aspects of the application?
22222. **DR. ANDRÉE BLAIS-STEVENSON:** Well, I have worked in that area before so I had an idea of what the terrain looked like. So -- but as far as reviewing, I based myself on the review provided by -- or the environmental assessment provided by Enbridge.
22223. **MR. McCORMICK:** And as part of that review, has the federal government considered the revised SQRA and its three attachments filed in February 2013 as Exhibit B192-2 -- or 196-2?
22224. **DR. ANDRÉE BLAIS-STEVENSON:** Yes, I have -- I have reread it, yes, sir. I have looked at it, yes.
22225. **MR. McCORMICK:** And would you agree that Northern Gateway has altered its approach to a failure likelihood assessment in Exhibit B196-2 from the earlier versions of the SQRA?
22226. **DR. ANDRÉE BLAIS-STEVENSON:** Well, the -- can you repeat that question?
22227. **MR. McCORMICK:** Certainly.
22228. Upon our review of the document we believe that there's been a significant modification in how Northern Gateway has assessed the failure likelihood.
22229. Would you agree that Northern Gateway has altered its approach to failure likelihood assessment in Exhibit B196-2 from the earlier versions of the SQRA?
22230. **DR. ANDRÉE BLAIS-STEVENSON:** The way I saw their SQRA the second time around was that they updated it because of their revised route to Route V instead of U.

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22231. But as far as the approach that they took, if that's what you're asking, I think they took the same approach.
22232. **MR. McCORMICK:** Madame Clerk, could we please take a brief look at Exhibit B196 -- B196-2, page 60?
22233. So Figure 1 shows a comparison of failure frequency approaches. The original SQRA used a maximum failure frequency approach which we see in red, whereas the revised SQRA shows an average failure frequency approach displayed in green.
22234. Would you agree that the approach that has been applied in the revised SQRA, the newer version, is less conservative than the approach that was applied in previous versions?
22235. **DR. ANDRÉE BLAIS-STEVENS:** I would have to review that table or that figure. That is something that I oversaw. I didn't -- I'd have to make sure that I -- before I answer your question that I would -- I'd have to review it.
22236. **MR. McCORMICK:** Thank you, Ms. Blais-Stevenson or Dr. Blais-Stevenson.
22237. Are you in a position to comment ---
22238. **DR. ANDRÉE BLAIS-STEVENS:** Blais-Stevens.
22239. **MR. McCORMICK:** Blais-Stevens. Thank you.
22240. Are you in a position to comment on whether the revised SQRA can be meaningfully compared with the previous versions of the SQRA in terms of design features and risk assessment?
22241. **DR. ANDRÉE BLAIS-STEVENS:** Well in terms of the way they treated geohazards is what I can comment on.
22242. **MR. McCORMICK:** Could we please look at page 85 of this document, Madame Clerk.
22243. So this is Attachment 3 to the revised SQRA, the report on

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Quantitative Geohazard Assessment Route Revision V prepared by AMEC.
Please note the second and third sentences in paragraph four in the sentence
beginning: "In the previous version of this report".

22244. Would you recall that the calculated frequency of loss of containment
for lateral spreading presented as unmitigated -- was presented as an unmitigated
value in the original SQRA Ms. Blais-Stevens -- or Dr. Blais-Stevens?
22245. **DR. ANDRÉE BLAIS-STEVENS:** Again this is something I'd have
to go back and check.
22246. **THE CHAIRPERSON:** Mr. McCormick, can you show us where
you are on the page please?
22247. **MR. McCORMICK:** It was paragraph 4 in the mix of the middle
there, I think it's the second sentence.
22248. **THE CHAIRPERSON:** Thank you.
22249. **MR. McCORMICK:** But I'm understanding from Dr. Blais-Stevens
-- Dr. Blais-Stevens you wouldn't be in a position to -- to address the substantive
aspects of this report. Is that correct?
22250. **DR. ANDRÉE BLAIS-STEVENS:** I think I can address some things
but I'd have to digest this last question that you -- you posed and take some time
for that.
22251. **MR. McCORMICK:** Okay. Well perhaps we can move along and
perhaps we could ask if you could give some consideration to that over the break
this evening and we may pose the question again tomorrow morning as we return.
22252. But prior to that, in your opinion -- or is it your opinion that the glacial
marine clay in areas of the lower Kitimat Valley cannot be completely avoided?
22253. **DR. ANDRÉE BLAIS-STEVENS:** I happen to have the surficial
geology map here of the Kitimat Valley that was published by John Clague in the
eighties I believe. And there are areas that do not have glacial marine clay.
22254. But in general the -- during the last -- during the de-glaciation period
there was inundation of the marine waters up to 200 metres in elevation. So

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- chances are at some point there were glacial marine clay deposited or sediments deposited because of glaciers hitting the seawater. It might not have been clays, it could have been courser sediments than clays.
22255. **MR. McCORMICK:** Thank you, Dr. Blais-Stevens.
22256. Madame Clerk, could we please see displayed Exhibit E9-21-12, page 105?
22257. Madame Clerk (sic), is the intention of the Joint Review Panel to sit until 3:30 or four o'clock today?
22258. **THE CHAIRPERSON:** We announced this morning we'll be sitting till four today.
22259. **MR. McCORMICK:** Okay. Thank you.
22260. If I could direct the attention -- so this is the federal government response to Haisla Nation Information Request Number 1. And we see here the answer to 1.59 a to f, refers to voluntary measures. And there's also the recent federal government's announcement of a world-class tanker safety system.
22261. In relation to voluntary measures will any federal government department be in a position to put into place additional regulations for the enforcement of the Proponent's terminal regulations?
22262. **MR. DONALD ROUSSEL:** Madame Chair, we certainly don't want to do regulation on the stand there. So there is a formal review that is underway regarding the tanker safety, and it's fairly broader than just tanker safety itself south of 60.
22263. So there's a panel who are doing some of those reviews as we speak. There's amendments to the *Shipping Act*, Part 8 that is in Parliament as we speak with regulatory making power for HNS which is oil handling facilities.
22264. So in the future there is a need to make regulations regarding specificities of oil handling facilities, the Governor-in-Council will certainly be the one who will make the regulations.
22265. Which -- what I said, HNS. I'm sorry, OHF which is oil handling

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facilities not hazardous and noxious substance, sorry for that.

22266. **MR. McCORMICK:** And should Kitimat be designated as a public port which federal department would be responsible for the administration of that public port?

22267. **MR. DONALD ROUSSEL:** Is Mr. Marier on the phone?

22268. **MR. FRANÇOIS MARIER:** Yes I am here.

22269. **MR. DONALD ROUSSEL:** Yeah so he -- Mr. Marier can handle that question.

22270. **MR. FRANÇOIS MARIER:** Well, that would be Transport Canada because it's done pursuant to the *Canada Marine Act* which the Minister of Transport is responsible for.

22271. **MR. McCORMICK:** Thank you, Mr. Marier.

22272. Madame Clerk, could we please see Exhibit -- oh, this Exhibit, but page 66.

22273. I direct the attention of the witness panel to the response to Haisla Nation IR 1.7g. The question asked by the Haisla Nation was:

“If Kitimat were a designated port, would there be more resources located in Kitimat?”

22274. And we see in the response that:

“Designated ports carry requirements to have minimum levels of equipment and a contract with a certified response organization.”

22275. Now, as noted by Mr. Marier the -- the proposed public port designation is under the *Canada Marine Act*.

22276. Would a designation of Kitimat, as a public port, under the *Canada Marine Act*, have the effect of requiring the proposed Northern Gateway marine terminal to have equipment in Kitimat and a contract with a certified response

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organization?

22277. **MR. DONALD ROUSSEL:** François, do you want to answer this one or...
22278. **MR. FRANÇOIS MARIER:** Well, I think there might be some confusion here.
22279. **MR. DONALD ROUSSEL:** Yes.
22280. **MR. FRANÇOIS MARIER:** I think the paragraph that you're referring to is -- is pursuant to the *Canada Shipping Act* which deals with oil handling facilities.
22281. And you had spoken earlier about public port designations which is under the *Canada Marine Act* which is for vessel traffic control. So they are two very different and distinct things.
22282. **MR. McCORMICK:** So am I correct in my understanding that the designation of Kitimat as a public port under the *Canada Marine Act* does not change the requirements relating to response organization; is that correct?
22283. **MR. FRANÇOIS MARIER:** Yes, that is correct.
22284. **MR. McCORMICK:** And am I also correct in my understanding that the designation of Kitimat as a public port under the *Canada Marine Act* would not necessarily require the designated port to have minimum levels of equipment or a contract with a certified response organization?
22285. **MS. ANDERSON:** Madam Chair, before the witness answers, I wonder if it might be of assistance to the witnesses if we could just scroll down a little bit because I think some of these matters are right in the following paragraph. It might be helpful for them to see that.
22286. **THE CHAIRPERSON:** Do the witnesses have anything further to add to the question of Mr. McCormick in addition to what's in written evidence?
22287. **MR. FRANÇOIS MARIER:** This is François Marier at Transport Canada.

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22288. I would simply add to repeat what I had said earlier, that these are two very different and distinct things. And what was announced on March 18th has to do with the *Canada Marine Act* public port designation which is for vessel traffic control regulations under that Act and has nothing to do with what is up on the screen currently.

22289. **MR. DONALD ROUSSEL:** If I may add, Madame Chair, is that we're mixing two things, so if there is a decision to have an oil handling facility within the Port of Kitimat, then for the purpose of response of the port become designated, then it's triggered the element regarding the actual equipment. But this will be part of the analysis of the Proponent when it's come to a governmental response.

22290. **MR. McCORMICK:** Thank you, gentlemen, that's very helpful.

22291. Madame Clerk, could we please take a look at Haisla Nation aid to cross-examination number 1?

22292. This is the local newspaper, the Northern Connector. It's dated April 5th, 2013, and we see at the bottom of the page a front page story headline "Port Announcement Causing Confusion".

22293. Has the witness panel had the opportunity to review this document?

22294. **MR. FRANÇOIS MARIER:** It's François Marier here, Transport Canada.

22295. Yes, I've had the opportunity to look at it.

22296. **MR. McCORMICK:** Thank you, Mr. Marier.

22297. So if we take a look at the second -- the highlighting in the second column. It indicates that:

"Kitimat mayor Joanne Monaghan is reported to have raised concerns about the lack of consultation with the District of Kitimat regarding the proposed changes." (As read)

22298. Has the federal government conducted consultations with the local communities about the proposed designation of a public port in Kitimat or was the

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- public announcement made prior to engaging with those communities?
22299. **MR. FRANÇOIS MARIER:** The -- the announcement was made and there was no prior consultation with the District of Kitimat.
22300. Going forward however, since this is a regulatory process, those parties that are impacted by the decision will be consulted through the usual regulatory process.
22301. **MR. McCORMICK:** Thank you, Mr. Marier.
22302. And noting the highlighted portion in the bottom right-hand corner of the story, it refers to Rio Tinto, Alcan's Communication and External Relations Manager reporting that Rio Tinto Alcan is also seeking clarification on how they may be affected.
22303. Am I correct in my understanding that the federal government has not conducted consultations with local industries that may be affected by the proposed designation of a port -- public port in Kitimat?
22304. **MR. FRANÇOIS MARIER:** You would be correct. Yes, there was no prior consultation with Rio Tinto or local industry either.
22305. However since the announcement, there have been some initial discussions between the department and both the District of Kitimat and Rio Tinto Alcan.
22306. **MR. McCORMICK:** Thank you, Mr. Marier.
22307. And are you aware of whether or not there has been any consultation with the Haisla Nation in relation to the decision to designate Kitimat as a public port?
22308. **MR. FRANÇOIS MARIER:** No, there was no prior consultation with the Haisla Nation. But again, going forward, since it is a regulatory process, if the Haisla Nation is a party that would be impacted by the decision, they would be part of the consultations.
22309. **MR. McCORMICK:** Thank you.

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22310. Madame Clerk, could we please see Exhibit E9-21-12, page 89?
Thank you.

22311. I direct the attention of the witness panel to the response to 1.48d, and the -- I believe it's the second sentence, it indicates:

“...it is the Proponent’s responsibility to provide appropriate information and analysis relating to the properties, fate and effects of the hydrocarbons to be shipped.”

22312. Now, elsewhere in the evidence, Northern Gateway has stated that in the event the project is approved, it agrees to participate in a collaborative government/industry/academia research effort and I believe Dr. Hollebhone has discussed that as well into the environmental behaviour and fate models for diluted bitumen.

22313. In the opinion of Environment Canada, who should be funding those collaborative government industry research projects?

22314. **DR. CAROLINE CAZA:** Caroline Caza for Environment Canada.

22315. I believe in our recommendation which was really focussed more on the -- the technical and scientific rationale for this and -- and the potential mechanism, we didn't address the issue of funding.

22316. Clearly, there would be further discussions to be had on this. I think the one area in which we were clear though is that we would see the Proponent providing the information, including samples and so I could -- we could assume that costs associated with that would be borne by the Proponent. But beyond that, I don't think we've ventured into considerations of funding at this point in time.

22317. **MR. McCORMICK:** Thank you, Dr. Caza.

22318. Madame Clerk, could we please go to Exhibit E9-6-32, page 21.

22319. If I could direct the attention of the witness panel to the -- paragraph 65, and the first sentence where it indicates that:

“...important uncertainties with respect to product behaviours in the marine environment...”

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22320. And we've discussed in some length some of these aspects, but we'd like to confirm, would it be fair to say that these concerns apply not only to spill response planning but also to risk assessment?
22321. **DR. CAROLINE CAZA:** Caroline Caza for Environment Canada.
22322. I think the answer to that would be yes, as indicated in the text.
22323. **MR. McCORMICK:** Thank you, Dr. Caza.
22324. Does Environment Canada now have enough information from the Applicant to make -- reach definitive conclusions regarding the risk to the marine environment should the product be spilled?
- (A short pause/Courte pause)
22325. **DR. CAROLINE CAZA:** Could you repeat the question please?
22326. **MR. McCORMICK:** Certainly. Does Environment Canada now have enough information from the Applicant to reach definitive conclusions regarding the risk to the marine environment, in the event that the product is spilled?
22327. **DR. CAROLINE CAZA:** I think Environment Canada would have a role, that's a rather broad statement and the risk -- the sort of -- the phrase risk to the environment encompasses a lot of different elements with respect to the areas where we have technical and scientific expertise.
22328. I think that we've answered that question over the course of the last few days where we've indicated that there is still information outstanding relevant to our areas of expertise.
22329. But the broader -- I mean that question has a-- is quite broad and other departments would have other perspectives on -- and other things to contribute to answering that question.
22330. **MR. McCORMICK:** Thank you, Dr. Caza.
22331. Madame Clerk, could we please see Exhibit E9-21-12, page 95?

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22332. I direct the witness panel to the response to 1.52a. It refers to preliminary comments related to spill response to Transport Canada as part of the TERMPOL review process.
22333. Were those preliminary comments incorporated into the TERMPOL review process document?
22334. **MS. ANDERSON:** Madam Chair, it might assist the witnesses if they could see the question as well as the response.
22335. **MS. LAURA MACLEAN:** So we touch -- it's Laura Maclean for Environment.
22336. We touched on some of the involvement that Environment Canada had in TERMPOL previously but I'll try and expand on that here to assist you.
22337. The Proponent provided information as part of its TERMPOL application and I think specifically section 3.15, which addresses risks of accidents and potential environmental consequences.
22338. So the Proponent, at that time, filed a number of technical reports. A number of those reports had information that was germane to Environment's mandate, including spill modelling. I would add that there were also reports that touched on environmental consequences, including considerations that had us involve our Canadian Wildlife Service colleagues who were here on panel 1.
22339. So we began, at that time, to review the material provided by the Proponent in the context of TERMPOL. However, through our subsequent participating in the TERMPOL process, working with Transport Canada as the lead for that process, we came to a better understanding of the scope of the TERMPOL exercise.
22340. And it became clear to us through discussions that commentary and concerns that we had with respect to whether it was the spill modelling, fate and behaviour or marine birds issues would be appropriately directed to the Joint Review Panel process. And so that is where you see Environment Canada's concerns reflected in our evidence.
22341. So for that reason, it's my understanding that you don't see

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- commentary on spill modelling in the TERMPOL report.
22342. But if my colleagues at Transport Canada had anything additional to add, I would provide them with that opportunity.
22343. **MR. McCORMICK:** I see Mr. Roussel indicating that there's no further comments from Transport Canada.
22344. Madame Clerk, could we please see Transcript Volume 168, line 18069?
22345. And this is from questioning on April 23rd, 2013. I was in a discussion with Dr. Khelifa and we were asking about the determination of an appropriate volume to reflect the 95th percentile for a very large crude carrier. Dr. Khelifa suggested it might be something that fits appropriately within the area of knowledge of Transport Canada.
22346. And I was wondering if Transport Canada would be able to provide an estimate of what a spill -- model of a spill at the 95th percentile volume would be for a VLCC with a cargo capacity of 2.2 million barrels?
- (A short pause/Courte pause)
22347. **MR. DONALD ROUSSEL:** So I'm informed that the information is in the DNV report.
22348. **MR. McCORMICK:** Thank you, Mr. Roussel.
22349. Madame Clerk, could we please go to Exhibit B83-2, page 15?
22350. I'll direct the attention of the witness panel to Answer 25. Northern Gateway agrees to provide data about physical and chemical properties of subject oils into an accessible database format. Northern Gateway suggests applying a standardized industry procedure to meet this requirement.
22351. Could Environment Canada explain what a standardized industry procedure for compiling physical and chemical properties of oils might look like?
22352. **DR. BRUCE HOLLEBONE:** Sorry, it took me awhile to find that in the text. Bruce Hollebhone for Environment Canada.

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22353. I'm not exactly sure myself what they're referring to here. However, there are standards, as they note with regard to -- well, standards of practice in both the crudemonitor.ca site and our own database site. And this is actually part of our recommendation in the evidence as well but we will advise them on how to do this.
22354. I will note that these things are under development as they go in -- as we go on with time and that there is no standard under regulation or even best practice one standard for this at this time. So we had thought that this would form part of that advice component that would come out of the scientific community that we have recommended in our evidence, how this exact format would work.
22355. What we're looking for ultimately, is compatibility with the major consumers of the information which would largely be spill modellers and researchers.
22356. **MR. McCORMICK:** We've touched briefly on the use of dispersants in the absence of a strong regulatory framework for determining when and how dispersants may be used.
22357. What types of environmental and effects monitoring would Environment Canada require for dispersant applications in the project area?
22358. **DR. BRUCE HOLLEBONE:** I'm sorry; I think we're a little unclear on what your meaning is. Would you mind repeating the question please?
22359. **MR. McCORMICK:** Certainly. Assuming that at some point Environment Canada were to approve the use of dispersants and those dispersants were then used as part of the response, what types of environmental and effects monitoring would Environment Canada require as -- in relation to the application for the use of dispersants?
22360. **MR. GRANT HOGG:** Hi, Grant Hogg, Environment Canada.
22361. I don't think it's yet -- it's not yet been determined which department would actually have the approval authority for allowing the use of dispersants at the time of a spill so that's -- I just want to make sure that that's clear.
22362. Certainly I would presume that the effects monitoring would be related

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to the environmental end points that were established during the response. So -- and as I had described earlier on -- I think it might have been on Monday -- when something like a shoreline cleanup assessment is done, those environmental end points are often established through collaborative discussions with scientific experts and people who have an interest in the environment returning to, hopefully, baseline stages.

22363. So the environmental effects monitoring would likely be a line to the environmental end points that were established. So I think it would depend on the type of spill, it would depend on the type of environment that was impacted, and it would depend on the type of environmental end points that were established.

22364. And then depending upon what those monitoring subjects were, it may be determined at that time who's best placed to lead the overall monitoring of that area that was affected.

22365. **MR. McCORMICK:** Thank you, Mr. Hogg.

22366. Am I correct in my understanding that if in situ burning is used as a response method, it will -- it may generate tar balls; is that correct?

22367. **DR. BRUCE HOLLEBONE:** Whenever you use burning as a technique, it does leave a residue; not all of the oil is consumed. And one of the considerations, if you decide to use, and if it is judged in the net environment benefit to use burning as a possible mitigation technique, is to the consideration of those burned residues and what do you do about them. So this is one of the considerations we would make.

22368. And there would be -- in the Gulf for instance, they had equipment on standby to help clean up some of those residues. Sometimes all of the material may burn, sometimes it may not and you have to be prepared for that eventuality.

22369. So in the hypothetical that this might be used in this -- for a spill of products under consideration, that would be part of the planning in advance to concern ourselves with.

22370. **MR. McCORMICK:** And would you be able to provide information on the effectiveness or success rates in terms of how much of the total product residue that was there was actually recovered?

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22371. **DR. BRUCE HOLLEBONE:** I don't have that information myself, no.
22372. **MR. McCORMICK:** And am I correct in my understanding that the tar balls may have a higher likelihood to sink than the product prior to being burned?
22373. **DR. BRUCE HOLLEBONE:** We have done some studies on Orimulsion burning, which is a similar kind of product. And I would refer you, for the technical details there, to the results of that study. I don't have them at hand right now but I would suggest that that would be a place to look for that information.
22374. **MR. McCORMICK:** Could we go to page 19, please, Madame Clerk?
22375. We note here that the Environment Canada -- I'm looking at Question 33 -- has recommended that Northern Gateway follow a risk assessment process similar to the ongoing Aleutian Islands or Cook Island -- Cook Inlet risk assessments.
22376. And Northern Gateway responds that their effort is similar to the Aleutian Islands because they retained one of the same consultants, DNV, that provided some analysis to Phase A of the Aleutian Islands risk assessment.
22377. Does Environment Canada consider that a fair characterization that Northern Gateway's efforts are similar given that the Aleutian Islands and Cook Inlet risk assessments have been conducted with stakeholder involvement?
22378. **DR. ALI KHELIFA:** Hi, this is Ali Khelifa, Environment Canada.
22379. Could you repeat the question, please?
22380. **MR. McCORMICK:** Certainly. We see that Northern Gateway has drawn some similarity between the Aleutian Islands risk assessment and the Cook Island -- Cook Inlet risk assessment and their own risk assessment.
22381. And we're wondering whether Environment Canada considers it appropriate to characterize Northern Gateway's risk assessment process as similar to the Aleutian Islands and Cook Inlet risk assessments given that the Northern

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- Gateway process did not actively involve stakeholders in the same fashion.
22382. **DR. ALI KHELIFA:** Perhaps what I can -- what we can comment on is the technical aspect, not the stakeholder aspect.
22383. From a technical aspect, I think the recommendation is very clear. And we made the reference to Aleutian Island risk assessment study. At that time when we made the recommendation the Cook Inlet was not advanced, but we mostly -- and we did mention that.
22384. **MR. McCORMICK:** Thank you, Dr. Khelifa.
22385. Madame Chair, I note the time, it's now 4 o'clock, shall we convene again tomorrow?
22386. **THE CHAIRPERSON:** Yes, let's do that.
22387. Mr. McCormick, can you give us another update on where you're at with respect to your questions for planning purposes.
22388. **MR. McCORMICK:** I'm pleased to report we've moved much more quickly than we'd initially anticipated. To be safe, I would estimate in the range of two hours or less and I should be able to provide a more accurate assessment in the morning when we've reviewed.
22389. **THE CHAIRPERSON:** Thank you, Mr. McCormick, it's just so the next party can have an idea of when they'll be up for questions.
22390. Thank you very much, everybody, we'll stop for today.
22391. And I want to thank the -- I know some of the witnesses who are present in Prince Rupert are probably still on different time zones with their bodies and I know other witnesses participating remotely are definitely in different time zones. Thank you very much for your perseverance in being here despite the time zone differences and we'll begin again tomorrow morning at 8:00.
22392. Good evening.

--- Upon adjourning at 4:02 p.m./L'audience est ajournée à 16h02