

Commission of Inquiry into the Decline of  
Sockeye Salmon in the Fraser River



Commission d'enquête sur le déclin des  
populations de saumon rouge du fleuve Fraser

## Public Hearings

## Audience publique

**Commissioner**

L'Honorable juge /  
The Honourable Justice  
Bruce Cohen

**Commissaire**

**Held at:**

Room 801  
Federal Courthouse  
701 West Georgia Street  
Vancouver, B.C.

Wednesday, August 17, 2011

**Tenue à :**

Salle 801  
Cour fédérale  
701, rue West Georgia  
Vancouver (C.-B.)

le mercredi 17 août 2011

## APPEARANCES / COMPARUTIONS

Wendy Baker, Q.C. Maia Tsurumi	Associate Commission Counsel Junior Commission Counsel
Tim Timberg Geneva Grande-McNeill	Government of Canada ("CAN")
Heidi Hughes	Province of British Columbia ("BCPROV")
No appearance	Pacific Salmon Commission ("PSC")
No appearance	B.C. Public Service Alliance of Canada Union of Environment Workers B.C. ("BCPSAC")
No appearance	Rio Tinto Alcan Inc. ("RTAI")
Alan Blair Shane Hopkins-Utter	B.C. Salmon Farmers Association ("BCSFA")
No appearance	Seafood Producers Association of B.C. ("SPABC")
No appearance	Aquaculture Coalition: Alexandra Morton; Raincoast Research Society; Pacific Coast Wild Salmon Society ("AQUA")
Tim Leadem, Q.C.	Conservation Coalition: Coastal Alliance for Aquaculture Reform Fraser Riverkeeper Society; Georgia Strait Alliance; Raincoast Conservation Foundation; Watershed Watch Salmon Society; Mr. Otto Langer; David Suzuki Foundation ("CONSERV")
Don Rosenbloom	Area D Salmon Gillnet Association; Area B Harvest Committee (Seine) ("GILLFSC")

**APPEARANCES / COMPARUTIONS, cont'd.**

No appearance	Southern Area E Gillnetters Assn. B.C. Fisheries Survival Coalition ("SGAHC")
No appearance	West Coast Trollers Area G Association; United Fishermen and Allied Workers' Union ("TWCTUFA")
No appearance	B.C. Wildlife Federation; B.C. Federation of Drift Fishers ("WFFDF")
No appearance	Maa-nulth Treaty Society; Tsawwassen First Nation; Musqueam First Nation ("MTM")
No appearance	Western Central Coast Salish First Nations: Cowichan Tribes and Chemainus First Nation Hwlitsum First Nation and Penelakut Tribe Te'mexw Treaty Association ("WCCSFN")
Brenda Gaertner Crystal Reeves	First Nations Coalition: First Nations Fisheries Council; Aboriginal Caucus of the Fraser River; Aboriginal Fisheries Secretariat; Fraser Valley Aboriginal Fisheries Society; Northern Shuswap Tribal Council; Chehalis Indian Band; Secwepemc Fisheries Commission of the Shuswap Nation Tribal Council; Upper Fraser Fisheries Conservation Alliance; Other Douglas Treaty First Nations who applied together (the Snuneymuxw, Tsartlip and Tsawout); Adams Lake Indian Band; Carrier Sekani Tribal Council; Council of Haida Nation ("FNC")
No appearance	Métis Nation British Columbia ("MNBC")

**APPEARANCES / COMPARUTIONS, cont'd.**

No appearance	Sto:lo Tribal Council Cheam Indian Band ("STCCIB")
No appearance	Laich-kwil-tach Treaty Society Chief Harold Sewid, Aboriginal Aquaculture Association ("LJHAH")
No appearance	Musgamagw Tsawataineuk Tribal Council ("MTTC")
No appearance	Heiltsuk Tribal Council ("HTC")

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1 Vancouver, B.C. /Vancouver  
2 (C.-B.)  
3 August 17, 2011/le 17 août  
4 2011  
5

6 THE REGISTRAR: The hearing is now resumed.

7 MS. BAKER: Thank you, Mr. Commissioner, welcome back  
8 from the break. And I have a few housekeeping  
9 matters to take care of left over from the  
10 previous hearing dates, before we started today  
11 with Jack Rensel, who is here from the U.S. So if  
12 I can just run through these fairly quickly.

13 We have a few matters that are outstanding,  
14 so we added the follow-up from our days with Greg  
15 Savard and Carol Cross, some outstanding follow-up  
16 that was asked, that you asked the witnesses to  
17 do. That came by letter from Canada on August 2,  
18 2011, and attached to that letter was a document,  
19 Service Schedule. So I'd like to have those  
20 marked as an exhibit, the letter as the numbered  
21 exhibit, and then the schedule attached as that  
22 number A.

23 THE REGISTRAR: That will be marked as Exhibit number  
24 1361, and 1361A.  
25

26 EXHIBIT 1361: Letter to Commission from DFO  
27 re Request for Information on Habitat  
28 Enhancement and Restoration, August 2, 2011  
29

30 EXHIBIT 1361A: Attachment to Exhibit 1361,  
31 DFO Financial Information re Habitat  
32 Enhancement and Restoration, July 26, 2011  
33

34 MS. BAKER: Thank you. We also had, of course, Skip  
35 McKinnell was here as a witness in July and his  
36 c.v. was marked, but his c.v. was not redacted and  
37 his personal information was still on that  
38 document. So we'd like to replace the c.v. that  
39 was marked as Exhibit 1284 with a redacted version  
40 of that c.v. So it would just be a replacement of  
41 the one that was previously marked.

42 THE REGISTRAR: So marked.  
43

44 EXHIBIT 1284: Replacement c.v. of Stewart  
45 McKinnell with personal information redacted  
46

47 MS. BAKER: And then the last outstanding matter is on

1 the day that we had pulp and mining witnesses,  
2 there were some questions that were left for those  
3 witnesses to complete in writing, and those four  
4 responses have now been received, and I would like  
5 them to be marked in sequence as one exhibit, so  
6 the exhibit and then A, B, C, D, and I'll just go  
7 through them. So the response from Robert Grace  
8 would be the first of that exhibit.

9 THE REGISTRAR: That will be marked 1362.

10  
11 EXHIBIT 1362: Responses to Exhibit 826  
12 (Technical Report 2) - Robert Grace, July 9,  
13 2011  
14

15 MS. BAKER: The next would be the response of Mr.  
16 Hagen.

17 THE REGISTRAR: That will be marked as 1362A.

18  
19 EXHIBIT 1362A: Responses to Exhibit 826  
20 (Technical Report 2) - Michael Hagen, July 8,  
21 2011  
22

23 MS. BAKER: Next would be the response of Douglas Hill.

24 THE REGISTRAR: That will be 1362B.

25  
26 EXHIBIT 1362B: Responses to Exhibit 826  
27 (Technical Report 2) - Douglas Hill, July 8,  
28 2011  
29

30 MS. BAKER: And the last one would be the responses of  
31 Janice Boyd.

32 THE REGISTRAR: That will be 1362C.

33  
34 EXHIBIT 1362C: Responses to Exhibit 826  
35 (Technical Report 2) - Janice Boyd, July 8,  
36 2011  
37

38 MS. BAKER: Thank you. That takes care of my  
39 housekeeping matters, and I'd like to identify  
40 that we're starting today with further  
41 continuation of the marine hearings. Our witness  
42 today is Dr. Jack Rensel. To begin the day, I'd  
43 like to -- we also prepared a Policy and Practice  
44 Report, which was distributed on July 21, 2011.  
45 It's titled "Overview of Marine Environment Issues  
46 Potentially Relevant to Fraser Sockeye Salmon".  
47 I'd like that marked as the next PPR.

3  
Jack Rensel  
In chief on qualifications by Ms. Baker

1 THE REGISTRAR: That will be marked as PPR number 19.

2  
3 PPR19: Policy and Practice Report titled  
4 "Overview of Marine Environment Issues  
5 Potentially Relevant to Fraser Sockeye  
6 Salmon" distributed July 21, 2011  
7

8 MS. BAKER: And then with Dr. Rensel, now we finally  
9 begin with him. So if he could be sworn in,  
10 please.  
11

12 JACK RENSEL, affirmed.  
13

14 THE REGISTRAR: Would you state your name, please.

15 A Jack Rensel.

16 THE REGISTRAR: Thank you. Counsel.

17 MS. BAKER: Thank you. Mr. Commissioner, because we  
18 have limited time for these two days of marine  
19 hearings, I prepared, or had an affidavit prepared  
20 for Dr. Rensel, which has been circulated to all  
21 the participants., and I'd like to have that  
22 marked. That contains the bulk of the direct  
23 evidence that I would be calling from Dr. Rensel.  
24 I also circulated a notice to my friends that I  
25 would be having him qualified as an expert as on  
26 the areas of expertise set out in paragraph 3 to  
27 that affidavit and asked if they would let me know  
28 ahead of time if they had any challenges on  
29 qualifications so that we could move through that  
30 part fairly quickly without having to go through  
31 orally the qualifications. And I have received  
32 nothing from my friends, so I'd like to deal with  
33 the affidavit fairly quickly.  
34

35 EXAMINATION IN CHIEF ON QUALIFICATIONS BY MS. BAKER:  
36

37 Q The affidavit was sworn this morning, although  
38 circulated in unsworn version to the participants  
39 last week. So I will just ask, Dr. Rensel, if you  
40 could identify this is your affidavit on the  
41 screen?

42 A Yes.

43 MS. BAKER: Okay. We'll get that marked please.

44 THE REGISTRAR: That will be marked Exhibit 1363.  
45

46 EXHIBIT 1363: Affidavit #1 of Jack Rensel  
47 sworn August 17, 2011

August 17, 2011

4

Jack Rensel

In chief on qualifications by Ms. Baker

In chief by Ms. Baker

1 MS. BAKER:

2 Q And, Dr. Rensel, your c.v. is attached. I'll just  
3 go through the exhibit. There's the main part of  
4 the exhibit which simply really identifies the  
5 exhibits that are attached. Exhibit A is your  
6 c.v., correct?

7 A Yes.

8 Q Exhibit B is an updated figure which we'll get to,  
9 which is contained in a report that you have  
10 prepared.

11 A That's correct.

12 Q And there we are, there's Exhibit B. And then  
13 Exhibit C is a series of questions that I posed to  
14 you with numbers, and then your answers  
15 underneath, and that carries on for the remainder  
16 of your affidavit.

17 A Yes.

18 MS. BAKER: Okay. Mr. Commissioner, question 1 of  
19 Exhibit C I have asked Dr. Rensel to describe in  
20 summary form the work that he has done and the  
21 expertise he developed relevant to the impact or  
22 potential impact of harmful algal blooms on Fraser  
23 River sockeye. That, coupled with his c.v., which  
24 is Exhibit A, I would submit that his expertise in  
25 the areas that I have identified at paragraph 3 of  
26 his affidavit, we ask that he be qualified as an  
27 expert in the areas of algal zooplankton in marine  
28 and freshwater habitat. This is on paragraph 3 of  
29 the affidavit.

30 I guess you need to see it, don't you.

31 THE COMMISSIONER: Yes, thank you very much.

32 MS. BAKER: Yes, thank you. There should be a spare  
33 copy available. I'll just pass up the original.  
34 So paragraph 3 of that affidavit identifies his  
35 expertise in the areas of algal zooplankton and  
36 marine and freshwater habitats, harmful algal  
37 bloom dynamics, monitoring and mitigation studies,  
38 and fish physiology studies, bioassays and fish  
39 kill assessments, and I ask that he be qualified  
40 in those areas.

41 THE COMMISSIONER: Yes, very well. Thank you.

42 MS. BAKER: Thank you.

43

44 EXAMINATION IN CHIEF BY MS. BAKER:

45

46 Q An article of yours, which we will be referencing  
47 in these hearings, has already been marked as an

5  
Jack Rensel  
In chief by Ms. Baker

1 exhibit in this Commission of Inquiry, that's  
2 Exhibit 1359. If that could be brought up.  
3 That's a paper you prepared?  
4 A Yes, it is.  
5 Q And when in your affidavit you make reference to  
6 the paper, or this is detailed in the paper, is  
7 this the paper you're referring to?  
8 A Yes.  
9 Q Thank you. And was this paper prepared as a  
10 result of some work you were doing for an agency,  
11 or another party of any kind?  
12 A No, it was my personal effort, along with my  
13 colleagues.  
14 Q Thank you. Now, if we could turn to the final  
15 page of this exhibit, or -- I'm sorry, final page  
16 of content, which is actually numbered page 112 on  
17 the journal pages. Thank you. So this sets out  
18 at the bottom of the first column just some  
19 general conclusions, and I just wanted to just  
20 point to that paragraph, but really ask you if you  
21 could explain the correlations that you found in  
22 your work between *Heterosigma* and Chilko, and also  
23 between Chilko and juvenile herring.  
24 A We examined Chilko because, of course, there are -  
25 - it's the only stock that has marine survival  
26 data. We determined that over a 20-year period  
27 when there was available data, both from survival  
28 of the fish and algal blooms, that in those cases  
29 when there was a *Heterosigma akashiwo*, that's the  
30 harmful algae bloom we're talking about in the  
31 paper. When that occurred in the south Strait of  
32 Georgia, in the year when the smolts were out-  
33 migrating, inevitably there would be a correlation  
34 with a poor return two years later.  
35 Q And then with the juvenile herring, how did that  
36 factor in?  
37 A Then the juvenile herring correlation was, which  
38 is Figure 5 in the publication, and updated with  
39 the most recent year, where the correlation was  
40 upheld, that demonstrates or at least strongly  
41 suggests that a major source of mortality to the  
42 fish in the marine waters is occurring in the  
43 Strait of Georgia, and not somewhere else.  
44 Because the juvenile herring and the -- because it  
45 shows the juvenile herring survival for the first  
46 summer at sea as in the Strait of Georgia, and it  
47 matches so strongly with the full two-year

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6  
Jack Rensel  
In chief by Ms. Baker

1 survival of the Chilko stock of sockeye salmon.  
2 Q Right. The figure that you're referring to is on  
3 page 107 of the publication, Figure 5?  
4 A That's right.  
5 Q And then that has been updated by you as Exhibit B  
6 to your affidavit; is that right?  
7 A That's right. And it actually --  
8 Q Maybe we can just wait for him to pull that up on  
9 the screen, and then we can see those. It's after  
10 the c.v. There.  
11 MR. LUNN: Do you want to compare the two?  
12 MS. BAKER:  
13 Q Yes, but the imaging isn't very good unfortunately  
14 on the screen, but...  
15 A But the only point, if I may, the only point on  
16 the one with the poor image is that there's a  
17 general correspondence in the 2008 seawater entry,  
18 2010 return here also for the Chilko stock,  
19 compared to the survival of the herring. And in  
20 the paper we talk about how these factors affect  
21 other fish as well as the salmon, and then this is  
22 evidence of that.  
23 Q Were you able to draw any conclusions about  
24 whether the *Heterosigma* algae is causing any  
25 mortality in juvenile salmon?  
26 A We don't know exactly whether it is direct  
27 mortality, acute mortality, chronic mortality, or  
28 if there's a food web effect, or all of the above.  
29 And likely, given the reputation of the species,  
30 it could be some combination. The fact that in  
31 north Puget Sound when these events were  
32 occurring, we also saw fish dying, wild fish dying  
33 to some extent, and the fish farms were acting as  
34 -- in north Puget Sound were acting as bioassay  
35 indicators to show that this bloom is really  
36 toxic.  
37 And a key component to understand is that the  
38 blooms are unialgal, so when you go out and sample  
39 plankton, when you have a major bloom going on,  
40 you find nothing but *Heterosigma*, a few other  
41 organisms but very, very few. So what's happened  
42 there it's -- it has extirpated those other  
43 organisms through its chemical properties and  
44 taken over the upper water column.  
45 Q Can you just explain how the *Heterosigma* bloom  
46 actually happens, like what is the mechanism where  
47 it goes from cyst to bloom?

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- 1       A     There's no single factor that causes harmful algal  
2           blooms usually, and that's the case with  
3           *Heterosigma*. They generally, in our region and  
4           the Salish Sea, they originate from relatively  
5           shallow sediments, fine sediments in back bays  
6           like English Bay, that's been every year sampled  
7           since 1967. There's been the vegetative form, the  
8           swimming form of the algae that comes out of the  
9           cyst form that's in the sediments has been found.  
10          And then it has to be a combination of weather and  
11          nutrients and freshwater flow, in this case from  
12          the Fraser, sets up a stability in the system that  
13          *Heterosigma* likes. So when all the factors come  
14          together, then you have a large bloom, and then of  
15          course it can be transported or advected to other  
16          areas by winds and tides. And that's what we see  
17          in north Puget Sound is the estuarine flow where  
18          the water is generally moving south to the ocean  
19          along with the Fraser River flow. You see the  
20          export of the blooms killing fish at the fish  
21          farms and the wild fish that we've seen.
- 22        Q     And the blooms that you're seeing in Puget Sound,  
23           are those related in any way to what's happening  
24           in Canada in the Strait of Georgia in our waters  
25           here?
- 26        A     Oh, yes, of course, and it's a political boundary,  
27           and it's one system, and, you know, we provide a  
28           data point in north Puget Sound and in the paper  
29           we talk about our sources of data. We don't have  
30           continuous data in terms of we missed a few,  
31           there's a few years missing. Because we didn't  
32           know at the time, my colleagues that collected the  
33           data, or analyzed the data, Ms. Haigh, from  
34           Nanaimo, didn't know that of course there would be  
35           this connection. So she was collecting data on a  
36           volunteer basis for the south Strait of Georgia,  
37           but the other areas are well sampled, too.
- 38        Q     In our work both locally in the Salish Sea area  
39           and elsewhere in the world, have you seen trends,  
40           either on the frequency or the intensity of  
41           harmful algal blooms?
- 42        A     There's a general agreement in the field of marine  
43           ecology and also algal bloom science that there is  
44           a major increase worldwide going on. I've just  
45           returned from the Arabian Sea and the Gulf of  
46           Oman, where there's a novel species that killed  
47           and wiped out large populations of wild and farmed

1 fish through the United Arabian Emirate, Saudi  
2 Arabia, and a number of other places. And that  
3 same species now occurs in Puget Sound and the  
4 Strait of Georgia. We haven't had major events  
5 with that one, but it's expected that at some  
6 point it will bloom. But worldwide, there seems  
7 to be -- coastal oceans seem to be more affected,  
8 both in intensity of the blooms and the extent of  
9 the blooms.

10 Q And are salmon at risk of any types of harmful  
11 algae, other than *Heterosigma*?

12 A In our areas they certainly are. There's harmful  
13 diatoms that stick in the gills that cause  
14 mortality that I've personally done a lot of  
15 research on. There's a couple of species that are  
16 from the Asian, the South China Sea and Korea,  
17 that are in our areas. My colleague, Ms. Haigh,  
18 who conducts the Harmful Algal Bloom Monitoring  
19 Program, has data for the entire area around  
20 Vancouver Island, both sides, and we just focused  
21 on the *Heterosigma* data. We didn't have the  
22 opportunity or time to look at all the species.

23 Q In Exhibit C, which are your answers to the  
24 questions I posed to you, question number 3 you  
25 refer to work that was formerly done by DFO. If  
26 that could just be pulled up. Question 3 to  
27 Exhibit C, which would be the second page of that.  
28 There we go. In the answer to the question 3 you  
29 say that:

30  
31 Formerly DFO had a harmful algal bloom  
32 research program and researchers at  
33 University of B.C. and Simon Fraser  
34 University were involved in basic research,  
35 but DFO terminated the program about 6 years  
36 ago and the academics either retired or moved  
37 on.

38  
39 Can you just give us a bit more detail about the  
40 work that was done in B.C. previously, and let us  
41 know whether you think any of that work should be  
42 revisited, or would be usefully redone.

43 A I've worked with these people as colleagues, both  
44 at UBC and in DFO, and at the time the focus was  
45 on the effects on farm fish. And at the same time  
46 there were observations being made of a broad  
47 scale that when unusual events occurred were, for

1 example, in 1993 and 1997 there were blooms that  
2 covered the entire Strait of Georgia, north to  
3 south, and lasted for up to four months.

4 And so these people, they were focused on the  
5 near field, sort of looked at the far field. And  
6 one fellow in particular, Max Taylor, Professor  
7 Max Taylor from University of British Columbia,  
8 and his students did a number of studies both in  
9 inlets and throughout the Strait, determining the  
10 significance of the -- not the significance, but  
11 the extent of these blooms, and some idea about  
12 where they were originating and the causes.

13 Q All right. And is there any work that could be  
14 done today with new techniques?

15 A So presently except for the harmful algal bloom  
16 monitoring at fish farms, and of course most of  
17 the fish farms are located further north, there  
18 isn't much monitoring in the south Strait of  
19 Georgia. And, yes, this alga *Heterosigma* is  
20 actually very easy to identify and count when it's  
21 live, very inexpensive to do so, and there's a  
22 number of molecular techniques that weren't  
23 available 20 years ago that are now, that can  
24 embellish the analysis to understand what kind of  
25 *Heterosigma* it is, because there are different  
26 clones or different races of *Heterosigma*.

27 In British Columbia there's the thought that  
28 sometimes the blooms aren't toxic. In Washington  
29 State they're always toxic. We don't understand  
30 that, except that we believe that this is a  
31 difference in environment, and/or the different  
32 types of clones that are -- or ecotypes that are  
33 dominating.

34 Q In these hearings, we have already heard about  
35 chlorophyll as a proxy to measure zooplankton for  
36 fish. Is chlorophyll always a good measure of  
37 secondary production of zooplankton?

38 A Chlorophyll is a good measure of primary  
39 production often, but not always, and it's always  
40 good to know, say if you're using a satellite  
41 image with chlorophyll colour, it's good to know  
42 that to validate that first it's correct, because  
43 if you have interferences like the high amount of  
44 silt that's in the Fraser River, it's difficult to  
45 write algorithms to -- to correct that data so  
46 that it's correct.

47 But also, chlorophyll is not a good measure

1 of the beneficial effect of phytoplankton in all  
2 cases, because, of course, we have and see major  
3 harmful algal blooms which can be killing off  
4 higher organisms in the food web, and in fact do.  
5 And if you were just to use chlorophyll as the  
6 fodder for the food web at all times, you could be  
7 easily misled.

8 Q Are you familiar with a workshop that was hosted  
9 by the Pacific Salmon Commission in June of 2010.

10 A Yes. Yes, I attended that workshop. I was  
11 invited by the U.S. component of the Commission.

12 Q And the proceedings from that workshop have been  
13 marked as Exhibit 73 in this inquiry. And harmful  
14 algal blooms, and in fact your commentary is  
15 summarized in this document, and I just wanted to  
16 take you to two places in this document. At page  
17 9 there's a summary table, which I just wanted to  
18 flag, and you'll see harmful algal bloom  
19 hypotheses is number 4 in that table, and then I'd  
20 also like to take you to page 74, where the  
21 harmful algal bloom section is set out, part of  
22 the section, and there's a conclusion there set  
23 out at section 4.4.5. And have you reviewed these  
24 documents?

25 A Yes, I have.

26 Q Okay. Do you agree with the rating that was given  
27 for the harmful algal bloom hypotheses in the  
28 table page 9, or the conclusions about the  
29 likelihood of the hypothesis being correct, which  
30 are set out on the screen before you at 4.4.5.

31 A Could we go back to that other screen, please.

32 Q Page 9. So you'd like to see the whole table, I  
33 take it.

34 A No, this is fine. These are a list of different  
35 hypotheses and different proofs that could be  
36 causing mortality and poor survival of the Fraser  
37 River sockeye. And the way the workshop was set  
38 up, individuals were assigned a topic and they  
39 were more or less arguing that single topic. And  
40 what's missing here, of course, is that it's very  
41 unlikely that a single cause was a sole cause of  
42 the problem. And I can't agree with it entirely,  
43 of course, because what happened during the  
44 workshop is that small groups got together and  
45 voted, and -- excuse me, there were small groups  
46 got together and discussed their topic, and what  
47 kind of rating it would be, and then the major

1 group reconvened and at that point most of the  
2 U.S. contingent had left, including myself,  
3 because of a travel problem with the ferries. And  
4 so it really was sort of a popularity contest of  
5 which, what your biases were when you came in on  
6 the issue.

7 People generally were surprised about my  
8 talk, which went on for an hour instead of the 20  
9 minutes allotted initially. I was asked a lot of  
10 questions, and I think that it was novel to them,  
11 the idea that this could actually occur. So you  
12 can see that "3b", ocean conditions -- sorry, "3a"  
13 is ocean conditions inside the Strait of Georgia,  
14 and that was generally represented by Dr. Dick  
15 Beamish, and number "4" was the harmful algal  
16 bloom hypothesis. And so people had different  
17 opinions and they stuck with those opinions. And  
18 I don't -- I was the only harmful algal bloom  
19 scientist there, of course -- not of course, but  
20 that was the fact, and so it was a voting and you  
21 take it for what it's worth, I guess.

22 Q Was there causal evidence presented in relation to  
23 any of these theories, or is it all about  
24 correlations on the data?

25 A This whole meeting was really about correlation  
26 and the data that I presented and subsequently  
27 published in the paper showed very high  
28 correlations, and if you were just to vote based  
29 on correlations, the harmful algal bloom  
30 hypothesis should have been the very likely one.  
31 And I've discussed with Dr. Dick Beamish about  
32 several times and corresponded with him since then  
33 about how "3a", the ocean conditions inside the  
34 Strait of Georgia are really no different than  
35 number 4, the harmful algal bloom hypothesis;  
36 they're really subsets of the same topic.

37 Q So the conditions in the Strait of Georgia that  
38 gave rise to harmful algal blooms could also be  
39 the same conditions that were contributing to the  
40 causes that are hypothesized by Dick Beamish, is  
41 that fair?

42 A That's right, and I think Dr. Beamish agrees to  
43 that now.

44 Q In 2010 fish came back in great numbers, as you  
45 know, and how do you reconcile the fact that they  
46 -- those fish were in the Strait of Georgia as  
47 juveniles in 2008 and there was a large harmful

1 algal bloom in the Strait in 2008.  
2 A Different stocks. We know a little bit more about  
3 the Chilko stock as far as the juveniles emerging  
4 into the sea, coming out of the river. Apparently  
5 the 2010 run was a different stock that was  
6 dominant. And the timing of the bloom, the major  
7 bloom that was a level 3 out of the 1 through 3  
8 category, wasn't until the third week of June when  
9 most of the Chilko fish would have been -- would  
10 have already gone into the Strait, and most of  
11 them actually moved out of the Strait. So that  
12 this whole thing with harmful algal blooms is all  
13 about timing. What was unique about 2007 was we'd  
14 never seen a *Heterosigma* bloom in May, and it  
15 coincided with the peak of the outmigration.  
16 So others, Brian Riddell and others who were  
17 involved in the workshop, were quite certain that  
18 and voiced the opinion that it looked very likely  
19 that this was a major cause in 2007. But again,  
20 other people have said ocean conditions were bad  
21 up north in Queen Charlotte Sound and further  
22 north, and I don't disagree there was probably a  
23 lack of food there. So it would a one-two punch,  
24 maybe a one-two-three punch, if you consider the  
25 Gulf of Alaska being in poor condition that year,  
26 too.  
27 Q While we have Exhibit 73 on the screen, if you  
28 could turn to pages 74 to 75, it sets out some  
29 proposed research to be done to better understand  
30 harmful algal blooms in our waters. Have you  
31 reviewed that proposed research, or those proposed  
32 research ideas?  
33 A Yes, I have. Let me see, though. This is the  
34 summary from the 2010 workshop, right?  
35 Q That's right.  
36 A Right. I actually haven't reviewed it in the last  
37 several days, so I'd have to look at it a little  
38 bit here, but go ahead on it.  
39 Q I was just going to ask if you had any -- if you  
40 agreed with those recommendations or you felt that  
41 they were reasonable recommendations.  
42 A So it's calling for monitoring, looking at using  
43 remote sensing, studying the causes of the  
44 mortality to the fish that needs to be done and  
45 we're actually doing in Washington State right now  
46 with NOAA. So, yes, I would generally agree with  
47 these.

- 1 Q Okay. And then Canada's list of documents,  
2 document number 3, they have included a draft  
3 summary report from a DFO synthesis workshop held  
4 in April of this year, 2011, and it appears to be  
5 revisiting the results from the PSC workshop that  
6 we just looked at. If that document number 3 on  
7 Canada's list could be pulled up. And I take it  
8 you weren't invited to this.
- 9 A No, I was not.
- 10 Q If you turn to the page 4 of this document,  
11 there's a reprint of the table that we've already  
12 looked at, although they've put "Xs" on certain of  
13 the theories -- oh, sorry, page 3, and it has a  
14 note at the top that says "X" indicates the re-  
15 evaluated ranking from the outcomes, and you'll  
16 see that number 4 has changed slightly. Do you  
17 have any comments on this, that they -- and I'm  
18 really just asking if you can relate this to the  
19 evidence you've already given on the PSC table.  
20 Does anything change when we look at the revised  
21 table here?
- 22 A I believe this was -- this workshop was just for  
23 DFO employees; is that right?
- 24 Q That's my understanding, yes.
- 25 A Right. And so I don't take offence that I wasn't  
26 invited. They've bumped up the hypothesis to  
27 "possible", is all I can say.
- 28 Q All right. But your comments earlier about the  
29 same conditions as represented in "3a" and in  
30 number "4" would apply still?
- 31 A Right. And I think I saw, I asked for in some of  
32 the correspondence that was email correspondence  
33 among DFO employees, and I was pleased to see that  
34 people were discussing the harmful algal bloom  
35 hypothesis subsequent to my first contacting Dick  
36 Beamish in 2009. And so I think people are  
37 thinking more about it, a number of people.
- 38 Q All right. And then page 5 of this document  
39 that's on the screen, at the bottom there you can  
40 see Jim Irvine was the one who talked about  
41 harmful algal blooms, and he sets out some  
42 research requirements at the last bullet under  
43 that heading, "Harmful Algal Blooms", and would  
44 you -- do you have any comments on those research  
45 requirements?
- 46 A Jim Irvine, I worked with him when I was -- when  
47 my colleagues and I were preparing the paper. He

14  
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1           was assigned by DFO to work with us to provide  
2           information and to help us, and he did a good job,  
3           and I agree with what he said here.

4 MS. BAKER: Could I have this document marked as the  
5           next exhibit, please.

6 THE REGISTRAR: That will be Exhibit number 1364.

7  
8                         EXHIBIT 1364: Draft Summary Report, DFO  
9                         synthesis workshop on the decline of Fraser  
10                        River sockeye, April 14-15, 2011

11  
12 MS. BAKER: Thank you.

13 Q       And the last question I have for you, in the  
14       Commission document number 19 there's a summary of  
15       a harmful algal bloom monitoring program that was  
16       prepared by, I understand, Nicky Haigh. Have you  
17       had a look at this document before?

18 A       Yes, I looked at it yesterday.

19 Q       And do you have any comments on whether this is a  
20       reasonable monitoring program for harmful algal  
21       blooms?

22 A       Well, it's really a proposal to have a monitoring  
23       program that would be beyond what just the fish  
24       farmers do, and she's an independent contractor,  
25       but -- and very capable of doing what she does,  
26       but there's quite a limitation in where she can  
27       get samples from.

28 Q       Right. Would you support this kind of monitoring  
29       program?

30 A       Yes, I would.

31 MS. BAKER: All right. I'll have that marked, please.

32 THE REGISTRAR: Exhibit 1365.

33  
34                         EXHIBIT 1365: Haigh, assessing the impact of  
35                         harmful algal blooms on wild salmon  
36                         populations in B.C.: planning for a HAB  
37                         monitoring program

38  
39 MS. BAKER: Thank you. And those are the questions I  
40       have for Dr. Rensel. Canada will follow me.

41 MS. GRANDE-McNEILL: Geneva Grande-McNeill for Canada  
42       with Tim Timberg.

43  
44 CROSS-EXAMINATION BY MS. GRANDE-McNEILL:  
45

46 Q       If we can have Exhibit 1359, Dr. Rensel's paper,  
47       and if we could go to page 1 near the bottom of

1 the second column, Dr. Rensel, you write:  
2

3 Previously, harmful algae have never been  
4 directly linked with significant losses of  
5 wild salmon in coastal oceans, although some  
6 observations of dead wild salmonids in  
7 shallow inlets or along beaches of deeper  
8 areas have occurred with every major  
9 *Heterosigma* bloom observed in North Puget  
10 Sound in the past two decades and recurring  
11 wild fish kills have occurred in other  
12 regions, as described below.  
13

14 So you write that there's never been a direct  
15 link. Would you agree that there's still no known  
16 or established causal link between harmful algae  
17 and significant losses of wild salmon?

18 A I agree that we haven't seen the forensic evidence  
19 of the -- of the carcasses, and if I may just  
20 briefly explain. You will see pictures of fish  
21 kills in the tropics and the semi-tropical areas,  
22 most extensively in Hong Kong, where there were --  
23 the government hired us to look at major problems  
24 with algal blooms there, and you will see huge  
25 rafts of dead fish, and both wild and farmed, and  
26 there the water is quite warmer, the bacterial  
27 action in the gut of the fish and inside the fish  
28 causes gas production and they float up very  
29 rapidly. And the paper goes into great extent  
30 explaining how our fish in these waters mostly  
31 sink, just as they do in fish farms. Over 99  
32 percent of them, is my estimate, sink in the fish  
33 farms, and then they sink out of the warmer  
34 surface layer to the deeper layer that is cool.  
35 And so the rate of refloating could be low, you  
36 have predators in the deep water, as well as the  
37 shallow water. So the paper goes on about that to  
38 an extent.

39 Q Right. And so but in B.C. waters for wild  
40 salmonids, do we know if there's an established  
41 causal link to *Heterosigma*, and --

42 A No, we don't. No.

43 Q We don't. And you'd agree we don't know by what  
44 mechanism, if any, *Heterosigma* may be causing  
45 mortality?

46 A No, that's not true. In some cases we've seen,  
47 and I personally have prime knowledge and

- 1 collected gill samples and seen massive changes to  
2 the histology, the cell structure of the gills.  
3 And the most common hypothesis is that a hydrogen  
4 peroxide-like compound is released by the alga,  
5 and causes this injury to the gills. But there's  
6 also evidence, the Japanese have published papers  
7 showing that toxins have been produced,  
8 brevetoxins in particular have been produced. I  
9 think the paper gets into that, too.
- 10 Q And so your paper does discuss some of the  
11 hypotheses of the mechanism. But you write, and  
12 if we go to page 3 --
- 13 A I'm sorry, I couldn't hear you.
- 14 Q Sorry. If we turn to page 3 of the paper and near  
15 the bottom of the first column on the left, you  
16 write:
- 17  
18 Several possible causes of fish mortality  
19 from exposure to *Heterosigma* have been  
20 proposed but no single cause has been  
21 indisputably identified.  
22
- 23 And then you go on to discuss some of the theories  
24 that you've just mentioned.
- 25 A Yes.
- 26 Q And so you'd agree we don't actually know what  
27 mechanism may be at play.
- 28 A No. And I think it actually -- the paper goes on  
29 to discuss how there's different clones or  
30 different ecotypes of *Heterosigma* that exist, and  
31 it's very likely that they have different  
32 manifest, different mechanisms of mortality, just  
33 as they have different growth rates, different  
34 behaviours. So we're not -- we're dealing with  
35 one genus species, but within that genus species  
36 there's a large repertoire of behaviour.
- 37 Q And do we know, you mentioned earlier that  
38 sometimes it is toxic and sometimes it's not. Do  
39 we know what environmental or other trigger might  
40 cause *Heterosigma* to become toxic?
- 41 A It's clear from the work that I've done in the  
42 laboratory at the University of Washington with my  
43 colleagues that a bacterial cofactor is important.  
44 It's very difficult, actually it's impossible to  
45 kill fish in the laboratory with an axenic or pure  
46 culture *Heterosigma*, but in -- I'm sorry, the  
47 focus of your question was...?

- 1 Q Do we know causes *Heterosigma* to become toxic, to  
2 become (indiscernible - overlapping speakers).  
3 A Oh, okay. Yeah, we don't know exactly, but it's  
4 common with harmful algal blooms to have some  
5 variability in toxicity depending on the growth  
6 stage. In other words, are they growing  
7 exponentially, are they becoming senescent, some  
8 are toxic in one phase, some are toxic in another.  
9 I could speculate more, but there's a need for  
10 some more research on that.
- 11 Q Okay. And you've touched on this, but is it fair  
12 to say that while you hypothesize that *Heterosigma*  
13 may be a factor in Fraser sockeye mortality, there  
14 may be also indirect sub-lethal or cumulative  
15 effects involved?
- 16 A Yes.
- 17 Q At this point I guess we don't know enough to know  
18 whether *Heterosigma* blooms are directly causing  
19 mortality, or whether they're one of cumulative or  
20 co-occurring stressors?
- 21 A We don't know that, that's correct, and we don't  
22 know -- it's a little bit of the chicken and the  
23 egg. You get these conditions and you have  
24 *Heterosigma*, and the *Heterosigma* didn't cause the  
25 physical conditions, but it takes advantage of it  
26 and then the other species that are normally  
27 present are at a disadvantage.
- 28 Q Right. Now, on those conditions, what are some of  
29 the factors that are contributing to this  
30 increased incidence and earlier timing shift of  
31 *Heterosigma* blooms in the southern Strait of  
32 Georgia?
- 33 A The 2007, and actually the paper shows that the  
34 very profound importance of the early and large  
35 discharge of the Fraser River in setting the  
36 conditions. Again, another correlation, but one  
37 that fits exactly with what the known *modus*  
38 *operandi* of the alga, in other words its strategy.  
39 It does very well in brackish water. And so the  
40 south Strait of Georgia has always probably been a  
41 great place for *Heterosigma*. And in 2007 again we  
42 believe that it was the fact that this was a very  
43 early high discharge that occurred and followed by  
44 sunny weather that set up the condition.
- 45 Q Right. So earlier than normal and prolonged  
46 peaking of Fraser River discharge, that was a  
47 contributing factor?

- 1 A I didn't hear the last part, Fraser River...
- 2 Q Right. Earlier than normal and prolonged peaking  
3 of Fraser River discharge, that's a factor?
- 4 A Well, yeah, but it's from the -- from the fish  
5 point of view they're only going to spend maybe  
6 five, six weeks in the Strait of Georgia, so it's  
7 a timing issue. And if it goes on, like this  
8 year, the levels have been way above the averages,  
9 and the upper confidence levels, for 75 percent  
10 levels of the whole summer, but it doesn't really  
11 matter to the fish if they're out in the ocean.
- 12 Q All right. And would sea surface temperatures and  
13 increased sea surface temperatures or increased  
14 air temperatures, would that -- would those play a  
15 role, as well?
- 16 A There's a direct relationship with faster growth  
17 with increasing water temperature with algae, with  
18 phytoplankton, and there's also the issue of 15-  
19 degree water temperature for the sea beds where  
20 these things are overwintered as cysts. And so  
21 the evidence is that I reviewed in the paper that  
22 there's a steady multi-decade, 50- to 70-year  
23 increase in water temperatures in the Strait of  
24 Georgia, surface water and deep water.
- 25 Q And so all these factors, the earlier than normal  
26 and prolonged peaking of Fraser River discharge,  
27 the increased sea surface temperature, increased  
28 air temperature, are these all factors that are  
29 linked to climate variability or climate change?
- 30 A Undoubtedly they are, you know, the -- I'm not an  
31 expert in that, so...
- 32 Q Thank you. Now, your paper on pages 14 and 15,  
33 you recommend some further monitoring and research  
34 that you think needs to be done for your  
35 hypothesis. And some of what you suggest could  
36 include a direct sampling, automated molecular  
37 monitoring and remote sensing; is that right?
- 38 A That's right.
- 39 Q And that could include satellite chlorophyll  
40 tracking?
- 41 A Possibly, it -- satellite chlorophyll has never  
42 really -- it's a difficult thing to use in the  
43 Strait of Georgia because of the turbidity from  
44 the river, but it's possible to use it if you had  
45 some ground truthing.
- 46 Q Okay. And this could include fixed-wing aircraft  
47 surveys, you suggest?

- 1 A Right. It's a unique thing about *Heterosigma* that  
2 a trained observer who is experienced can actually  
3 fly at 1,500 feet or 3,000 feet and see the bloom  
4 and identify with pretty good veracity the  
5 *Heterosigma* bloom, because there's a  
6 characteristic colour that you see from the air.  
7 And you actually don't even see that colour from a  
8 boat, but you do from the air. And so what is  
9 done in Puget Sound is that small planes go up and  
10 chart the extent of the blooms in relationship to  
11 the fish farms as a management tool, so they know  
12 that they need to invoke mitigation.
- 13 Q Okay.
- 14 A And I've done a number of those flights.
- 15 Q And you also suggest that there could be studies  
16 of acoustically tagged smolts to determine overlap  
17 with and behaviour near *Heterosigma* blooms?
- 18 A I'm sorry, I didn't hear...
- 19 Q Sorry?
- 20 A Again I couldn't hear you. I'm sorry.
- 21 Q This also includes studies of acoustically tagged  
22 smolts to determine overlap with and behaviour  
23 near *Heterosigma*?
- 24 A Yes, thank you. The sort of thing that Dave Welch  
25 does, that's right.
- 26 Q Right.
- 27 A Yeah, that's very important.
- 28 Q Right. And it could include genetic analysis of  
29 *Heterosigma* as well, because you mentioned already  
30 some of the different ecotypes.
- 31 A Well, we've made a lot of recent gains on that in  
32 Washington State, and it's likely that that  
33 information would be valid for the south Strait of  
34 Georgia.
- 35 Q Okay. And you note that there are other algae  
36 species in the Strait of Georgia that might be  
37 worth considering in addition to *Heterosigma*, as  
38 well.
- 39 A Yes.
- 40 Q Okay. And I'm just wondering, what would be your  
41 estimate of some of the costs involved with  
42 conducting all this research and monitoring that  
43 you've suggested in your paper?
- 44 A I think that the costs could be -- the initial  
45 monitoring is actually very inexpensive. I  
46 hesitate to say a number, because that would be--  
47 but the fact is that there is this algal bloom

Jack Rensel

Cross-exam by Ms. Grande-McNeill (CAN)

Cross-exam by Mr. Blair (BCSFA)

1 monitoring program in place, and if there were  
2 protocols and chains of custody and so forth are  
3 set up so that that everyone would follow the  
4 same. The idea would be that different people  
5 working in different areas would contribute  
6 because they're already mobilized. The large  
7 costs are simply getting to the area and getting  
8 the sample, not working up the sample.

9 So for example, in the south Strait of  
10 Georgia, someone from the University of British  
11 Columbia, and they still are sampling in English  
12 Bay every year for the newly emerged phytoplankton  
13 *Heterosigma* that germinate, but they could use a  
14 small boat and go out and sample. So and then  
15 obviously at the Nanaimo Marine Biological  
16 Station, that would be a good place to sample, and  
17 someone could easily sample there. The samples  
18 can be preserved or shipped fresh. So basically  
19 just the basic monitoring is not expensive at all.

20 Q And what about some of the other research, for  
21 example, the genetic analysis, the studies of  
22 acoustically tagged smolts, over-flights,  
23 laboratory studies on load of toxicity.

24 A Right. All those things run into the more serious  
25 money, and some of those would be done through the  
26 academic organizations that are -- that would be  
27 skilled to do it, that would probably compete for  
28 grants and contracts. And there's a place for  
29 government in this, too, I'm sure, possibly.  
30 Although it was apparently decided in 2006 that no  
31 more harmful algal bloom was going to be done by  
32 DFO.

33 MS. GRANDE-McNEILL: Thank you, those are my questions.

34 MS. BAKER: Thank you. Next we have Mr. Blair for 15  
35 minutes.

36 MR. BLAIR: Mr. Commissioner, Dr. Rensel, Alan Blair  
37 appearing for the B.C. Salmon Farmers Association.  
38 Mr. Lunn, could you put up the Salmon Farmers' Tab  
39 1, please.  
40

41 CROSS-EXAMINATION BY MR. BLAIR:  
42

43 Q Dr. Rensel, I'm assuming that you've had an  
44 opportunity in your preparation for coming to the  
45 hearings to look at some or all of the documents  
46 that various participants have put forward?

47 A Actually not.

1 Q No?

2 A I'm in the thick of a -- we not only have toxicity  
3 in Puget Sound, but in the Columbia River right  
4 now, so I'm -- unfortunately business is booming,  
5 or maybe I should say blooming for me.

6 Q I'm glad to be able to provide the opportunity for  
7 you to use that line. I'll assume then perhaps  
8 you've not read this document, and also for your  
9 purposes I'll explain the context. This document,  
10 as you can perhaps tell from the face sheet, is  
11 questions and answers. It was specifically  
12 prepared by my client, the B.C. Salmon Farmers  
13 Association under the direction of a Dr. Tom  
14 Watson, who is a Senior Environmental Biologist  
15 with Triton, and a number of people who are  
16 contributors.

17 Perhaps, Mr. Lunn, you could just pull up  
18 this list of contributors at the bottom.

19 Some of those names if you can you see them,  
20 might be familiar to you. This document was an  
21 attempt by my client to answer in sort of layman's  
22 terms some of the questions around the aquaculture  
23 industry in British Columbia.

24 And Mr. Lunn, I wonder if you could look at  
25 PDF 50, please, page 50. You'll see here in this  
26 document, Dr. Rensel, the question is posed, as it  
27 is throughout the entire piece, questions posed  
28 and then answers provided, footnoted. And by the  
29 way, question 55, which is:

30  
31 Do farms cause *Heterosigma* blooms?  
32

33 You'll note there's a reference, footnote  
34 reference at 287, which is Dr. Ken Brooks' paper,  
35 which is also indexed, and I'll refer to Dr.  
36 Brooks' paper.

37 Firstly, do you know Dr. Ken Brooks?

38 A Yes, I do.

39 Q Yes, all right. Could you just read that -- that  
40 answer to that question and let me know whether or  
41 not you agree with that conclusion? It's really  
42 the conclusion of Ken Brooks, and merely footnoted  
43 in this document by Dr. Watson and his team.

44 A I guess I can't agree with it, no. It says that:

45  
46 *Heterosigma* blooms occur naturally in shallow  
47 bays with significant freshwater inputs and

1                   minimal flushing.  
2

3                   But we know that *Heterosigma* covers entire basins  
4 of Puget Sound and the Salish Sea and the Strait  
5 of Georgia at times, so I can't agree with that.

6                   It's true that it would be poor to have fish  
7 farm sites in those shallow bays, and in fact they  
8 were there in the '70s when I first started in the  
9 field.

10                  Just let me read the second paragraph.

11           Q       I wonder before you get to the second paragraph --

12           A       Okay.

13           Q       -- we should break down the first paragraph.

14                   There's two thoughts in the first paragraph. The  
15 first is whether or not there's potential for  
16 finfish to cause enhancements in phytoplankton  
17 populations, and the conclusion of Dr. Brooks is  
18 that that potential is "remote or non-existent".

19           A       I would have to qualify my answer to say it  
20 depends on where you're talking about. It's not,  
21 you know, I wouldn't agree with that in there are  
22 certain situations where it would be very likely  
23 that it could contribute to them. And I don't  
24 have any prime firsthand knowledge of the nutrient  
25 sensitivities of the sites in British Columbia.

26           Q       You're quite familiar with the aquaculture  
27 industry in Washington State; is that correct?

28           A       Yes.

29           Q       And so in the context of your familiarity with  
30 those particular sites, did you find correlations  
31 between Washington State fish farms and the  
32 enhancement of or the potential enhancement of  
33 potentially harmful algal blooms?

34           A       In Washington State the regulations that I work  
35 with, the Department of Ecology helped develop  
36 over 20 years ago, require that -- and the  
37 Department of Natural Resources require that fish  
38 farms be located in non-nutrient sensitive areas.  
39 Those are areas where there are levels of nitrogen  
40 which is usually the limiting factor are so high  
41 that naturally from inputs from the ocean, that  
42 other factors such as the availability of  
43 sunlight, limit their population, as well as  
44 advection or transport of the blooms mixing in  
45 with the deep layer, those sorts of things. So in  
46 Washington State, I could say that it would be  
47 true, the first sentence would be possibly true.

1 But any time you put nitrogen in the sea, you can  
2 never guarantee that that molecule of nitrogen  
3 that you put in won't end up in an algal cell.  
4 Usually it's a good cell, it's a beneficial thing,  
5 but you can't -- there's no axiomatic no, no  
6 effect.

7 Q Is it your conclusion looking at this over a  
8 number of years that sunlight is a more  
9 predominant trigger than nitrogen to the  
10 stimulation of *Heterosigma* blooms?

11 A Sunlight is a requirement, of course, for most  
12 algal blooms, and days when you have storms, a low  
13 pressure front moving in, rain, you're less likely  
14 to see a bloom initiate. But blooms have a way of  
15 occurring unexpectedly any time of year.

16 Q So I think I hear you saying sunlight is a  
17 requirement for the bloom and nitrogen is a  
18 contributor, potentially?

19 A Nitrogen is another -- another requirement. Being  
20 exposed and being in the right depth so that you  
21 can take advantage of both, or being able to  
22 migrate to the right layer, like *Heterosigma* does.  
23 So it's a whole number of factors, and we have  
24 developed conceptual models of why blooms occur.  
25 And we know now, and we can actually predict very  
26 well in Puget Sound within about a week when the  
27 blooms are going to occur. If we know that  
28 there's neap tides at certain time of the year,  
29 because we know that the cysts are more likely to  
30 be germinating and the time period of June, July  
31 and again in September, those are high risk  
32 periods. Like you said, the sunny weather helps.  
33 Calm conditions sometimes help, but I've seen  
34 blooms during wind events also. So there's  
35 nothing really exact about it at this point, we  
36 just -- but it's got to the point where the fish  
37 farmers actually don't rely on the academic people  
38 to do their predictions. They do them pretty much  
39 on their own.

40 Q And that's because?

41 A That's because they know their sites and they know  
42 where the blooms are coming from, usually from up  
43 north in the border areas, and the south Strait of  
44 Georgia, but also some of the small bays that are  
45 along our coastline. And because they go out and  
46 monitor by airplane and they track these things.

47 Q No counsel ever means to cut off a witness, but we

1 all have very tight time constraints so I'm going  
2 to move along, if I may.  
3 A Sure.  
4 Q So the second sentence in that first paragraph,  
5 you took exception to it, and I think you said,  
6 well, *Heterosigma* blooms can occur across an  
7 entire area, for example, Strait of Georgia.  
8 You'll agree that that statement is true, that  
9 they can occur in shallow bays, they can also be  
10 system-wide, correct?  
11 A That's right.  
12 Q So the statement is true, but it should be taken  
13 in the context of in addition to shallow bays when  
14 they start, you mentioned English Bay in  
15 particular, they can also spread across the entire  
16 system.  
17 A Yes.  
18 Q And the next statement is also true:  
19  
20 These sites are considered poor locations for  
21 fish farms.  
22  
23 In part because of poor flushing and perhaps the  
24 likelihood of a bloom.  
25 A Yes.  
26 MR. BLAIR: I wonder whether we could mark that Tab 1  
27 as the next exhibit, please.  
28 THE REGISTRAR: Exhibit number 1366.  
29  
30 EXHIBIT 1366: Watson, Questions and Answers  
31 on Salmon Aquaculture in British Columbia,  
32 Volume 2, August 16, 2011  
33  
34 MR. BLAIR: And I have directed the witness, Mr.  
35 Commissioner, to the footnote which is footnoted  
36 in that exhibit now, footnote number 287, which is  
37 also our Tab 2, a paper by Dr. Kenneth Brooks. I  
38 wonder if that could also be marked the next  
39 exhibit.  
40 THE REGISTRAR: Exhibit 1367.  
41 MS. BAKER: What tab is that in?  
42 MR. BLAIR: It was our Tab 2.  
43 MS. BAKER: Perhaps the witness could just identify the  
44 document.  
45 MR. BLAIR: Mr. Lunn, if you'll provide Tab 2.  
46 MR. LUNN: It's on the screen.  
47 MR. BLAIR: Oh, thank you.

1 Q Dr. Rensel, this was the -- this is the paper that  
2 I said was footnoted in the last exhibit that I  
3 referred you to. You indicated you're familiar  
4 with Dr. Ken Brooks.

5 A Yes, and this appears to be a technical report.

6 MR. BLAIR: Thank you. The next exhibit, please.

7 MS. BAKER: I'm not sure that he's actually identified  
8 that he knows anything about the report, he just  
9 said it appears to be a technical report.

10 MR. BLAIR: Mr. Commissioner, we tendered the last  
11 exhibit with the footnote and asked him, the  
12 witness, specific questions around this, whether  
13 he agreed with it or not, whether he knew Mr.  
14 Brooks, and I think his answer has been that the  
15 qualifications he's made with his own knowledge,  
16 he knows Mr. Brooks and largely agreed with the  
17 footnote that I referred to. So this is the  
18 underlying document.

19 MS. BAKER: I don't think he actually agreed with it.  
20 I think he qualified it quite extensively, and I  
21 don't want to create a big issue, but if the  
22 witness is going to identify this document and  
23 it's being put in as a footnoted document to  
24 another document that he hadn't read before he was  
25 sitting in the witness stand, I'm not really sure  
26 what the value of this is. My friend will be  
27 participating in several weeks of aquaculture  
28 hearings coming up. I'm sure that this document  
29 that's now been marked will be tendered and  
30 reviewed extensively in that hearing, and perhaps  
31 that's a more appropriate time to deal with this,  
32 as the authors, I'm assuming, will be present and  
33 able to answer questions about what they relied on  
34 and what they didn't rely on.

35 MR. BLAIR: We could perhaps do it that way, Mr.  
36 Commissioner.

37 Q But if I could just for a moment direct Dr. Rensel  
38 and Mr. Lunn to page 11 of the report, that is our  
39 Tab 2, PDF page 25, page 11 on the actual paper  
40 document. And, sir, right down at the second-last  
41 paragraph, starting "Taylor and Horner", the very  
42 last line ending with the words:

43  
44 ...potential for net-pen enhancement of  
45 phytoplankton populations is remote or non-  
46 existent.  
47

1           You see that line, do you, sir, just before the --  
2   A       Yes, I see the line.  
3   Q       Yes. Now, this is -- this is the quote that Dr.  
4           Watson's Q&A referred to in Dr. Brooks' paper. Do  
5           you agree with that statement that I've just  
6           highlighted:  
7  
8                     ...potential for net-pen enhancement of  
9                     phytoplankton populations is remote or non-  
10                    existent.  
11  
12   A       No.  
13   Q       You disagree with that.  
14   A       For the same reasons I've stated before. I should  
15           state, too, that Dr. Brooks is well-known in the  
16           field of benthic ecology, that he has not  
17           published in the field of phytoplankton dynamics  
18           and harmful algal blooms.  
19   THE REGISTRAR: Excuse me, Mr. Blair, I'm not clear  
20           whether that last document was to be marked or  
21           not.  
22   MR. BLAIR: I'm going to withdraw our request to mark  
23           it now and perhaps follow Ms. Baker's suggestion  
24           that we put it to the Project 5 reviewers who will  
25           most certainly have looked at it in greater  
26           detail.  
27   THE REGISTRAR: Thank you very much.  
28   MR. BLAIR: Thank you. Mr. Lunn --  
29   MR. LEADEM: Just before -- sorry, Mr. Blair, and I  
30           don't mean to intrude, but I would actually think  
31           that given the exchange and the actual passage  
32           that was put to the witness and his not agreeing  
33           with it, it ought to be marked so that we have  
34           something in evidence that reflects this  
35           discussion.  
36   THE COMMISSIONER: I think we could mark it for  
37           identification purposes, Ms. Baker and Mr. Blair,  
38           and as you suggest, Mr. Blair, you'll deal with it  
39           at another time.  
40   MR. BLAIR: I'm agreeable to that, thank you.  
41   THE REGISTRAR: The document will be marked as letters  
42           "JJ", double "J".  
43  
44                     JJ FOR IDENTIFICATION: Brooks, Stolt Canada  
45                     Arrow Pass Salmon Farm Benthic and Shellfish  
46                     Effects Study 1996 to 1997, 2001  
47

27  
Jack Rensel  
Cross-exam by Mr. Blair (BCSFA)

1 MR. BLAIR: Thank you. Mr. Lunn, B.C. Salmon Farmers  
2 Tab 5.  
3 MR. LUNN: This is also Exhibit 1327, it's marked as  
4 your Tab 5.  
5 MR. BLAIR: Thank you. Oh, I'm sorry. I meant Tab 4,  
6 pardon me.  
7 Q This one might look more familiar, Dr. Rensel.  
8 A Yes.  
9 Q This is your document?  
10 A That's correct.  
11 Q And my question for you, and I'll refer you to  
12 some specific passages in the document if  
13 necessary, sir. But do you agree it's true that  
14 the benthic impacts from salmon farms are now  
15 fairly understood in terms of the -- the influx of  
16 waste from salmon pens and their near field fate?  
17 A I'm sorry, did you say the benthic impacts or...?  
18 Q Yes. Yeah.  
19 A It is fairly well understood, yes, and I'm  
20 actually involved in computer modeling of that, so  
21 I do a lot of work with it.  
22 Q I wonder if we could go to PDF page 10, Mr. Lunn,  
23 and starting with the paragraph just immediately  
24 above the photo, this speaks to that very issue.  
25 I think you're thinking, sir, but my question  
26 was does this speak to that issue and does it  
27 summarize your view? I've asked you to read the  
28 paragraph starting "The flux of waste products  
29 from".  
30 A Oh, I'm sorry, I was waiting for you to pose a  
31 specific question. I'm talking about Washington  
32 State and where --  
33 Q Yes.  
34 A -- salmon farms are located again, so there's not  
35 -- there's no change in my -- my position.  
36 MR. BLAIR: Thank you. Could this be marked the next  
37 exhibit, please.  
38 THE REGISTRAR: That will be marked as Exhibit number  
39 1367.  
40  
41 EXHIBIT 1367: Rensel and Forster, Final  
42 Report, Beneficial Environmental Effects of  
43 Marine Finfish Mariculture, 22 July 2007  
44  
45 MR. BLAIR: Thank you.  
46 Q Can we go to Commission Tab 30, please. Dr.  
47 Rensel, are you familiar with this submission by

August 17, 2011

1 Nicky Haigh?

2 A Yes, I am.

3 Q It's dated November 2010. My question relating to  
4 this particular document, sir, is a question with  
5 respect to how long some of the blooms have  
6 lasted, and the likely impact on food webs, as  
7 well as any direct toxic effects. And if the  
8 witness could be shown pages 1 and 2.

9 MR. LUNN: Would you like those side-by-side, or...

10 MR. BLAIR: If you can, please, yes.

11 Q Just while it's being brought up, sir, on page 1  
12 will be a quote from the Haigh document which  
13 states:

14  
15 The recurring and persistent HABS seen in  
16 this area may be responsible for a great deal  
17 of the low returns and decline of Fraser  
18 River sockeye since 1989, and in particular  
19 the disastrous return in 2009.

20  
21 And that's the quote that we're looking for, which  
22 is at the end of the first paragraph, and in a  
23 moment on the other page...

24 MR. LUNN: I'm sorry, I thought you wanted full pages.

25 MR. BLAIR: I did. If we can just see the end of the  
26 summary enlarged so we can read it to the left.

27 MR. LUNN: Do you mean like that?

28 MR. BLAIR: No, sorry, the end of the paragraph called  
29 "Summary". Yes.

30 Q I'm trying to speed it up, sir, by reading that to  
31 you. I'm not sure that I did. You now see the  
32 sentence there just above the words  
33 "Introduction", starting with "recurring and  
34 persistent" --

35 A Yes.

36 Q -- "HABS".

37 A I'm sorry, yes, I do.

38 Q Yes. Do you agree with that statement?

39 A Yes.

40 Q I'm sorry, you said yes?

41 A Yes, I said yes.

42 Q Thank you. And if we went to on page -- the  
43 second page, the paragraph starting:

44  
45 During *Heterosigma* blooms, other algae and  
46 most zooplankton disappear...

47

1 A Are you asking me if I agree with another sentence  
2 here, or...  
3 Q I'm trying to take us there.  
4 A I believe I edited this document, that she sent it  
5 to me for review, so I probably will say I agree  
6 with things.  
7 Q So that's a yes, again?  
8 A I'm not going to give a blanket --  
9 Q Okay. Then we'll --  
10 A -- because I don't know exactly what she  
11 submitted.  
12 Q -- find the page, if I may. Wrong binder, my  
13 apologies. Right where your little hand is Mr.  
14 Lunn, if you'll expand that paragraph.  
15 MR. LUNN: I can just take this full page, that would  
16 be easier.  
17 MR. BLAIR: Sure, that would be great. I'm never going  
18 to ask you to display two pages again, Mr. Lunn.  
19 You're doing it, but I'm being lost.  
20 Q Now, sir, do you see the paragraph starting  
21 "During *Heterosigma* blooms"?  
22 A Yes.  
23 Q Could you take a moment to read that and tell me  
24 if you agree with it.  
25 A Yes, I agree with it.  
26 MR. BLAIR: Could this document be marked the next  
27 exhibit.  
28 THE REGISTRAR: Exhibit 1368.  
29 MS. BAKER: Mr. Commissioner, this is a -- just by way  
30 of process, these documents that we're looking at  
31 right now is one that's been submitted to the  
32 Commission on the website, so it has a Commission  
33 document number already, and it is in evidence  
34 through the public submission process. But so it  
35 -- so we haven't been marking them as exhibits if  
36 they're public submissions. We've just been  
37 identifying them as the public submissions. So I  
38 don't know if you want to -- our rules do state  
39 that the Commissioner can rely on any public  
40 submission in your -- in our findings, so we have  
41 to date not been actually marking these public  
42 submissions as exhibits, it's of course up to you,  
43 what you choose to do.  
44 THE COMMISSIONER: I would prefer that this be marked  
45 as an exhibit, Ms. Baker.  
46 MR. BLAIR: Thank you. Number, please.  
47 THE REGISTRAR: That was 1368.

30  
Jack Rensel  
Cross-exam by Mr. Leadem (CONSERV)

1 EXHIBIT 1368: Submission to the Cohen  
2 Commission, 0358-Haigh, Harmful Algae  
3 Monitoring Program, November 2010  
4

5 MR. BLAIR: Thank you. I think I'm out of time. There  
6 are a few references in that document but now it's  
7 marked an exhibit, I'm not going to proceed.  
8 Thank you.

9 MS. BAKER: We could take the morning break, if you'd  
10 like, and then Mr. Leadem will follow.

11 THE COMMISSIONER: Thank you very much.

12 THE REGISTRAR: The hearing will now recess for 15  
13 minutes.  
14

15 (PROCEEDINGS ADJOURNED FOR MORNING RECESS)  
16 (PROCEEDINGS RECONVENED)  
17

18 THE COMMISSIONER: Mr. Leadem.

19 MR. LEADEM: Thank you, Mr. Commissioner. Leadem,  
20 initial T., for the record, appearing as counsel  
21 for the Conservation Coalition.  
22

23 CROSS-EXAMINATION BY MR. LEADEM:  
24

25 Q Good morning, Dr. Rensel, and thank you for a very  
26 interesting topic and an interesting paper.

27 A Good morning. Thank you.

28 Q I want to begin by looking with you at an email  
29 that you sent to Dick Beamish. If I could have  
30 Conservation Coalition document number 7, please,  
31 and scroll right to the bottom when you get it,  
32 Mr. Lunn. This is some time ago. This is in  
33 August of 2009, but you recollect that you  
34 contacted Dr. Beamish around that time, about the  
35 work that that you were doing with respect to  
36 *Heterosigma*; is that correct?

37 A Yes, that's correct.

38 Q And is that the first contact that you had with  
39 anyone from DFO about the work that you had been  
40 doing and the possible correlation between what  
41 you were finding with the harmful algal blooms and  
42 the decline in the Fraser River sockeye?

43 A Could I see the date on this again, please.

44 Q It's August 14, 2009.

45 A 2009. I may have given a talk or two at the PICES  
46 meetings about the topic, I can't be sure, and DFO  
47 is well represented at those meetings.

August 17, 2011

1 Q Right. Are you somewhat surprised, and I realize  
2 that word is maybe loaded a little bit, but DFO  
3 does not appear to be doing any work on harmful  
4 algal blooms currently, and it, as I understand  
5 it, it has done work on harmful algal blooms in  
6 the past. Do I have that correct?

7 A Perhaps I'm disappointed, but I'm not surprised.  
8 All agencies in North America seem like they have  
9 limited funds these days.

10 Q But it strikes me that with the topic which is  
11 very timely, such as the one that you've  
12 uncovered, and particularly with reference to the  
13 possible correlation between the decline of Fraser  
14 River sockeye, that it's something that ought to  
15 be researched here in Canada, presumably by DFO or  
16 some other institution. Do I have that correct?

17 A That's my opinion, and my colleagues' that are  
18 involved in the PSC from the U.S., I think, too.

19 MR. LEADEM: Could we have that marked as the next  
20 exhibit, please.

21 THE REGISTRAR: That will be Exhibit number 1369.

22  
23 EXHIBIT 1369: Email thread between J.  
24 Rensel, R. Beamish, L. Richards et al re FRS  
25 Mortality, Alternative Contributing Factors,  
26 ending August 14, 2009  
27

28 MR. LEADEM:

29 Q I next want to take you to your report, which is  
30 Exhibit 1359, and this is more for my edification.  
31 If I can look at Table 5 with you, because I'm not  
32 too -- and maybe you can explain some things on  
33 Table 5 to me.

34 A On page 106.

35 Q Thank you. If we look down, for example, at the  
36 2008 data, and you've got it divided into columns  
37 here. The "South Strait of Georgia bloom  
38 occurrence or timing", and there's some numbers  
39 there. For example, under 2007 it's "4-6" and  
40 then "11-13". What do those correspond to?

41 A To the week of the period, I think it elucidates  
42 what it is in the table legend. May 1 begins as  
43 week 1 and then it goes on.

44 Q I see. Okay. So those are sequential weeks  
45 beginning in your calendar year, which would begin  
46 May 1 of that particular year.

47 A That's correct.

- 1 Q All right. The reference to data source of HAMP,  
2 H-A-M-P, that would be the Harmful Algal  
3 Monitoring Program, that's operated by Nicky Haigh  
4 in Nanaimo; is that correct?
- 5 A That's correct.
- 6 Q And that program, as I understand it, is sponsored  
7 or funded in part by the aquaculture industry in  
8 British Columbia; is that right?
- 9 A I think it's funded entirely by them.
- 10 Q I'm going to now -- and I thank you for pointing  
11 out what those numbers meant. I can now  
12 understand that table a little bit more clearly.  
13 I'm going to move from that table, and I hate to  
14 be jumping around so much with you, Dr. Rensel,  
15 but time is very precious in this, and I want to  
16 move on to a different topic. And that's the  
17 topic, and I think you've already expressed this,  
18 that there are many factors that could potentially  
19 trigger or bring into being a harmful algal bloom.  
20 There are factors that you discuss, such as sea  
21 surface temperature, salinity factors, water flow  
22 that's in from the Fraser, and the particular  
23 example of the south Strait of Georgia. But one  
24 of the other factors that I would put to you that  
25 we might be able to control is anthropogenic  
26 nutrient loading; is that right?
- 27 A It's true that these anthropogenic nutrients  
28 discharge into marine waters can be controlled.
- 29 Q Right. And that would be a factor that could  
30 potentially trigger a harmful algal bloom, whether  
31 its *Heterosigma* or *Cochlodinium* or one of the  
32 other species; is that fair?
- 33 A In -- yes, in a nutrient-sensitive area as I've  
34 defined.
- 35 Q Right. And the nutrient-sensitive area as you  
36 defined, it's for that reason that the siting of  
37 aquaculture farms is very critical, because you  
38 would not want to site them in a nutrient  
39 deficient area, because you might in turn sponsor  
40 or trigger a harmful algal bloom, amongst other  
41 things; is that fair?
- 42 A Not entirely, because actually society-wise, we  
43 actually introduce nutrients on purpose to some  
44 aquatic water bodies to enhance productivity.
- 45 Q Yes.
- 46 A For example, in Arrow Lakes and in other lakes in  
47 British Columbia, for sockeye and trout

1 production, rather.

2 Q And that would be in the freshwater environment?

3 A That's right.

4 Q All right.

5 A But it's also done experimentally in the ocean  
6 where iron is added, or nitrogen and iron, to  
7 foster and to study the effects of carbon  
8 sequestration of carbon from the atmosphere, so  
9 that the -- we have to be careful not to say that  
10 all nutrients are bad. Nutrients are the base of  
11 the underlying -- one of the underlying factors  
12 for the food web, and without them we have  
13 impoverished seas.

14 Q Right. And I take your point. But I want to move  
15 it a little step further and specifically  
16 reference nitrogen and phosphorous loading from  
17 anthropogenic sources such as we know, for example  
18 from other testimony, and you may not be aware of  
19 this because of your work south of the border, but  
20 that there is a large sewage outfall from Iona  
21 plant that goes right into the Strait of Georgia,  
22 and obviously you're going to get some nutrient  
23 loading of nitrogen and phosphorous from such a  
24 source. And is it those kinds of anthropogenic  
25 triggers or potentially anthropogenic triggers  
26 that we should be careful about in terms of  
27 harmful algal blooms?

28 A Yes, but I have to qualify and say that it may  
29 well be that the -- in its present case with  
30 *Heterosigma* with the ability to swim at one metre  
31 per hour up and down in the water column, that  
32 they have an unlimited supply of nitrogen by  
33 simply going to the deep layer. And in other  
34 countries where this has been studied that's shown  
35 to be the case. We don't know what goes on in the  
36 Strait of Georgia in terms of vertical migration.  
37 And it also may be an advantage to have a  
38 discharge that is buoyant, that even though you  
39 put the discharge out at depth, it can rise to the  
40 surface with the freshwater, and then the alga can  
41 spend less energy migrating and more energy  
42 dividing and growing.

43 Q And proliferating.

44 A Yes.

45 Q And blooming. Do I have it then that we -- if we  
46 can control to some extent anthropogenic culturing  
47 of harmful algal blooms, that we should do so,

- 1           that we should look, examine that, and try to  
2           limit to the extent that we can, the anthropogenic  
3           effect of -- upon these harmful algal blooms?  
4        A    If indeed it was shown that the -- the *Heterosigma*  
5           is taking advantage of it, it does bring out the  
6           concept of tertiary treatment for discharge of  
7           nitrogen and phosphorous. But phosphorous is  
8           largely removed with the solids already in  
9           secondary treatment, but tertiary treatment, which  
10          is practised in parts of Puget Sound that are  
11          nutrient sensitive, such as Olympia, the Budd  
12          Inlet, is expensive and -- but it can be done.  
13        Q    I just wanted to reference one of the papers that  
14           I'd like to put to you, and it's an article, it's  
15           a document, our document number 2, Mr. Lunn. Are  
16           you familiar with this journal article, "Harmful  
17           algal blooms: causes, impacts and detection",  
18           that's written by Kevin Sellner and others?  
19        A    I know all these people, and Kevin's a good friend  
20           of mine, but I haven't read this for years, so I'm  
21           sorry, I'm not -- I'm sure I read it when it came  
22           out.  
23        Q    All right. Well, I'm going to take you to a  
24           certain passage in this article and see if you  
25           agree or disagree with the authors. If I can ask  
26           Mr. Lunn to pull up page 3 of that particular  
27           article. The very last paragraph on that page  
28           begins with the sentence:  
29  
30                    There is increasing discussion on the  
31                    potential role of aquaculture and mariculture  
32                    in HAB development.  
33  
34           And then it goes on to describe:  
35  
36                    Cultured shellfish and finfish populations  
37                    produce huge amounts of feces, pseudofeces,  
38                    and other excretory products right in  
39                    [nitrogen] and [phosphorous] important to  
40                    algal growth.  
41  
42           If I could just ask you to read the rest of that  
43           and once you've finished, at the end of the page,  
44           I'll ask Mr. Lunn to turn the page for us  
45           electronically so you can finish the sentence.  
46        A    Yes, could you turn the page, I guess.  
47        Q    I don't need to know about Spanish rias. Perhaps

1           you can stop when you reach the sentence saying  
2           however, or "Several HABS in Spanish rias".

3       A     Okay. I've read what Kevin and colleagues wrote  
4           there.

5       Q     Can I ask you if you are in substantial agreement  
6           with what is written there.

7       A     Could I scroll back up to the first part again.

8           It's true that algae don't differentiate a  
9           source of nitrogen or phosphorous, depending on  
10          this, whether it's in the case of nitrogen, urea  
11          ammonia or nitrate, they don't differentiate  
12          except for what their physiological requirements  
13          are. So that you can, and you indeed when you  
14          discharge nitrogen or phosphorous into any aquatic  
15          water body, you can't say that the nitrogen and  
16          phosphorous won't be incorporated in beneficial or  
17          harmful algae.

18          I think Kevin's parenthetical statement about  
19          "30% of the added fish food is harvested as fish  
20          biomass", is misleading because it implies that 70  
21          percent goes to the bottom, and so forth, and I  
22          don't think he had it right there. The numbers  
23          are off quite a bit.

24       Q     Okay. But other than that qualification, you  
25           would basically agree with what's written there?

26       A     Yeah. Yes, I would.

27       MR. LEADEM: Could we have this marked as the next  
28           exhibit, please.

29       THE REGISTRAR: Exhibit number 1370.

30

31           EXHIBIT 1370: Sellner et al, Harmful algal  
32           blooms: causes, impacts and detection, July  
33           30, 2003

34

35       MR. LEADEM:

36       Q     Now, my last set of questions to you will be on  
37           the topic of how *Heterosigma* can potentially  
38           interact with the disease factor to cause  
39           lethality in Fraser River sockeye. And I'll start  
40           off with the general proposition and maybe work  
41           down from there. Would you agree with me that  
42           it's potentially -- that there's a potential  
43           amplification of the effect of *Heterosigma* upon  
44           the gill tissue that you've observed, with  
45           bacterial infection of some sort, so that that in  
46           other words, if you have both of them acting upon  
47           the gill membrane of a fish, that you're likely to

Jack Rensel

Cross-exam by Mr. Leadem (CONSERV)

Cross-exam by Mr. Rosenbloom (GILLFSC)

1 see a synergistic or even a lethal effect occur?

2 A I agree that cumulative effects of harmful algae  
3 and other disease -- and diseases do occur and  
4 have been shown and demonstrated in the literature  
5 and that the example you just talked about, a  
6 bacteria often of a harmful algae could compromise  
7 the gills' surface, the epithelium layer, which is  
8 very thin, one cell thick, and then the fish is  
9 exposed to pathogens that are common in the  
10 environment that normally are excluded by the  
11 healthy gill tissue. So, yes, it's not uncommon.  
12 I talked about that in the paper.

13 Q Yes, and I understand you did talk about that. If  
14 it's demonstrated sometime during these hearings  
15 that there's evidence of a disease, or a disease-  
16 like factor, whether it's a retrovirus or a  
17 bacteria, that may be contributing to the  
18 mortality of the Fraser River sockeye, do you see  
19 that the combination of a one-two punch, as you  
20 called it, of a harmful algal bacterial bloom and  
21 a disease would potentially bring about an acute  
22 lethality in the large population of the Fraser  
23 River sockeye. Could it be that what we're  
24 looking at is contributing, are contributing  
25 factors here.

26 A Well, yes, I think I stated earlier that I would  
27 be looking for a combination of factors, not a  
28 single factor.

29 Q Right. And so in isolation the harmful algal  
30 blooms may not be the factor behind the decline of  
31 the 2009 sockeye return to the Fraser River, but  
32 it's certainly in your mind one of the factors  
33 that has caused that decline, is that fair to say?

34 A That's fair to say.

35 MR. LEADEM: All right, thank you, those are my  
36 questions.

37 MS. BAKER: Thank you. Mr. Rosenbloom is next.

38  
39 CROSS-EXAMINATION BY MR. ROSENBLOOM:

40  
41 Q Dr. Rensel, my name is Don Rosenbloom. I appear  
42 for Area D gillnet, Area B seiner, two of the gear  
43 types obviously fishing commercially on the B.C.  
44 coast. I find your evidence, Dr. Rensel, both  
45 intriguing and sobering. I have a few questions  
46 for you in terms of the opinions you hold, and  
47 whether -- and your attitude about how the

1 Canadian government and the Department of  
2 Fisheries is handling the opinions and theories  
3 that you have been advancing over some time.

4 To lead into that, I wish to refer you to two  
5 emails that are not in evidence as of yet, but  
6 because these are emails of which you are not a  
7 signatory, or even a participant, I will invite  
8 these two documents to go into evidence as  
9 identification, and then when the authors of these  
10 emails come forward, I will be cross-examining on  
11 them. I'm referring, Mr. Lunn, to email Canada  
12 354074, which found both in our exhibit, intended  
13 exhibit list, but also on Exhibit document 6 of  
14 the Conservation Coalition's list of documents.  
15 And just before inviting your comment, and I'll  
16 direct you directly to the passage, Mr. Lunn, if  
17 you would also have available a second one, which  
18 is Canada 096611, which is on our document list  
19 and also the Commission's number 4 in the  
20 Commission's list of exhibits. Thank you.

21 Having those two documents and dealing with  
22 the first of those, which is at the top an email  
23 from a Robin Brown, who will be testifying here,  
24 to a group of individuals, he says in part in  
25 2006, and I read:

26  
27 The last messaging I have received on this  
28 from the NSSDC is that toxic algal blooms are  
29 NOT A PRIORITY ISSUE for DFO Science. With  
30 fewer staff and smaller budgets, we must  
31 avoid the temptation to "dabble" in fields  
32 that are considered to be low priority and  
33 for which we really don't have the resources.  
34

35 Now, that's a statement from Robin Brown, Manager,  
36 Ocean Sciences Division, back in 2006.

37 I then lead you to the second document I made  
38 reference to. Again Mr. Lunn will put it up.  
39 Again from Robin Brown. This dated in 2009, an  
40 email to an Edward Black. He says:

41  
42 Ed: Jack Rensel has developed the material  
43 he presented at PICES. Could you look over  
44 this ms and let me know what you think? I  
45 realize that toxic algae is a banned 9 (sic)  
46 or at least unpopular) topic in DFO, but this  
47 will get some airing in the upcoming inquiry.

1

2

I presume that's our inquiry.

3

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Now, Doctor, seeing those two references from somebody high up in authority in respect to DFO, can you tell me your reaction to that. Do you believe indeed DFO is missing the boat in respect to a critical issue relating to obviously the health of the sockeye run in the Fraser?

9

A

I'd have to say that in 2006 when the first email was written that I probably would have agreed that with the decision not to be involved as much as they had previously. I know Robin Brown and I've talked to him about this a number of times, and I don't see anything here that if Robin has been deeply involved in the PICES meetings and he's been involved in our Harmful Algal Bloom meetings since then. So I think that everyone's awareness of the problem has increased since we published our paper and I've been talking about it, and people are considering it now.

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Q

What about the 2009 communication, what do you take from a Department of Fisheries, that from at least an official of the Department of Fisheries who speaks about this topic being banned within DFO.

22

23

24

25

26

A

I can't speak for them. I don't know what he means by that.

27

28

Q

It disappoints you, doesn't it?

29

A

Well, it does disappoint me, and I asked Laura Richards after I gave my presentation in Nanaimo if they were interested in following up, and she simply told me that they had decided previously not to be involved in harmful algae, and she wouldn't elaborate and didn't -- I'm sorry, she didn't elaborate.

30

31

32

33

34

35

Q

And when was that conversation, approximately?

36

A

That was in June of 2010.

37

Q

Thank you. Now, you being an American and doing work also in the United States, has the American Fisheries officials, both federal and state, been more receptive to appreciating the significance of the findings you have been publishing in respect to correlation of the algae blooms and the decline of stock?

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A

No one's been showering research money on me or my

45

46

47

colleagues, although we do have a nice grant and that probably helped through this work for NOAA,

- 1 actually got a grant from NOAA to do work on the  
2 actual mechanisms of mortality of *Heterosigma* on  
3 salmon. And there are three research groups in  
4 our state, academic and government, that are  
5 continuously working on *Heterosigma* issues. So  
6 that there is a higher -- presently a higher level  
7 of interest. I also note that on the East Coast,  
8 I work a fair amount with people in DFO in New  
9 Brunswick, and there is a fair amount of work with  
10 harmful algae there, and at least one person  
11 that's considered an expert there that does that  
12 sort of thing.
- 13 Q And when you speak of New Brunswick, are you aware  
14 whether DFO is funding research on the East Coast  
15 of Canada in respect to these issues?
- 16 A Not presently. They have in the recent years,  
17 though, I can't speak on...
- 18 Q Yes. And internationally, outside of Canada and  
19 the U.S., you've spoken about your involvement  
20 with scientists in Asia and so on and so forth.  
21 Is there a greater cognizance or appreciation or  
22 sensitivity to these issues?
- 23 A Usually a society reacts after a major event and  
24 gets very interested in it. And particularly if  
25 people die, which is not uncommon, of course, with  
26 some of the blooms, and through shellfish  
27 contamination.
- 28 Q Yes.
- 29 A So when I first started in the field, the  
30 international meetings would have a few people, a  
31 few, maybe a few hundred, and now there's  
32 literally thousands that come. So it is a growing  
33 field, unfortunately, it does reflect the times.
- 34 Q It's very regrettable, is it not, Doctor, that  
35 since 2006 or 2004 DFO has not been funding  
36 research in respect to this matter on our West  
37 Coast?
- 38 A Well, again, to be fair to DFO, they -- I don't  
39 think anyone was thinking along these lines in  
40 2006, '07, '08, or maybe even '09.
- 41 Q All right. But they are thinking on these lines  
42 currently, aren't they, to a certain extent?
- 43 A As part of the evidence I asked for some emails  
44 that were of record, and I have read through them,  
45 and I see that other people are definitely  
46 discussing it, physical oceanographers, biological  
47 oceanographers, everyone is.

40  
Jack Rensel  
Cross-exam by Mr. Rosenbloom (GILLFSC)

1 Q And let me drill directly on that point and I wish  
2 to put before you, sir, document number 20 on the  
3 Commission list, which is a briefing document from  
4 our Regional Director General of DFO here in B.C.,  
5 Pacific Region. Have we got that?

6 MR. LUNN: I'm just pulling it up now.

7 MR. ROSENBLOOM: I apologize, just one second. The two  
8 exhibits that I had referred to that I wished to  
9 have marked for identification, could those first  
10 be marked. Thank you.

11 THE REGISTRAR: Which one...

12 MR. ROSENBERGER: I am speaking of document Canada  
13 354074, and 096611, and they were up on the screen  
14 a moment ago and the witness was speaking to those  
15 two documents.

16 THE REGISTRAR: The first one will be marked for  
17 identification "KK", and the second will be "LL".

18

19 KK FOR IDENTIFICATION: Email thread from  
20 Robin Brown to Jim Gower and others, August  
21 8, 2006, CAN354074

22

23 LL FOR IDENTIFICATION: Email thread from  
24 Robin Brown to Edward Black, December 15,  
25 2009, CAN096611

26

27 MR. ROSENBLOOM:

28 Q Thank you. Now, I was about to refer you to what  
29 is document 20 in the Commission's list, which is  
30 a briefing document to the Deputy Minister, Claire  
31 Dansereau from our Regional Director General  
32 Farlinger here in British Columbia. Do you have  
33 that in front of you now? If you would turn to  
34 page 3 -- excuse me, actually page 40 of that  
35 briefing document. And this is a document dated  
36 June the 16th of this year, 2011, so very recent.  
37 I want to ask you, Doctor, whether you agree with  
38 the author's briefing to the Deputy Minister where  
39 at the bullet, the top third of the page:

40

41 • Based on the most recent analyses, the  
42 following factors most likely led to sockeye  
43 mortality at the scale observed in 2009:

44

45 And I take you down to the four theories, the four  
46 factors, of which the fourth is:

47

1 Toxic algal blooms in the Strait of Georgia.

2

3

It then reads:

4

5

Although data are limited, additional analyses by a US researcher support the presence of extensive blooms of toxic algae in the Strait of Georgia in 2007 when juvenile sockeye were present.

6

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Can I assume obviously you endorse that paragraph and placing your topic or that factor under the category of most likely having led to the decline in 2009?

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A Could you scroll up again to the top of the four.

15

16

Based on the most recent analyses, the following factors most likely led...

17

18

19

So we're talking about any one or all these factors combined.

20

21

Q Yes.

22

A Yes.

23

Q And you would agree with that.

24

A Right. I thought the evidence actually in 2007 was very strong and not limited, in comparison to the other sources of data.

25

26

27

Q Right. And when they refer to a U.S. scientist, I presume that's likely you.

28

29

A Perhaps.

30

Q Perhaps. Now, Doctor, accepting, endorsing what is here in a briefing note to the Deputy Minister, what do you believe the Deputy Minister should be directing DFO to initiate in the way of programs at this moment in light of this briefing note, other than what you've already spoken about, about further monitoring and so on. What else would you suggest?

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A Well, there needs to be a core individual or group of individuals who focus on harmful algae on behalf of the wild fish, and that could be incorporated into the shellfish research, too, because that's, as you may know, you have a new species of shellfish toxin producing algae, *Prorocentrum* and that sickened 50 people a couple of weeks ago, and we don't really have anybody tracking those things specifically. And the

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1 Department of Fisheries and Oceans have many  
2 talented and excellent biological and physical  
3 oceanographers and there's no shortage of people  
4 to do this work, but they're not doing it  
5 presently.

6 Q Money's an issue.

7 A Apparently. I can't speak for DFO, of course.

8 MR. ROSENBLOOM: I appreciate that. I wonder if this  
9 document, the briefing note, could be marked as an  
10 exhibit, please.

11 THE REGISTRAR: Exhibit 1371.

12

13 EXHIBIT 1371: Briefing Memo for the Minister  
14 re Update on Factors Affecting the 2009  
15 Fraser River Sockeye Return (For  
16 information), June 16, 2011

17

18 MR. ROSENBLOOM:

19 Q You spoke in response to Mr. Blair in his  
20 examination or cross-examination of you about the  
21 fact, and please correct me if I misstate your  
22 evidence, that with the U.S. fish farms, that they  
23 are strategically located in non-nutrient  
24 sensitive areas of the state. Do I have your  
25 evidence correctly?

26 A That's correct. You can't get a -- you can't get  
27 a lease without doing that.

28 Q Okay. Could I ask you whether that also applies  
29 as a strategy in British Columbia in terms of the  
30 placement of the fish farms here?

31 A I don't have any direct knowledge of all the  
32 different 80-some fish farms in British Columbia,  
33 so I can't speak to that. But I can speak to the  
34 important point that the worst place for  
35 *Heterosigma* by far, and it was shown in our paper,  
36 and that's not speculation, it's true, that the  
37 south Strait of Georgia is the problem area  
38 primarily, apparently, and there are no commercial  
39 fish farms there, of course.

40 Q Yes. The last area that I wish to cover with you  
41 relates to what remedial steps government should  
42 take in respect to algae bloom growth within the  
43 state's waters, within the country's waters. I  
44 have read some of the material for this section of  
45 our examination, but I see nothing, Doctor, in  
46 respect to what remedial opportunities are there,  
47 what remedial steps should be taken by government

1 to remove algae blooms. There was some exchange  
2 between you and Mr. Leadem about what are the  
3 causes of the growth, but I want to ask you is  
4 there dredging equipment that is available? is  
5 there some sort of procedure that can at least  
6 mitigate the dangers that you speak about in your  
7 evidence?

8 A It's a topic that is of high interest that I'm  
9 involved in internationally, the mitigation of  
10 harmful algal blooms, which include prevention of  
11 them, foremost. But after you have them, how --  
12 what kind of a treatment can you apply. The  
13 Chinese, the Koreans, other countries are making  
14 rapid advances on this. There's actually small  
15 amounts of naturally occurring clays that are  
16 mixed in a slurry can be spread on the water, very  
17 small amounts, don't think in terms of dump trucks  
18 loads per cubic metre, but small amounts spread  
19 discretely, can flocculate blooms out of the  
20 water, kill the blooms. And in the case of  
21 *Heterosigma*, I published a paper on it and I  
22 pointed out that since there is no persistent  
23 toxin that we know about, that you're not  
24 transferring the problem from the water column to  
25 the benthos, to the bottom, you're simply removing  
26 it from the water column.

27 So I may have talked about it in the paper, I  
28 forget, if you had a strategy were you knew, for  
29 example, English Bay is a source for the South  
30 Strait of Georgia, there may be many sources or  
31 not, we don't know. But you -- if I'm monitoring  
32 the weather conditions and the time of year, you  
33 could treat with small amounts of clay and remove  
34 much of the bloom. And the Koreans have done this  
35 on a very large scale.

36 Q Successfully?

37 A Successfully, yes, and their priority, however, is  
38 farm fish over wild fish, and I think everyone  
39 would agree that it's -- the farm fish -- farms  
40 can be moved, farm fish are important, too, so  
41 apparently to the economy and to -- for a good  
42 food source for people. But, you know, we're  
43 interested in North America especially in  
44 protecting the wild fish.

45 Q Are you aware whether DFO is even knowledgeable  
46 about this -- these advances by the Asians in  
47 respect to the removal of the blooms, and if you

- 1 do, and whether you know of their attitude in  
2 respect to it if they do know about it.
- 3 A Actually, the best scientific work was done by my  
4 colleagues at Wood Hole Oceanographic Institution.  
5 The Asians are simply applying it in large scale,  
6 and so that there is a lot of interest in North  
7 America and I'm sure that the Jennifer Martin, who  
8 is the DFO harmful algal blooms scientist in New  
9 Brunswick, is well aware of these. I've been on  
10 panels with her and written papers with her  
11 before, and I'm sure she's aware of it. But again  
12 don't know of an individual in British Columbia  
13 who is considered the harmful algal blooms  
14 scientist for DFO.
- 15 Q If some of this technology has already proven  
16 successful, for example, in Korea, do you  
17 recommend that the Canadian government move  
18 quickly to investigate and to apply this  
19 technology in Canada?
- 20 A Well, I would recommend that it be investigated,  
21 but we have to learn more about the spatial and  
22 temporal occurrence of the algae and where are the  
23 cyst beds, are they, you know, is this a thing  
24 that if you don't treat one area, and you have  
25 many other areas, maybe it's not possible to nip  
26 it in the bud.
- 27 Q Yes.
- 28 A So there is a lot left to be learned.
- 29 Q Back to the shortage of data.
- 30 A You couldn't treat the Strait of Georgia with  
31 clay. It would require mountains of clay.
- 32 Q And in any event, there is a shortage of data here  
33 in B.C. in terms of taking it to the next step.
- 34 A Yes.
- 35 MR. ROSENBLOOM: Thank you. No further questions.
- 36 MS. GAERTNER: Good morning, Mr. Commissioner, it's  
37 Brenda Gaertner and with me Crystal Reeves, for  
38 the First Nations Coalition. Just as a short  
39 aside, I was observing in this late August that  
40 we're not -- we're still at the mouth, but I  
41 understand we're at the beginning of the final  
42 push, so we must be coming up the river soon and  
43 returning to the spawning grounds, the end of this  
44 inquiry. And here we are in the marine.  
45  
46  
47

1 CROSS-EXAMINATION BY MS. GAERTNER:  
2

3 Q I spoke briefly with you about the clients that I  
4 represent, Doctor, and I just have a few  
5 questions. My clients are interested in making  
6 sure that as much information about all of these  
7 understandings, if we're going to call them that,  
8 are available to be used and I want to ask you  
9 more about the data and some of the data  
10 collection that you did with respect to this, and  
11 also the location of what you found, based on the  
12 data that you found. It seems to me you did  
13 mention that the Strait of Georgia is of some  
14 concern, but my reading of this document has it  
15 that the *Heterosigma* blooms are located much  
16 north, further north than that, and so that there  
17 is a potential that that could continue to be a  
18 problem as we go further north. And then just  
19 briefly a couple of questions about precautionary  
20 approaches.

21 And so let's start with data. As I  
22 understand this, and it became clearer in Mr.  
23 Leadem's evidence, that the data that you relied  
24 on included any data that was useful to you when  
25 DFO was still doing this work in 1999 to 2004, but  
26 also the work that the aquaculture industry has  
27 been responsible for gathering from 2004 forward.  
28 Is that correct, you had access to all that data?

29 A Well, let's be precise, please, because --

30 Q Yes, please.

31 A -- they actually just collect samples, and the  
32 independent scientist Nicky Haigh, who is the  
33 contractor for them, does the analysis. And also  
34 I'd like to clarify, we had no data collection,  
35 any sample sources from the central and northern  
36 Strait of Georgia, and Dick Beamish was confused  
37 about that. So we don't actually know what was  
38 going on during these years in those areas. We do  
39 know about the south Strait of Georgia and we know  
40 about the water conditions because those waters  
41 are moved south with the estuarine flow, right  
42 into north Puget Sound, where they do cause  
43 problems in fish farms and where we respond to it  
44 with measuring and monitoring.

45 Q And as all of these places are along the migratory  
46 route of Fraser River sockeye salmon, or many of  
47 them are, there is of course a concern that as the

1 weather changes, or all the variables that occur,  
2 these blooms could begin to expand into other  
3 areas, correct?  
4 A Yes.  
5 Q Yes. So the information that you received from  
6 Nicky Haigh for your article and for this work is  
7 the information the aquaculture industry has been  
8 collecting and providing to her; is that correct?  
9 A No.  
10 Q No?  
11 A Again, they collect samples. That's not  
12 information.  
13 Q All right.  
14 A They take the samples, they don't know what's in  
15 them. They -- as far as I know, because I have  
16 not worked for or communicated with them directly  
17 in British Columbia. But if it's like Washington  
18 State, in Washington State, actually, the fish  
19 farmers do their own analysis on site, and look  
20 for the harmful algae. But in this case, I  
21 suspect that some do and some don't. At least  
22 these samples are preserved and sent to Nicky, she  
23 does the counts, and then that's where we started  
24 comparing her data with my data, and seeing the  
25 correlations between them.  
26 Q And that was stepping off information that you  
27 used for the conclusions you've made as it relates  
28 to recent algae blooms in B.C. waters or Salish  
29 Sea?  
30 A We haven't made any hard and fast conclusions, but  
31 this is a hypothesis and it's still just  
32 correlation, so but it's a good one.  
33 Q How is it that you got access to this data? From  
34 my understanding of the PPR that was filed, and I  
35 can take you to paragraph 178 of PPR19, if I may.  
36 This is propriety data of the aquaculture  
37 industry, and so I'm just wondering, you know, is  
38 it -- can anybody get the access to the  
39 information that Nicky's collecting, or is it just  
40 by permission? What protocols did you use? What  
41 was necessary to get access to this information?  
42 A The protocols are discussed in the paper as far as  
43 the sampling and --  
44 Q Sorry, I missed that, what...  
45 A The methods cover how the sampling was done and to  
46 some extent. I can't speak for Ms. Haigh about  
47 whether or not you can have the raw data.

1 Q But you've got the data.

2 A Yes, I have the data, and I -- first I took her  
3 summaries and when I saw that there were strong  
4 correlations, I actually asked for the individual  
5 data. And some of them belong -- well, the south  
6 Strait of Georgia data she collected on her own.  
7 She used to be a DFO employee who worked at the  
8 Pacific Biological Station. She was used to going  
9 down and collecting data in those areas, and she's  
10 -- in many years she did, and I asked her, well,  
11 why did you miss a few years, and those could have  
12 been key years. And she just said, well, we were  
13 busy in certain years and there was no -- no hint  
14 that there would be a wild fish connection here,  
15 so there was no necessity.

16 Since we've been doing this, she's still out  
17 there collecting in the south Strait of Georgia at  
18 her own volition.

19 Q Would it be an accurate next step to say that if  
20 data was being collected, not only with fish farms  
21 in mind, but fish farms and the migratory route of  
22 Fraser River sockeye, or other salmon species,  
23 that we might have more concerns about the  
24 location of these blooms in other places within  
25 the coast.

26 A Could you restate that question, I'm...

27 Q Your data, as I understand it, relies on the data  
28 that Ms. Haigh collected, and your -- this article  
29 that you have in front -- that we have in front of  
30 you, Exhibit 1359, which is the summary of the  
31 most state of your thinking, as I understand it,  
32 in addition to the affidavit that we have, around  
33 the location of the blooms in the -- in the Salish  
34 Sea and otherwise.

35 A Okay. If I can address that. If you look in  
36 Table 5 under my -- our publication, there's a  
37 number of data sources, including DFO,  
38 publications before in 1990s, and the information  
39 that I've published and collected in north Puget  
40 Sound. So it's not solely limited to the HAMP  
41 algal bloom monitoring program.

42 Q But the most recent stuff is.

43 A No, we are also still looking at fish mortality in  
44 north Puget Sound. That's a key component. If  
45 you have dying fish, both wild and farmed fish,  
46 that's the forensic evidence you need to say  
47 something's going on. And the HAMP data doesn't

- 1 tell me that there were dying fish at some point.  
2 It just tells me that there were cell counts of  
3 certain -- certain species.
- 4 Q Right. And if I then go to page - sorry, I'm  
5 jumping around this document - in Exhibit 1359, at  
6 section 7, which is on page 103 of the actual  
7 document, you're summarizing where the bloom in  
8 the sampled regions in British Columbia waters was  
9 located, the bottom of the page under the first  
10 paragraph 7.1, and the level of occurrence. And  
11 it's actually located in all of the areas that  
12 that -- in which the samples were taken, correct?
- 13 A That's right.
- 14 Q So it is located in all the regions that are  
15 summarized, and over the page in Table 3, you have  
16 Regions A through D have the bloom located  
17 throughout all of the areas; is that correct?
- 18 A That's correct. And if I may, the bloom is  
19 universally later, except for the year 2007 on --  
20 after the juvenile fish have left the area. So  
21 that's a key consideration. As I said earlier,  
22 this is all about timing.
- 23 Q Yes. And there is a section that you've also  
24 raised concerns around adult returning salmon and  
25 the bloom, correct?
- 26 A That's correct.
- 27 Q And that would be in later times in some  
28 circumstances, correct?
- 29 A And I pointed out that we -- our sampling areas  
30 weren't necessarily as good for adults as they  
31 were for juveniles. The juveniles tend to follow  
32 the shoreline. The adults can swim, and do, right  
33 down the middle of the Strait of Juan de Fuca, for  
34 example, in large schools, and so they're, you  
35 know, we had a correlation but it wasn't -- it was  
36 numerically strong, but not statistically  
37 significant, it was .0, an alpha .07, instead of  
38 the limit is usually set at .05.
- 39 Q Would you agree with me that for those that are  
40 concerned about the impact of this bloom on wild  
41 stock, that it would be useful to continue to have  
42 access to the aquaculture industry's sampling  
43 process?
- 44 A So the question is --
- 45 Q Would it be useful to --
- 46 A -- should you have, should the public at large  
47 have access to it?

1 Q Yes.

2 A I don't know, that's a societal decision in  
3 British Columbia. I would think that more  
4 information is good.

5 Q Is it available in Washington State?

6 A To the extent that I've tried to publish it in  
7 technical reports for NOAA and other people. The  
8 fish farmers in Washington State are rather open  
9 about the blooms and when they occur, and they do  
10 news interviews, and so forth.

11 Q Thank you. So that would be a useful next step in  
12 harmonizing some of this data and getting, moving  
13 forward is to make sure that the data - the  
14 samples that are collected are used by those that  
15 could use that information wisely and the looking  
16 after Fraser River sockeye salmon.

17 A I believe I looked at an exhibit from Ms. Haigh  
18 who has stated -- when she stated that essentially  
19 there should be a broader program to that end  
20 where everyone has access to the data.

21 Q The next question that I had is around this - I  
22 suppose that maybe I'll just say it more directly  
23 - scientists and perhaps lawyers are often  
24 interested in making sure we have causations  
25 firmly determined. Aboriginal people want to make  
26 sure that they can have access to healthy sockeye  
27 salmon for many generations into the future. And  
28 so waiting for causation to be absolutely proven  
29 may be too late. And so we're looking at what  
30 precautionary steps could be taken now in  
31 ecosystem-based management, and I wonder if you  
32 have some suggestions around precautionary steps  
33 that could be taken as it relates to algae bloom  
34 in Pacific Coast waters, in this case, waters  
35 along the migratory route of the Fraser River  
36 salmon.

37 A Well, first of all, I don't think we're talking  
38 about toxicity of the fish to the consumers.  
39 We're talking about the populations, preserving  
40 the populations.

41 Q That's right, because they want to fish in future  
42 generations.

43 A That's right. That's their culture. So I've  
44 tried to identify in the paper a number of  
45 different steps that could be taken. And I've  
46 discussed, starting with the monitoring, but also  
47 more sophisticated forms of monitoring, remote

1 sensing, molecular studies, that where you have  
2 remote buoys that sample these things on a routine  
3 basis. There's a number of tools, and the first,  
4 in order to -- you're asking me if we should move  
5 ahead with mitigation without understanding, and I  
6 think that that might be dangerous.

7 I think we need to as rapidly as possible  
8 understand the extent of the problem, if the fish  
9 are actually -- it should be relatively easy to  
10 locate a bloom and to bring in fish in live cages  
11 and expose them and do that repeatedly in the  
12 lower Strait of Georgia, for example. So it's not  
13 -- once people will understand that farm fish and  
14 wild fish have shared physiology and that one is  
15 being affected and not the other is pretty  
16 unlikely. I think that more progress would  
17 follow.

18 Q Thank you. Just one final question in this is  
19 more around ecosystem approaches to the Strait of  
20 Georgia. If I could go to Exhibit 812, it's at  
21 Tab 6 of our list of documents. And you will  
22 likely not have had a chance to read this, and I'm  
23 just going to take you -- it's a DFO document on  
24 developing a framework for Science support of  
25 ecosystem approaches to the Strait of Georgia.  
26 And I just need to understand, if you go to page 5  
27 of the document, there's a discussion on  
28 "Anthropogenic Stressors", and over -- that's  
29 perfect, actually, thank you.

30 So you see at the bottom is the title is  
31 "Anthropogenic Stressors" and you see on the next  
32 page they discuss two classes of potential  
33 stressors under that, one that they call "natural"  
34 and the other "direct". And natural are defined  
35 to include environmental variability and shorter  
36 to longer time scales, as well as secular  
37 environmental changes, and then there's the direct  
38 anthropogenic stressors. And when I was reviewing  
39 this for the purposes of your evidence, and  
40 looking at the ecosystem-based management  
41 approaches that our clients -- my clients are  
42 pushing for, I wasn't clear how we would classify  
43 and what we would -- where we would place harmful  
44 algae blooms.

45 And so I'm wondering if you could take a  
46 moment to look at that and help us understand when  
47 doing ecosystem-based management in the Strait of

- 1 Georgia and otherwise, how you would classify that  
2 and how you would address it.
- 3 A Could you scroll down, please, to the table.  
4 So the question is, what niche would you put  
5 it in. It's a combination of natural and possibly  
6 anthropogenic and we don't know the mix at this  
7 point. Thank you. So that's about as far as I  
8 could go. And then within the -- within either  
9 category it is a marine ecology issue.
- 10 Q And so the approach to that stressor, whether it  
11 will require both a total system approach and  
12 perhaps a very specific approach once we can  
13 identify clearly whether things like the clay or  
14 the mud could work.
- 15 A You trailed off at the end there, I didn't hear  
16 that (indiscernible - overlapping speakers).
- 17 Q I'm sorry. So the approach that we would use is  
18 both a total systems approach, a total systems  
19 approach looking at it from that point of view,  
20 but also a very specific approach, if the research  
21 provided support for mitigation efforts like you  
22 were suggesting.
- 23 A Yes, I would say that.
- 24 Q Commissioner, I learned just this morning  
25 actually, I regretted to note that Dr. Rensel has  
26 also been a biologist who was actively involved in  
27 implementing the Boldt decision for the tribes in  
28 the States, and so I won't endeavour to ask too  
29 many questions, because I just learnt it. But I  
30 did want to ask you whether you agreed with this  
31 observation, and I have observed the work that was  
32 done in Boldt in the States and otherwise, that it  
33 takes a lot of patience to implement the kinds of  
34 change that the Boldt decision imposed in  
35 Washington State, and that mistakes are made and  
36 errors are made and we need to go forward in order  
37 to balance that negotiating table and the  
38 management decisions around that.
- 39 A You could do a lot of things in a career of 40  
40 years, and that's how I -- my first professional  
41 job was as a tribal biologist, where,  
42 incidentally, the fish were being harmed from our  
43 biology, that we were being -- we had a net pen  
44 program to release coho salmon and one year they  
45 all died, and that's another impetus to my present  
46 career.
- 47 But, yeah, it takes a lot of patience and

1           that's one of the reasons I'm not up in British  
2           Columbia advocating, lobbying, we've produced the  
3           paper and I'm busy elsewhere, and if people want  
4           to follow up, that's great. But I don't lay awake  
5           at night worrying about whether or not DFO is  
6           going to adopt this. It's really the society's  
7           decision up here.

8       MS. GAERTNER: Thank you, those are my questions, Mr  
9           Commissioner.

10       MS. BAKER: Mr. Commissioner, those are all the  
11           questions for Dr. Rensel. I have nothing to re-  
12           examine on.

13  
14       QUESTIONS BY THE COMMISSIONER:

15  
16       Q     Dr. Rensel, you may have addressed it in your  
17           paper, or you may have addressed it this morning  
18           in an answer. I am just trying to get an  
19           understanding. Is there any, you've talked about  
20           far off research in Asia and you've just returned  
21           from an interesting part of the world. But right  
22           here at home, is there any sharing between  
23           governments that you're aware of, that is  
24           Washington State, or federal, U.S. and Canada,  
25           around your specific area of research. In other  
26           words, are you aware of any programs where the  
27           governments have come together, not to look at far  
28           off places, but to look in their own waters off  
29           the West Coast of Canada and the United States  
30           regarding your specific area of research?

31       A     Well, there certainly is for a number of fishery  
32           fields, the salmon management, herring management,  
33           I know friends of mine are involved on both sides  
34           of the border. It's very common there's cross-  
35           border work going on, but as I indicated, I don't  
36           think presently, although DFO has expert  
37           phytoplankton ecologists, there's no one  
38           identified as the harmful algal bloom specialist,  
39           and I don't see people at the national or  
40           international meetings from British Columbia, so  
41           that's what I'm seeing.

42       THE COMMISSIONER: Thank you very much.

43       MS. BAKER: Thank you, Mr. Commissioner, I was hoping  
44           to actually start the other panel before the lunch  
45           break, and I could either ask them to come up and  
46           get their introductions done, or maybe we could  
47           back five minutes early after, at five to 2:00?

53  
PANEL NO. 53  
In chief by Ms. Baker

1 THE COMMISSIONER: Sure, why don't we do that.  
2 MS. BAKER: Do that? Okay. Thank you.  
3 THE COMMISSIONER: Okay.  
4 THE REGISTRAR: The hearing is now adjourned until five  
5 to 2:00.

6  
7 (PROCEEDINGS ADJOURNED FOR NOON RECESS)  
8 (PROCEEDINGS RECONVENED)  
9

10 THE REGISTRAR: The hearing is now resumed.  
11 MS. BAKER: Thank you. Mr. Commissioner, we have a  
12 panel of three, one by way of video conferencing,  
13 that's Mr. Sergio Di Franco, in Ottawa. And in  
14 the room with us today, we have Peter Ross, who  
15 you'll remember, and Bruce Reid. So they'll be  
16 affirmed now.

17 THE REGISTRAR: Yes, Mr. Di Franco, do you hear me?

18 MR. DI FRANCO: Yes, I can.

19  
20 SERGIO DI FRANCO, affirmed.  
21

22 THE REGISTRAR: Would you state your name, please?

23 MR. DI FRANCO: Sergio Di Franco.

24 THE REGISTRAR: Thank you. Yes, and your affirmation  
25 is still in effect.

26 DR. ROSS: Yes.  
27

28 BRUCE REID, affirmed.  
29

30 THE REGISTRAR: Would you state your name, please?

31 MR. REID: Bruce Reid.

32 THE REGISTRAR: All right. Could I ask you to give  
33 your name again?

34 DR. ROSS: My name is Peter Ross.  
35

36 PETER ROSS, recalled.  
37

38 THE REGISTRAR: Great, thank you. Counsel?

39 MS. BAKER: Thank you. Just a reminder to turn the  
40 mike on when you speak.

41 THE REGISTRAR: Oh, sorry.

42 MS. BAKER: I don't know if the recorder caught that,  
43 or not. All right. Thank you.  
44

45 EXAMINATION IN CHIEF BY MS. BAKER:  
46

47 Q I'll begin with you, Mr. Di Franco, to just

August 17, 2011

54  
PANEL NO. 53  
In chief by Ms. Baker

1 identify your CV for the record. So that's in  
2 Tab 1 of the Commission's documents.

3 MR. DI FRANCO: Yes.

4 Q Okay. So you have that there before you and that  
5 is your CV and that identifies you as being the  
6 senior enforcement and prevention officer with DFO  
7 in the Canadian Coast Guard Environmental Response  
8 Unit?

9 MR. DI FRANCO: That's correct.

10 MS. BAKER: Okay. Thank you. I'll have that marked,  
11 please.

12 THE REGISTRAR: It will be marked as Exhibit 1372.

13 MS. BAKER: Thank you.

14

15 EXHIBIT 1372: *Curriculum vitae* of Sergio Di  
16 Franco

17

18 MS. BAKER:

19 Q And Dr. Peter Ross, you've already been a witness  
20 before the Commission and your CV is already  
21 marked as an exhibit, but just for the record,  
22 it's Exhibit 1043. And then Mr. Reid, if I can  
23 ask you to just identify your CV, which is at  
24 Tab 31 of the Commission's documents. Is that  
25 your CV?

26 MR. REID: Yes, that is.

27 Q Okay. And you are currently the regional manager  
28 -- it says on your CV, you're the Regional  
29 Manager, Oceans Programs, Oceans, Habitat and  
30 Enhancement, but I understand that's now called  
31 the Ecosystems Management Branch?

32 MR. REID: That is correct.

33 Q Okay. Thank you. And prior to that, from 2007 to  
34 2009, you were the Regional Manager of Habitat  
35 Protection and Sustainable Development within the  
36 then OHEB branch?

37 MR. REID: That's correct.

38 MS. BAKER: Okay. And could that be marked, please?

39 THE REGISTRAR: That will be exhibit number 1373.

40 MS. BAKER: Thank you.

41

42 EXHIBIT 1373: *Curriculum vitae* of Bruce Reid

43

44 MS. BAKER:

45 Q All right. Now, I'll move to some questions for  
46 Mr. Di Franco. Mr. Di Franco, you're here as a  
47 representative of the Canadian Coast Guard,

1 primarily talking about marine spills. Can you  
2 hear me all right?

3 MR. DI FRANCO: Yeah, I'm having a little bit of  
4 trouble. I've asked, I guess it's John Lunn, to  
5 work on the audio a bit.

6 MS. BAKER: Okay. Just let me know if you can't hear  
7 me.

8 MR. DI FRANCO: That's a bit better.

9 MS. BAKER: Yeah, we can hear you fine so as long as  
10 you can make out what I'm saying, we should be  
11 able to hear you okay.

12 Q Can you describe the Canadian Coast Guard's role  
13 in marine pollution incidents?

14 MR. DI FRANCO: Certainly. The Canadian Coast Guard is  
15 the lead federal agency responsible for ship  
16 source and mystery source pollution incidents in  
17 Canadian waters. Canadian waters being all the  
18 waters out to the exclusive economic zone, so it's  
19 a 200-nautical-mile limit, but also internal  
20 waters, including lakes and rivers. The key point  
21 is the ship source and mystery source pollution  
22 incidents.

23 So as a lead federal agency, we get our  
24 mandate, our legislative mandate mainly from two  
25 Acts of Parliament, the first is the **Canada**  
26 **Shipping Act**, which is Part 8, Section 180,  
27 specifically, and the other Act is the **Oceans Act**,  
28 which our role is referred to in s. 41. So as the  
29 lead federal agency, we fulfil two main roles in  
30 marine pollution response. The first role is if a  
31 polluter is known, willing and able to respond to  
32 a marine pollution incident, then we will, the  
33 Coast Guard will let the polluter respond to the  
34 marine pollution incident once we are satisfied  
35 with the polluter's intentions and response plans.  
36 However, if a polluter is unknown, or if a  
37 polluter is unwilling or unable to respond, then  
38 the Coast Guard will manage the response and  
39 ensure an appropriate response to the incident,  
40 bearing in mind that the polluter always pays for  
41 the cost of the response, as well as pollution  
42 damage.

43 Q When you were describing the two types of marine  
44 spills that you were responsible for with Coast  
45 Guard, you said one was ship source, and then the  
46 other, I just wanted to make sure we got the  
47 record clear, was it mystery spills, or industry

1 source?

2 MR. DI FRANCO: Mystery source.

3 Q Mystery.

4 MR. DI FRANCO: We assume responsibility for mystery  
5 source spills because we assume the spill came  
6 from a ship somewhere, unless it's verified after  
7 that it's land based. And in terms of land-based  
8 spills, the Canadian Coast Guard has no lead  
9 agency authority for land-based spills. Land-  
10 based spills are the responsibility of the  
11 province, or if it comes from a federal facility,  
12 it would be Environment Canada that would manage  
13 the response to that. So in terms of mystery  
14 spills, we assume it's ship source and we take  
15 care of those, until it's determined that it's a  
16 land-based source. And it could be industry, or  
17 it could be sewer outfall, or whatever, but in  
18 terms of mystery spills, we assume it's ship  
19 source, until proven otherwise.

20 Q Okay. Is evaluation of habitat impacts from  
21 marine pollution part of the Coast Guard's  
22 mandate?

23 MR. DI FRANCO: Well, what the Coast Guard does is when  
24 a report of a marine pollution incident is  
25 reported to the Canadian Coast Guard, the first  
26 thing that the duty officer will do is conduct a  
27 visual assessment of the incident. So they get  
28 the call, they go out, do the assessment, and the  
29 initial assessments are always done by Coast Guard  
30 so if they see a beach, or an agriculture site, or  
31 shoreline, or any other habitat is being impacted  
32 by oil, then yes, that's the first bit of  
33 assessment that's done by the Canadian Coast  
34 Guard. And if further assessment is required,  
35 then the appropriate agencies are brought in to  
36 conduct further assessments.

37 Q And which agencies would be responsible for  
38 addressing short or long-term habitat impacts?

39 MR. DI FRANCO: The agencies within the Regional  
40 Environmental Emergencies Team, the REET will  
41 decide which agencies are appropriate to determine  
42 long-term, or short and long-term habitat impacts.

43 Q Okay. Maybe just picking up on that, you can  
44 explain what the REET is. It's described as the  
45 Regional Environmental Emergency Team, and what is  
46 that?

47 MR. DI FRANCO: Yeah. The REET is a body of advisors,

1 a body of experts that provide technical,  
2 scientific and environmental advice to the  
3 Canadian Coast Guard as a lead agency. The REET  
4 was initially formed in 1973 from a cabinet  
5 decision, and their main role is to provide, as I  
6 said, the scientific, environmental and technical  
7 advice to the Canadian Coast Guard.

8 The REET is chaired by Environment Canada.  
9 They're the lead of REET and in some regions in  
10 Canada, the province will co-chair with  
11 Environment Canada. And in British Columbia, I  
12 believe that is the case.

13 So the type of information that the REET will  
14 provide the Canadian Coast Guard can include all  
15 types of information. They'll provide information  
16 such as weather and marine forecasts, sampling  
17 analysis, shoreline clean-up assessment, work,  
18 still trajectory modelling, disposal, information  
19 regarding disposal. We will go to REET to ask for  
20 approval regarding alternate response strategies,  
21 which can include using chemical dispersants or *in*  
22 *situ* burning. They will conduct wildlife  
23 monitoring, as well as habitat and fisheries  
24 monitoring or analysis where it's needed.

25 The REET is just one -- you can view the REET  
26 as one-stop shopping for all of this technical,  
27 and scientific, and environmental advice. They  
28 are just one component of the response pie, so to  
29 speak that the Coast Guard takes into  
30 consideration before deciding what type of  
31 response action needs to be implemented.

32 Q All right. And just to clear up something, in the  
33 PPR document that has been marked now in these  
34 proceedings, and identified in paragraph 60, that  
35 the provincial emergency program was the co-chair  
36 of REET with Environment Canada; is that correct?  
37 Is it the B.C. Provincial --

38 MR. DI FRANCO: Sorry, can you repeat again?

39 Q Is it the provincial emergency program that co-  
40 chairs the REET with Environment Canada, or is it  
41 the Province's Ministry of Environment, generally?

42 MR. DI FRANCO: In B.C., it's my understanding that  
43 it's the Ministry of Environment, in B.C. --

44 Q And not the --

45 MR. DI FRANCO: -- that co-chairs with Environment  
46 Canada.

47 Q Not the provincial emergency program?

1 MR. DI FRANCO: I don't believe so. You would have to  
2 ask the Province to clarify that.

3 Q Okay. Are REETs always convened if there is a  
4 marine pollution incident?

5 MR. DI FRANCO: No, they're not always convened. It  
6 certainly depends on the type of incident that  
7 we're dealing with, and the circumstances  
8 surrounding the incident.

9 Q Okay. How does the Coast Guard determine whether  
10 or not a REET will be in place to respond to a  
11 marine pollution incident?

12 MR. DI FRANCO: Well, really, there's two ways in which  
13 REET could be activated. Environment Canada is  
14 included in the callout list that marine pollution  
15 incidents get reported to. So a report will come  
16 in, and in B.C., I believe it's the Regional  
17 Marine Information Centre, the RMIC. They will  
18 fan out the marine pollution incident to various  
19 agencies, one of them is Transport Canada, Marine  
20 Safety. The other one is Canadian Coast Guard,  
21 the duty officer that's on call. The third one is  
22 Environment Canada, and the fourth one is the  
23 Province of B.C. So those incidents get reported  
24 to those agencies. So the Coast Guard, upon  
25 receiving a call, will do an assessment of the  
26 marine pollution incident, and upon that  
27 assessment, if further action is required,  
28 information is required, they will call upon the  
29 REET, they will call Environment Canada to  
30 activate the REET and then at that point,  
31 Environment Canada will convene a meeting and  
32 start dealing with the issues with the problems at  
33 hand.

34 The other way is that REET can self-activate,  
35 if you will, in that as since Environment Canada  
36 gets the same report that the Canadian Coast Guard  
37 does, they can activate themselves if they feel  
38 it's necessary to deal with a certain incident.

39 Q All right. So that would be a decision by  
40 Environment Canada and the Province to, what you  
41 called, self-activate a REET?

42 MR. DI FRANCO: Yes.

43 Q Okay. Does the Coast Guard, when making a  
44 decision as to whether a REET is necessary, talk  
45 to the Department of Fisheries and Oceans, and I  
46 recognize that Coast Guard is part of DFO, but the  
47 non-Coast Guard part of DFO, is there a

1 conversation between the two sides of DFO in  
2 assessing whether or not a REET is required in a  
3 marine spill?

4 MR. DI FRANCO: Generally, no. The Canadian Coast  
5 Guard will talk with the chair of REET and the co-  
6 chair. So it will be Environment Canada and the  
7 Province in B.C.'s case. The chair or co-chair  
8 will decide, normally, if DFO Habitat and Science  
9 is required.

10 Q All right. And can you give me an example of when  
11 you would not have a REET?

12 MR. DI FRANCO: Well, in the majority of cases that  
13 Canadian Coast Guard deals with, which are, you  
14 know, normally, small discharges of oil, in the  
15 majority of those cases, the REET is not called  
16 upon simply because the spills are small,  
17 dispersed quickly, or there are no major resources  
18 at risk or impacts that are noted. So for  
19 example, the Coast Guard gets a lot of calls  
20 regarding spills in harbours, or ports, or  
21 derelict vessels that are, you know, slowly  
22 leaking oil, and whatnot, but that aren't causing  
23 much damage, or where the oil is not spreading  
24 significantly. The REET normally isn't called for  
25 those types of incidents. That's not to say that  
26 they wouldn't be, depending on where the incident  
27 is occurring and what sort of resources are at  
28 risk, but generally, those types of incidents  
29 don't include the REET.

30 Q To the next question, I'll start with you, Mr.  
31 Di Franco, but then I'd like to just ask the Panel  
32 if they have anything to add to whatever your  
33 answers are. So the first question is in relation  
34 to marine pollution incidents, is there a  
35 mandatory role for DFO Science on a REET?

36 MR. DI FRANCO: I'm answering first?

37 Q Yeah.

38 MR. DI FRANCO: Okay. No, generally, there is no  
39 mandatory role for DFO Science to be on the REET.  
40 That decision is made by the chair of REET. And  
41 again, it depends on the issues that are being  
42 dealt with in the incident. If there's a specific  
43 issue where the chair feels that DFO Science  
44 should be called upon, then they will do that.

45 Q Okay. Thank you.

46 MR. DI FRANCO: But generally, no, they're not  
47 mandatory. The way the REET works, not only in

1 Pacific, but in all other regions in Canada, is as  
2 the incident, the response to an incident  
3 progresses or escalates and the issues become more  
4 and more prominent, then the REET will escalate  
5 and will bring on advisors from other agencies  
6 when required and as appropriate. They will not  
7 call them automatically.

8 Q Okay. And then I'd just like to open it to the  
9 Panel, then, starting with you, Dr. Ross, do you  
10 have any comment to add to that?

11 DR. ROSS: Well, not being privy to, I guess, the  
12 structure of the REET and its obligations and  
13 organizational structure, I can't really comment  
14 on that. I can say that I was invited to serve on  
15 two REETs that I recall out of a number of major  
16 incidents. That was the Robson Bight incident and  
17 the Westisle, the *MV Westisle* sinking.

18 Q And Mr. Reid?

19 MR. REID: My understanding is similar to Mr. Di  
20 Franco, in that DFO doesn't have a mandatory role  
21 on REET. They are invited to participate when as  
22 needed, or as required.

23 Q And then the next question, back to you, Mr. Di  
24 Franco, what about DFO Habitat staff? Is there a  
25 mandatory role for DFO Habitat staff on the REET?

26 MR. DI FRANCO: It's the same reply as DFO Science.  
27 They are called upon as required, as the issues  
28 dictate.

29 Q Okay. And anything to add, either Dr. Ross, or  
30 Mr. Reid?

31 DR. ROSS: Well, my understanding in the past has been  
32 that our Habitat staff, particularly Water Quality  
33 Unit had key expertise in terms of understanding  
34 the nature of point source spills and impacts on  
35 fish and fish habitat. And those same staff, it  
36 was a small group, but those same staff members,  
37 would confer with experts within the Science realm  
38 at DFO, including myself and/or others. So  
39 certainly, in the past, there was good  
40 communication between Science and Habitat. Our  
41 advice was solicited on a regular basis.  
42 Sometimes, you know, on these urgent matters or  
43 emergencies, but certainly that has tapered off of  
44 late, in part because those staff members no  
45 longer have a role, the Water Quality Unit has  
46 been disbanded, and we no longer have  
47 conversations on these matters.

1 Q Thank you. And Mr. Reid, anything to add?

2 MR. REID: Just that in terms of does the Habitat part  
3 of DFO have a mandatory role? It's not mandatory  
4 and the Habitat Program staff are brought into the  
5 REET process when requested. Just a bit of a  
6 comment on Mr. Ross's, he's correct, in the past,  
7 there was a dialogue between the two, Habitat and  
8 Science, and so there has been, you know, a change  
9 over time.

10 Q Okay. Going back to the Panel again, I'll start  
11 with you again, Mr. Di Franco, and then open it to  
12 the other two. In a REET, which agency is  
13 responsible to advise on impacts on anadromous  
14 fish and fish habitat in the marine environment?

15 MR. DI FRANCO: Again, that would be the chair of REET  
16 who would determine the agency that should be  
17 brought in to determine those impacts.

18 Q Okay.

19 MR. DI FRANCO: So Environment Canada.

20 Q And Dr. Ross?

21 DR. ROSS: Well, based on my experience, that may be  
22 the case, but I would, I guess, like to remind  
23 people that the REET is a voluntary organization,  
24 it's multi-agency, and it provides advice. In my  
25 experience, that advice has been ignored. And so  
26 it strikes me that if we're providing expert  
27 advice, as scientists, as to natural resources  
28 that are important to our agencies, such as  
29 anadromous fish or marine mammals, it would be  
30 nice to know that there was a formalized role for  
31 the provision of that advice and, I guess,  
32 credence paid to the nature of that advice and  
33 what can be done to mitigate.

34 Q And Mr. Reid, you've been involved in REETs in  
35 your role as a DFO Habitat representative. Can  
36 you add any content here as to which agency is  
37 responsible for advising on impacts to anadromous  
38 fish and fish habitat in a marine environment?

39 MR. REID: My perspective is that the chair of REET,  
40 normally Environment Canada, would seek advice  
41 from Fisheries and Oceans Canada on impacts  
42 related to anadromous fish and fish habitat. And  
43 normally, DFO would be providing advice  
44 specifically around the impacts on fish habitat  
45 currently, and that would be advice given to the  
46 REET as required. It could be issues around the  
47 shoreline, it could be issues where fish are

1 present, and where fisheries are taking place.  
2 And so it's a range of advice that we provide to  
3 the REET.

4 Q But do you agree with Dr. Ross that there is no  
5 formal requirement for Environment Canada to seek  
6 that advice, that it may happen, but it also may  
7 not happen?

8 MR. REID: It's not mandatory for Environment Canada to  
9 seek that advice, but normally, they would do  
10 that.

11 Q And then in terms of monitoring and sampling in  
12 relation to spills in the marine environment and  
13 how those spills may affect anadromous fish and  
14 fish habitat, I'll just start with you, Dr. Ross,  
15 is it important to monitor and to sample the  
16 environment after a marine spill?

17 DR. ROSS: Well, again, I guess, as a scientist and  
18 observer on a number of incidents, I like to  
19 understand what's going on in the environment and  
20 obviously, that starts with understanding the  
21 nature of the liquid that has been spilled. It's  
22 not always diesel, it's not always a light fuel  
23 that's going to dissipate. It might be a crude  
24 oil with thousands of hydrocarbon constituents, it  
25 might be a toxic chemical that is acutely lethal  
26 or chronically problematic for organisms. So from  
27 my perspective, when we look at a spill, there's  
28 no single formula for what happens in the event of  
29 a spill. There are hundreds, if not thousands of  
30 permutations and possibilities and I think it's  
31 important to have scientists, experts in the field  
32 that are engaged, that are informed, that are kept  
33 in the loop, that can provide advice, that can  
34 perhaps recommend sampling, monitoring, and help  
35 to guide the efforts with regard to mitigation or  
36 cleanup or the protection of natural resources,  
37 including traditional foods for local First  
38 Nations. And I guess that's where I see a role  
39 for Science. It's important to understand where  
40 these pollutants go in the environment, how they  
41 behave, in what type of fish, and invertebrates,  
42 and marine mammals or seabirds they might end up,  
43 the harm they might do, and a lot of that, in my  
44 view, would require the engagement of scientific  
45 research and/or monitoring.

46 I might also add that in the past, we, as  
47 scientists, have provided guidance to that effect,

1 to collect samples in support of prosecutions  
2 pursuant to s. 36 of the **Fisheries Act**. And if we  
3 aren't collecting samples under the guidance of  
4 scientific researchers who are expert in the  
5 collection of these samples, and the selection of  
6 those samples, and the design of those follow-up  
7 studies, then I fear that we are incapacitated, I  
8 guess, as those who might apply the letter of the  
9 law and pursue the responsible party, or the  
10 polluter who is supposed to pay at the end of the  
11 day.

12 Q Thank you. Mr. Di Franco, I understand that any  
13 samples or monitoring plans that are required in  
14 relation to a spill in the marine environment are  
15 specified in a monitoring plan; is that right?

16 MR. DI FRANCO: Sorry, can you repeat one more time?

17 Q Yeah. Where there is a marine spill and  
18 collection of samples or monitoring is required,  
19 that's specified in a monitoring plan for that  
20 spill?

21 MR. DI FRANCO: Yes. Yes, it is.

22 Q And who develops the pollution monitoring plan in  
23 response?

24 MR. DI FRANCO: That depends. If a polluter is willing  
25 and able to do the response, then they will be the  
26 ones who will develop a monitoring plan, and that  
27 monitoring plan is given to Coast Guard and the  
28 REET to review and for Coast Guard and REET to  
29 comment on. And if any changes or amendments to  
30 the monitoring plan are required, then the Coast  
31 Guard will ensure that the polluter makes those  
32 amendments. If it's a mystery spill, or if the  
33 polluter is unable and unwilling to respond and  
34 produce a monitoring plan, then it's REET's  
35 responsibility to get that monitoring plan  
36 completed within its own organization.

37 Q You said that the monitoring plan would be given  
38 to Coast Guard and to the REET to review. Would  
39 REET advise the Coast Guard as to whether the  
40 monitoring plan was sufficient, or not?

41 MR. DI FRANCO: Absolutely.

42 Q And is the Coast Guard required to follow the  
43 advice provided by REET?

44 MR. DI FRANCO: No, the Coast Guard does not have to  
45 follow the advice of REET. It depends on a  
46 variety of factors and the circumstances  
47 surrounding the situation. Generally, the Coast

1 Guard does accept REET's advice, but the  
2 information that is provided by REET is just one  
3 component of the overall response plan, I guess  
4 you can say.

5 Q And if Science was involved in providing advice on  
6 a monitoring plan, that advice from Science would  
7 come through the REET; is that right?

8 MR. DI FRANCO: Yes, through the chair.

9 Q Okay. So what kinds of considerations would the  
10 Coast Guard have in making adjustments to a  
11 monitoring plan that has been recommended by the  
12 REET?

13 MR. DI FRANCO: Well, there could be a number of  
14 considerations that the Coast Guard would  
15 consider. I'll give you some examples. There's  
16 worker safety issues, public safety issues, the  
17 nature of the product spilled, weather conditions,  
18 or forecast conditions, tide information, cost and  
19 reasonableness of the effort or the monitoring  
20 could also come into play. Those are the other  
21 bits of information that the Coast Guard has to  
22 consider before, you know, including the advice  
23 from REET, those are all the things that the Coast  
24 Guard needs to consider to determine the  
25 appropriate steps that need to be taken.

26 Q And the comment that reasonableness would be  
27 considered and whether the cost is reasonable, how  
28 is that assessed? Who makes the determination as  
29 to what is reasonable and what are the factors in  
30 understanding reasonableness?

31 MR. DI FRANCO: Reasonableness is a little bit  
32 difficult to explain. Basically, any action that  
33 is taken by either the polluter or ourselves has  
34 to be reasonable. It has to basically pass the  
35 test of reasonableness. The fact that we are in a  
36 regime where the polluter pays, we adopt a  
37 polluter pay principle, meaning the polluter must  
38 pay for all monitoring, any monitoring costs  
39 incurred by the government, or any responsive  
40 costs incurred by the government, the actions have  
41 to be reasonable in that we cannot implement any  
42 action or response action that is too costly and  
43 above and beyond what a reasonable person would  
44 implement. For every action that we take in a  
45 marine pollution incident, we always try to  
46 recover our costs, and that's done through either  
47 the polluter, their insurance company, or if not

1 the polluter, then we go through the Ship Source  
2 Oil Pollution Fund. And when we submit our claim  
3 to the polluter, to the insurance company or the  
4 Fund, we have to demonstrate reasonableness in our  
5 actions. If any actions are deemed unreasonable,  
6 then the Coast Guard will not recover its  
7 monitoring or response costs. So reasonableness,  
8 again, basically means that anything that is  
9 implemented has to be -- that you have to conduct  
10 a cost benefit analysis, so to speak, to help  
11 determine if an action is reasonable.

12 There isn't one clear definition for  
13 reasonable. We've asked our legal department to  
14 help us to do that and come back with some  
15 suggestions, but basically, any reasonable action,  
16 any action is considered reasonable if another  
17 reasonable person would implement a similar or  
18 same action. That's probably the best definition  
19 I can come up with right now.

20 Q All right. And who on the Coast Guard, like, what  
21 level, I guess, of position within Coast Guard  
22 makes that assessment of reasonableness? Is it  
23 one person, is it a group of people?

24 MR. DI FRANCO: I mean, it normally rests with the on-  
25 scene commander or federal monitoring officer.  
26 It's, I guess, the Coast Guard representative on  
27 site, who's in charge of the incident. We call  
28 that person on-scene commander or federal  
29 monitoring officer, depending on the posture that  
30 the Coast Guard has taken. They would normally  
31 take that decision, however, if that person needs  
32 to consult with other members within the Coast  
33 Guard, then, you know, they are certainly free to  
34 do that, and they have done that in the past.

35 Q And what kind of qualifications would the on-scene  
36 commander have? Would they be scientists,  
37 biologists, what would they be?

38 MR. DI FRANCO: Those qualifications are -- actually,  
39 we have an on-scene commander and federal  
40 monitoring officer directive, which are in the  
41 documents, in the documents here, and those  
42 directives list the experience and qualifications  
43 that are required to conduct those functions.

44 Q All right. Could I ask you just to look at  
45 Canada's document number 53 and just tell me if  
46 that's what you're referring to?

47 MR. DI FRANCO: Yeah. Just give me a minute, here.

66  
PANEL NO. 53  
In chief by Ms. Baker

1 Q Oh, sorry, maybe look at 52 and 53.

2 MR. DI FRANCO: Yes, that's correct, 52 directive,  
3 3030-2002-01 and 3040-2002-02, if you refer to  
4 those documents, there is a list of guidelines,  
5 criteria for conducting the function of the  
6 federal monitoring officer or on-scene commander.

7 Q Okay.

8 MS. BAKER: Why don't we have those pulled up and  
9 marked as exhibits, then. So we'll start with  
10 Canada's document 52.

11 THE REGISTRAR: It will be marked as exhibit number  
12 1374.

13

14 EXHIBIT 1374: Fisheries and Oceans Canada,  
15 Canadian Coast Guard, Directive D-3030-2002-  
16 01 re Federal Monitoring Officer

17

18 MS. BAKER: And the next one would be Canada's document  
19 53.

20 THE REGISTRAR: 1375.

21

22 EXHIBIT 1375: Fisheries and Oceans Canada,  
23 Canadian Coast Guard, Directive D-3040-2002-  
24 02 re On-Scene Commander

25

26 MS. BAKER:

27 Q So if we go to Exhibit number 1375, does that help  
28 us to understand the qualifications of the person  
29 who's making that reasonableness decision?

30 MR. DI FRANCO: Yes, and, of course, the federal  
31 monitoring and on-scene commander is an individual  
32 within the Coast Guard that has also conducted the  
33 required training and, you know, years of service,  
34 or whatnot. The Environment Response Program has  
35 a training program for our responders which starts  
36 off with basic level training and goes up all the  
37 way to on-scene commander training. So those  
38 individuals who receive all the training and have  
39 had enough years of experience, I guess, would  
40 fulfil these functions.

41 Q All right. So if we turn to, in that document  
42 I've just identified, Exhibit 1375, s. 3.2  
43 "Guidelines to assist in the selection of an  
44 appropriate on-scene commander," that is the list  
45 that would explain the qualities in an on-scene  
46 commander; is that right?

47 MR. DI FRANCO: Oh, sorry, I'm in -- 3.2?

1 Q Yeah.

2 MR. DI FRANCO: Page 5, yes.

3 Q All right. And if you'd turn the page to page 6,  
4 one of the items is "the ability to identify the  
5 public's interests and priorities." And how is  
6 that determined?

7 MR. DI FRANCO: "Ability to identification the public's  
8 interests and priorities." Well, I mean,  
9 identifying public's interests and priorities is  
10 mainly conducted through the liaison function, the  
11 liaison officer within our Response Management  
12 System. That person is responsible for talking  
13 and engaging with the public and determining what  
14 their priorities, interests and concerns are, and  
15 then that information is passed on to the on-scene  
16 commander.

17 Q Is there ever an involvement higher up, say, to an  
18 ADM level, or that sort of level to where there is  
19 perhaps some uncertainty about whether a cost  
20 should be incurred, or not? Does it go further up  
21 the chain to get some guidance from an ADM, or  
22 regional director, or even a minister?

23 MR. DI FRANCO: It could, yes, depending on the  
24 incident and the circumstances surrounding an  
25 incident, it could.

26 Q All right. And in making decisions on the REET,  
27 would the Coast Guard also take into account  
28 information sheets or standards from international  
29 organizations, for example, from NOAA, in the  
30 U.S., or any other similar organizations?

31 MR. DI FRANCO: Yes, it could.

32 Q Okay. And if the Coast Guard had science advice  
33 directly relevant to a spill from the scientists  
34 within DFO, would that direct science advice take  
35 precedent over international fact sheets or  
36 information that we've just talked about?

37 MR. DI FRANCO: I can't say for certain. It would  
38 depend on the situation, the incident and the  
39 circumstances surrounding the incident.

40 Q Okay.

41 MR. DI FRANCO: It may or may not.

42 Q And in terms of a proposal to remediate a site, if  
43 that was put forward by a polluter and the  
44 polluter had a different -- and perhaps they've  
45 engaged a cleanup company to do that work for  
46 them, if that company or polluter had a different  
47 view of how the site should be cleaned up, or what

- 1 monitoring should be done in relation to the site,  
2 if that polluter information differed from DFO  
3 Science or REET's advice, would Coast Guard prefer  
4 the advice from their scientists and REET?
- 5 MR. DI FRANCO: Again, it depends on the circumstances  
6 surrounding the incident, it may or may not.
- 7 Q Okay. In terms of these monitoring plans, who  
8 actually enforces them? Who makes sure that they  
9 are followed and done properly?
- 10 MR. DI FRANCO: Well, the monitoring plan is part of  
11 the overall response plan so that responsibility  
12 falls to the lead agency, so it would be, for ship  
13 source or mystery source spills, that would be the  
14 Coast Guard.
- 15 Q Okay. And it would be Coast Guard's  
16 responsibility, then, to assess the monitoring and  
17 ensure that it was done correctly?
- 18 MR. DI FRANCO: They would be responsible for ensuring  
19 the monitoring plan is implemented as described.
- 20 Q Okay. And where do the actual results from the  
21 monitoring go? Who receives those results and  
22 assesses them?
- 23 MR. DI FRANCO: Those results go to the lead agency, so  
24 the Canadian Coast Guard, as well as all members  
25 of the REET.
- 26 Q And is it done as a kind of a reporting at the end  
27 of the project, or how does that happen?
- 28 MR. DI FRANCO: Well, those types of details are  
29 specified in the monitoring plan. Each monitoring  
30 plan, obviously, will be different, and the  
31 monitoring plan will specify exactly when, where,  
32 how and who will get the results so it's all done  
33 within the monitoring plan.
- 34 Q And if the results of the monitoring show that  
35 there's an ongoing problem in the environment,  
36 what would be the outcome?
- 37 MR. DI FRANCO: Well, if there was an ongoing problem  
38 that was noted, the Coast Guard, as lead agency,  
39 would have to re-engage the polluter to amend the  
40 situation and amend the monitoring plan, or do  
41 whatever the Coast Guard feels is necessary to  
42 remediate the situation, and that would be done in  
43 conjunction with REET.
- 44 Q Okay. All right. So in terms of receiving advice  
45 on anadromous fish and fish habitat, the Coast  
46 Guard relies on the REET or the lead agency to  
47 coordinate that advice, that's right?

1 MR. DI FRANCO: Yes, the Coast Guard would rely on the  
2 REET, yes.

3 Q All right. And would be through the lead agency,  
4 which is Environment Canada for the federal  
5 government; is that right?

6 MR. DI FRANCO: Well, we'd call Environment Canada  
7 chair, the chair of REET so --

8 Q Sorry.

9 MR. DI FRANCO: -- it would be through them.

10 Q All right. Dr. Ross, are you satisfied that  
11 Environment Canada has sufficient expertise to  
12 advise on anadromous fish and fish habitat in the  
13 marine environment, including on monitoring and  
14 sampling programs?

15 DR. ROSS: Well, traditionally, DFO conducted the  
16 overwhelming amount of research related to  
17 environmental contaminants in the marine  
18 environment, and DFO also has the position or the  
19 opportunity to engage in sampling aboard a number  
20 of small, medium and large-sized research vessels.  
21 DFO also has a notable collection of experts in a  
22 wide variety of disciplines related to the natural  
23 resources for which we are custodians and  
24 managers. So I certainly see that DFO has a  
25 tremendous amount of expertise on the resources  
26 that are out at sea, and I also know from personal  
27 and professional experience that DFO has  
28 traditionally had a number, not a large number,  
29 but a number of contaminant experts. These are  
30 people who understand the nature of the many tens  
31 of thousands of chemicals out in the world and in  
32 the marine environment. I'm a toxicologist. That  
33 means I'm concerned about the adverse health  
34 effects of some of these chemicals on biota,  
35 including marine mammals, and fish, and other  
36 creates.

37 In looking at Environment Canada, I have  
38 excellent colleagues, both in the freshwater  
39 environment and in the marine environment, but  
40 most of them would be working on either non-  
41 migratory resident species of fish, even Great  
42 Lakes or in other freshwater ecosystems,  
43 landlocked, or sea birds, some excellent long-term  
44 spatial and temporal monitoring using herring  
45 gulls in the Great Lakes, double-crested  
46 cormorants, great blue herons out here in British  
47 Columbia, osprey, and these research projects and

1 monitoring programs have shed tremendous insight  
2 into a lot of chemicals of concern.

3 If I look at anadromous fish and marine  
4 mammals, first of all, back to the natural  
5 resources, the biology, ecology and habitat use of  
6 these sorts of species, simply put, they remain  
7 the purview of the Department of Fisheries and  
8 Oceans. To extricate contaminants or pollutants  
9 from those marine mammals and fish and expect our  
10 colleagues at Environment Canada to have the  
11 intellectual, technological and logistical  
12 capacity to understand what these types of  
13 contaminants might do to anadromous fish and/or  
14 marine mammals, is a tall order, I would say, and  
15 it is not happening.

16 Q In your view, is the Coast Guard the appropriate  
17 agency to determining monitoring and mitigation  
18 plans designed to evaluate the short and the long-  
19 term impacts on habitat and anadromous fish?

20 DR. ROSS: Well, I note for the on-scene commander  
21 requirements, a list of 12 or 15 competencies, and  
22 that's an impressive list, and certainly, Coast  
23 Guard has their work cut out for them when such an  
24 emergency happens. It's often in bad weather and  
25 remote environments and entails pulling a lot of  
26 logistical firepower into the fray. I'd have to  
27 say, though, that environmental monitoring, or  
28 concerns about fish and fish habitat fade to  
29 background when there are questions of human  
30 safety or equipment safety, as to whether it's the  
31 safety of the crews involved in the incident, or  
32 the crews responding to that incident. And I  
33 don't wish to pass judgment on that, but I would  
34 like to say that from my perspective, I remain  
35 concerned that, you know, understanding the  
36 impacts to natural resources and mitigating those  
37 impacts requires scientific understanding and  
38 would require active scientific investigation and  
39 a collection of samples that would be of use  
40 either in terms of understanding what's happening,  
41 what the impacts are on those resources, or  
42 eventually, in prosecution.

43 Q Thank you. And Mr. Reid, do you have anything to  
44 add to that?

45 MR. REID: Just that I'm not really aware of what  
46 expertise Environment Canada has with respect to  
47 anadromous fish and fish habitat. What I can say

1 is that, certainly, Fisheries and Oceans has, in  
2 Pacific Region, a considerable knowledge and  
3 expertise on the biology, ecology, habitat  
4 requirements of anadromous fish and fish habitat  
5 and so in the event of a spill event that we could  
6 encounter, anadromous fish and fish habitat, or  
7 marine mammals, you know, we would expect to be --  
8 certainly, our advice would be important. And  
9 similarly, with respect to monitoring programs,  
10 it's highly scientific, requires careful and  
11 experienced knowledge in terms of what to sample  
12 for, how to sample it, where to sample it, dealing  
13 with very complex compounds and from a management  
14 side, we very much look to our Science colleagues  
15 to provide that advice.

16 Q And Mr. Di Franco, I need to ask you, as well, do  
17 you think that the Coast Guard is the appropriate  
18 agency, then, to determine monitoring and  
19 mitigation plans to protect anadromous fish and  
20 fish habitat?

21 MR. DI FRANCO: Well, the Coast Guard doesn't develop  
22 those plans. This is why we engage REET, because  
23 we rely on REET's expertise to either develop  
24 those plans or review the polluter's monitoring  
25 plans. And whatever expertise is required, you  
26 know, again, depending on the nature of the  
27 incident and the resources that are at risk or  
28 impact, we'll call upon those appropriate agencies  
29 to get that expertise. But you know, like I said  
30 before, the Coast Guard does not develop those  
31 plans, we do not have the expertise to develop  
32 those monitor plans. We have expertise in other  
33 areas, but habitat monitoring and impact  
34 assessment, those types of things, we don't do  
35 those things, we're not experts in that area.  
36 This is why we rely on the REET to help us with  
37 this area, to either develop the plans or review  
38 the polluter's monitoring plans.

39 Q But you've already told us today that the Coast  
40 Guard is not required to accept the advice of REET  
41 and, in fact, has a series of considerations that  
42 it looks at in addition to the advice received  
43 from REET?

44 MR. DI FRANCO: Yes. The REET makes up one part of the  
45 response operation. We look at REET as a group  
46 for consolidated advice regarding a whole variety  
47 of areas. And we take that advice. The

1 information we get from REET, we take that into  
2 consideration and consider it with all the other  
3 aspects of the response that we're dealing with at  
4 the same time. There's, you know, operational  
5 issues, management issues, reasonableness, legal  
6 issues, public interest issues. There's a whole  
7 variety of issues that the Coast Guard needs to  
8 deal with in a marine pollution incident, and the  
9 information that we get from REET just makes up  
10 one of those bits of information to help us  
11 determine which response strategy to implement and  
12 what will be the most effective.

13 Q All right.

14 MR. DI FRANCO: Now, the Coast Guard values the advice  
15 it gets from REET and, generally, we do accept and  
16 implement their advice, but there are cases where  
17 that's not always the case and there, generally,  
18 are reasons for that.

19 Q All right. I mean, there certainly could be  
20 incidences where Science advice proffered through  
21 the REET advised for a type of monitoring plan  
22 that the Coast Guard felt was not reasonable and  
23 then would not implement; is that right?

24 MR. DI FRANCO: Sorry, can you say again?

25 Q If Science, through the REET, could identify a  
26 type of monitoring plan, that the Coast Guard  
27 would then be able to review and decide it was not  
28 reasonable and then not actually implement that  
29 plan; is that right?

30 MR. DI FRANCO: That could happen. That could happen.

31 Q Okay.

32 MR. DI FRANCO: It could or could not happen, yes. And  
33 you know, taking into account all the other bits  
34 of information that the Coast Guard is assessing  
35 at the same time, that could happen, yes.

36 Q Okay. I want to move to a couple of incidents.  
37 One is the Robson Bight spill in 2007, and another  
38 one was in Burrard Inlet, a spill from Kinder  
39 Morgan, also in 2007. So I want to start with  
40 you, Dr. Ross. In 2007, there was an incident in  
41 Robson Bight where a barge carrying logging  
42 equipment capsized in the ecological reserve, and  
43 you were brought into that REET; is that right?

44 DR. ROSS: That's correct.

45 Q And what was your role?

46 DR. ROSS: Well, I was on of the experts brought aboard  
47 because I work with marine mammals and it is now a

1 critical habitat for northern resident killer  
2 whales listed as threatened under the **Species at**  
3 **Risk Act**. The reserve was pre-established as a  
4 provincial park area. There were obviously  
5 concerns about the implications of the spilled  
6 liquids, including diesel to the rubbing beaches,  
7 which were nearby. These are a very special  
8 cultural component for the northern resident  
9 killer whales. No other spot in the world do  
10 killer whales come up onto a beach area and rub  
11 themselves on cobble so it's considered a very  
12 important part of what the habitat needs are for  
13 northern resident killer whales. So I was there  
14 to provide input as an expert on marine mammals,  
15 but also on the nature of these pollutants and the  
16 risk that they might present to killer whales in  
17 particular.

18 Q And was there any party, if you recall, on that  
19 REET, that was tasked with looking at risk to  
20 fish, anadromous fish or fish habitat?

21 DR. ROSS: As I recall, there was a sense of  
22 frustration that the REET did not have any fish or  
23 fish habitat expertise, although eventually, we  
24 did have a local biologist, I've forgotten his  
25 name just now, who did come aboard and provide  
26 some advice on important areas around the zone of  
27 the spill.

28 Q And in this example, the Robson Bight spill,  
29 Science advice was provided by you; is that right?

30 DR. ROSS: In part.

31 Q And was that Science advice accepted by the Coast  
32 Guard?

33 DR. ROSS: We had daily conference calls so the REET  
34 would have a daily briefing and conference call,  
35 and that was an opportunity to get updated on the  
36 conditions. It was an opportunity for the  
37 different REET members to report on their  
38 interpretation of risks and what was happening  
39 over time. And as I recall, I was alerted to the  
40 incident about 23 or 24 hours after it first  
41 happened. There had been over flights, there had  
42 been site visits. I believe Burrard Clean, as a  
43 contract and cleanup party, was either on site or  
44 almost on site. And very early on, because we  
45 were unaware of the exact nature of the different  
46 liquids that had spilled, I had recommended the  
47 use of booms, if possible, to keep any fuels or

1 oils off the rubbing beaches, because that could  
2 be injurious to killer whales. That advice was  
3 followed quickly, I believe by Burrard Clean, and  
4 the booms were taken down within about 36 to 48  
5 hours because the fuels had primarily dissipated  
6 and there were concerns expressed by others that  
7 the booms might get in the way of the resident  
8 killer whales as a bit of a structural obstacle.

9 We had 60 killer whales swim through the  
10 diesel slick on day two, highlighting the fact  
11 that our concerns were real and tangible, and that  
12 events were a little bit outside of our control at  
13 that point.

14 Q Okay. If I could ask you to turn to Tab 6 of the  
15 Commission's documents, there's an email chain  
16 there. And if you'd go to maybe the third page --  
17 the second page, I should say, of that email  
18 chain, there, you'll see it at the bottom, there,  
19 it's from Don Rodden to Larry Wilson and Fred  
20 Beach, and in this case, it says that the Coast  
21 Guard had not requested the responsible party to  
22 put in place a monitoring program to establish  
23 baseline information on the current state of  
24 hydrocarbon contaminants and sediments, biota and  
25 water column, et cetera, and then it refers to a  
26 NOAA fact sheet on small diesel spills. And then  
27 if you could go back sort of to the beginning of  
28 this email chain, there's actually an email from  
29 you, Dr. Ross, to Marilyn Joyce, where you say,  
30 regretfully:

31  
32 The position below has completely pre-empted  
33 the provision of advice from DFO Science. We  
34 have several research scientists expert in  
35 the area of transport and fate of  
36 contaminant, including hydrocarbons ...

37  
38 Et cetera, and you express some concerns with  
39 reliance on the NOAA fact sheet. Can you just  
40 explain what your concerns were there?

41 DR. ROSS: Yeah, I think what we're seeing here is a  
42 little bit of frustration on my part and of  
43 course, this was an email which is now very much  
44 in the public light, but you know, the frustration  
45 was a personal and professional one. I was  
46 involved in this REET, and on the call, one of the  
47 things that is not captured here is that on the

1 call, First Nations were very upset and very  
2 concerned about diesel getting into some of their  
3 local clam beds, which was happening. And I had  
4 suggested, on the calls, that we collect shellfish  
5 samples and, potentially, water samples, to  
6 conduct hydrocarbon measurements. And we did have  
7 enforcement officials, Conservation Protection had  
8 a team of two on scene, they were able to collect  
9 samples, but they were instructed not to, despite  
10 having volunteered to do that. And I guess, you  
11 know, in terms of what had happened, as I recall,  
12 there were concerns expressed on a conference call  
13 by Coast Guard that LeRoy Trucking Company did not  
14 have the funds to carry out some of these  
15 monitoring efforts.

16 Now, being sensitive to that because, as a  
17 Scientist, I know how difficult it is to raise  
18 money for research, and I know how expensive these  
19 analyses can be, I understood where that came  
20 from. At the same time, I was frustrated that as  
21 a scientist, with no budget and no capacity to  
22 follow my own recommendations, I was frustrated  
23 that nobody else was seemingly in a position to be  
24 able to fund some of these things which I  
25 considered to be an important part of making sure  
26 that the food supply, traditional food supply of  
27 local First Nations was safe, that killer whales  
28 were protected, and that we were really  
29 understanding where these different types of  
30 hydrocarbons were going in that local environment  
31 over time.

32 Q And were you satisfied that the NOAA fact sheet  
33 reflected the current state of knowledge that was  
34 relevant to the spill at issue?

35 DR. ROSS: Well, I guess I was a little disappointed  
36 that after a multitude of REET conference calls,  
37 where we had our own local experts participating  
38 and providing advice based on our, or in my case,  
39 my own understanding of the scientific literature,  
40 I was a little disturbed to find the Coast Guard  
41 relying almost exclusively on a one-page fact  
42 sheet from NOAA. I don't dispute that that is an  
43 important piece of information, but it's not the  
44 only piece of information that's relevant to that  
45 spill incident given the fuels involved. I would  
46 also point out that this decision was taken seven  
47 weeks after the incident so what we're talking

1 about here is a full seven weeks after the spill,  
2 at which point it was still the position of Coast  
3 Guard that the 10 to 17,000 litres worth of diesel  
4 had dissipated from the major source of fuel at  
5 the bottom, at 350 metres depth. That we later  
6 found with ROB inspection funded by our agency in  
7 conjunction with NGO's was not the case. That  
8 tanker truck was intact at the bottom of the  
9 ocean.

10 Also, there were a number of other non-diesel  
11 components. It was 17,000 litres of diesel, as I  
12 recall, but almost 3,000 litres of heavy  
13 lubricants, several hundred litres of hydraulic  
14 oils, about 2,500 litres of gasoline so to rely on  
15 a single fact sheet for diesel does not pay full  
16 credence to our due justice to the somewhat more  
17 complex loading on that barge.

18 Q Thank you.

19 MS. BAKER: I'd like that email chain to be marked as  
20 the next exhibit, please.

21 THE REGISTRAR: Exhibit number 1376:

22  
23 EXHIBIT 1376: Email chain entitled, "2007 10  
24 03 Robson Bight CCG response"  
25

26 MS. BAKER:

27 Q Again, Mr. Di Franco, I would like you to just --  
28 I don't know if you have any knowledge about why  
29 Coast Guard made the decision in the Robson Bight  
30 incident to not follow the recommendations from  
31 DFO Science and to rely on the NOAA fact sheet,  
32 but can you help us out in understanding why that  
33 decision was made?

34 MR. DI FRANCO: Well, I wasn't part of the conversation  
35 at that time, nor was I part of the decision-  
36 making process. Although I am familiar with the  
37 incident, I did do some reporting here in Ottawa  
38 on the incident. I could just give you my, you  
39 know, thinking as to why the superintendent, Don  
40 Rodden, did not agree with the recommendations.

41 The first thing that he notes is that the  
42 initial spill did not -- the impact of the spill  
43 did not -- there were no reports of impact on  
44 species birds or marine mammal fatalities  
45 attributed to the release. So that was the first  
46 thing that I'm sure he took into consideration,  
47 and the fact that there was no observable impact

1           that the diesel still had on the wildlife in the  
2           area.

3           The other thing to note is that that area,  
4           the area that the tanker truck sank in is an area  
5           of heavy traffic where discharges are -- I don't  
6           know if they're frequent, but they occur on  
7           occasion. I don't know the area too well, I'm not  
8           from there, but my understanding is that it's an  
9           area of heavy traffic, where discharges of diesel  
10          and other oils occur on occasion. And my  
11          understanding is that a monitoring plan was  
12          recommended to be implemented until no detectable  
13          hydrocarbons were found within any media, but the  
14          fact that it's a heavy traffic area and the fact  
15          that discharges do occur on occasion from vessels  
16          passing by, it was not reasonable for the polluter  
17          to implement a monitoring program to monitor for  
18          discharges of oils from the tanker truck where  
19          diesels could be discharged from vessels passing  
20          by that are not attributed to the polluter's  
21          tanker truck. So in that sense, there, it wasn't  
22          a reasonable thing for the polluter to implement  
23          at that time.

24         Q       But wasn't one of the recommendations that there  
25                 be an investigation into the tanker truck at the  
26                 bottom of the ocean, to see if, in fact, it was  
27                 empty of oil, or not, and ultimately, of course,  
28                 it was found that it was not emptied of oil? Was  
29                 that not a reasonable investigation?

30         MR. DI FRANCO: Well, Coast Guard's initial assumption  
31                 was that due to the amount of oil observed during  
32                 the onset of the incident, at that time, Coast  
33                 Guard -- and the fact that we were talking about  
34                 350 metres of depth in the ocean, it was  
35                 determined that, the Coast Guard determined that  
36                 the majority of diesel escaped during the sinking  
37                 of the tanker truck and that whatever amount of  
38                 the diesel were left on the bottom were, you know,  
39                 intact and would probably seep out over long, long  
40                 periods of time, and that any amount of seepage  
41                 that you would get from the tanker truck would  
42                 probably be undetectable.

43         Q       But this was contrary to the advice that you were  
44                 getting from DFO Science, or that Coast Guard was  
45                 getting from DFO Science through the REET; is that  
46                 right?

47         MR. DI FRANCO: Yes, according to the email, that's the

1 information, yes, that we have here.

2 Q And you've heard now some of the concerns that Dr.  
3 Ross heard, through his evidence today, and also  
4 through the documents. Do you think, in  
5 retrospect, that that incident was handled  
6 satisfactorily by Coast Guard?

7 MR. DI FRANCO: I would say yes and no.

8 Q Okay.

9 MR. DI FRANCO: Do you want me to elaborate?

10 Q I think that might be helpful.

11 MR. DI FRANCO: Well, the initial response to the  
12 incident, Coast Guard believed, I believed anyway,  
13 that the response was handled adequately. There  
14 was a spill of oil on the surface. The response  
15 organization, Burrard Clean, was contracted. They  
16 laid out some boom, they laid out some absorbent  
17 pads. My understanding is that they were barely  
18 able to pick anything up. The diesel was so  
19 dispersed and a lot of it evaporated to the point  
20 where even the absorbent pads were picking up  
21 very, very little.

22 In that regard, and the fact that the tanker  
23 truck sank at a depth of 350 metres, that the  
24 majority of the diesel did escape at the onset of  
25 the incident, and the fact that six or seven weeks  
26 after the initial incident, there were no -- there  
27 wasn't any reports of seepage coming from the  
28 tanker truck, you know, in that respect, I think  
29 the response was adequate.

30 Now, where I don't think it was adequate was  
31 the tanker truck was eventually raised from the  
32 bottom of the ocean against our recommendation.  
33 It was a joint project by DFO and the Province. I  
34 think the Province led the project, but we co-  
35 funded. The tanker truck and all the remaining  
36 containers of lube were raised from the bottom and  
37 the tanker truck was assessed to determine how  
38 much fuel was remaining in the tanker.

39 In that regard, I don't believe that that was  
40 a reasonable thing to do and the Ship Source Oil  
41 Pollution Fund also did not think that that was a  
42 reasonable operation to conduct.

43 Q Sorry, lifting the tanker from the ocean floor was  
44 not reasonable, is that what you're saying?

45 MR. DI FRANCO: Yes. Yes.

46 Q Okay. Dr. Ross, would you have had any concerns  
47 if that tanker had remained on the ocean floor and

1           gradually leaked oil over the next number of  
2           years?

3       DR. ROSS: Well, I guess it depends on what we value  
4           and, you know, I work a lot on marine mammals and  
5           we have only about 86 southern residents left, and  
6           we have, probably, 200 northern resident killer  
7           whales. So the resident killer whales in British  
8           Columbia number fewer than 300. They're listed  
9           separately under the **Species at Risk Act** at  
10          endangered and threatened. We know that pollution  
11          is a major concern. These are some of the most  
12          contaminated marine mammals on the planet, not  
13          with hydrocarbons, with persistent compounds like  
14          PCBs. And I've worked a lot with stakeholders and  
15          colleagues of mine that work on some of the other  
16          stressors or threats to these whales and, you  
17          know, when you talk to the media, you talk to the  
18          public, you talk to the whale watching sector,  
19          which is worth \$100 million a year to the B.C.  
20          economy, when you talk to kids and elderly folks  
21          and you realize just how important these killer  
22          whales are to us.

23                 So if we look at the spill that took place in  
24          what I would consider to be the most important bay  
25          for northern residents anywhere on the coast, I'd  
26          have to say that I was concerned about the fact  
27          that leaving all of this equipment at the bottom  
28          of the ocean would present a threat over the long  
29          term to **SARA**-listed northern resident killer  
30          whales.

31                 As it turned out, very little of the diesel  
32          leaked out, most of the sheen at surface was from  
33          fuel tanks of the trucks and tractors unrelated to  
34          the loading of the tanker truck, and over the  
35          seven weeks, between the incident and this email  
36          of mine, there were descriptions of strange  
37          bubbles of some kind of oil coming regularly to  
38          the surface on a daily basis and nobody was quite  
39          sure why that was, but we did find out after a  
40          matter of a number of days, if not weeks, from  
41          LeRoy Trucking that there were a number of pails  
42          with these hydraulic oils, et cetera.

43                 So hindsight is 20/20, but certainly, it was  
44          a very sensitive part of the coast, and certainly  
45          for a species of concern and for a species that  
46          relies on the salmon food web.

47       MS. BAKER: Mr. Commissioner, I wanted to take Dr. Ross

1 to the Kinder Morgan in 2007, which won't be as  
2 lengthy a series of questions as what we've just  
3 done. I don't know if you'd like me to do that  
4 now, or after the break?

5 MR. DI FRANCO: Could I say one thing --

6 MS. BAKER: Yes.

7 MR. DI FRANCO: -- regarding the Robson Bight spill?

8 The information I received regarding the tanker  
9 truck once it was raised was that two-thirds of  
10 the volume of the tanker truck had actually  
11 released during the onset of the incident and only  
12 about 3,000 litres was left in the tanker truck.  
13 As the tanker truck fell, one of the top hatches  
14 had opened up, allowing the diesel to escape and  
15 which resulted in two of the compartments flooding  
16 with water. That's why the truck didn't implode.  
17 But the rear hatch, the rear top hatch of the  
18 tanker truck remained intact, which resulted in  
19 the diesel in that tank not escaping. So that was  
20 the -- so in the end, I believe it was around  
21 3,000 litres that was left in the tanker truck and  
22 there was an engineering study. This is my  
23 understanding, that there was an engineering study  
24 conducted by UBC that looked at the tanker truck,  
25 itself, and they concluded that the rate of  
26 corrosion on a tanker truck, had it been left on  
27 the bottom, would occur over many, many, many  
28 years, and that when corrosion did start, it would  
29 create little pinhole leaks, or pinholes in the  
30 tanker truck and the diesel that would emanate  
31 from those pinholes would be virtually  
32 undetectable when it came up to the surface. I  
33 just wanted to add that little bit in there.

34 MS. BAKER: Thank you.

35 THE COMMISSIONER: Thank you, Ms. Baker. I just wanted  
36 to ask if I could just get a clarification. I  
37 didn't find it in the PPR because my eyes were  
38 going through the different paragraphs and I  
39 didn't pick it up, but with respect to whom does  
40 the Canadian Coast Guard answer to in terms of  
41 being accountable, the words that are used in the  
42 PPR are the DFO through the Canadian Coast Guard  
43 does certain things. There's also Environment  
44 Canada, Transport Canada, and the other agencies  
45 that are involved in respect to the oceans, the  
46 Pacific Ocean and the responsibilities that might  
47 flow in the event of a spill. I wonder if the

1 witness could just explain which ministry is  
2 directly responsible for the actions of the  
3 Canadian Coast Guard? What is the reporting  
4 system and just what are the allegiances with  
5 respect to these different agencies.

6 MS. BAKER:

7 Q Okay. I'll see if I can summarize, and please  
8 correct me if I'm wrong since it's hard for me to  
9 hear. The Commissioner's asked you, looking at  
10 the reporting structure for DFO and the Coast  
11 Guard, who is the Coast Guard responsible to  
12 report to, is that right, within the structure?  
13 And he's also mentioned some of the other agencies  
14 which you've referred to already, including  
15 Environment Canada, Transport Canada, and he's  
16 wondering how does the reporting structure work  
17 through up to a minister? Is that right? Mr. Di  
18 Franco, are you able to answer that?

19 MR. DI FRANCO: Yeah. Yeah, sorry. Yeah. If I can  
20 clarify, reporting structure when the spill gets  
21 reported to the Coast Guard, or during the  
22 incident as a response to its occurring?

23 THE COMMISSIONER: Well, let's start leaving aside an  
24 incident, how are these reporting structures  
25 framed?

26 MS. BAKER:

27 Q He's asking leaving aside an incident, how are the  
28 reporting structures framed?

29 MR. DI FRANCO: Okay. During a response to an  
30 incident --

31 Q He said leaving aside an incident.

32 MR. DI FRANCO: Oh, aside from an incident, just in  
33 general?

34 THE COMMISSIONER: Yes.

35 MS. BAKER:

36 Q That's right. That's right.

37 MR. DI FRANCO: Okay. Well, there's regional  
38 personnel. Within the region, it starts off with  
39 the Superintendent of Environmental Response.  
40 That person reports to the Regional Director of  
41 Maritime Safety. That person reports directly to  
42 the Assistant Commissioner, and the Assistant  
43 Commissioner is the highest ranking Coast Guard  
44 official within the region, and then that person  
45 reports to the Commissioner of the Canadian Coast  
46 Guard in Ottawa.

47 THE COMMISSIONER: I'm still not sure I understand

1           which ministry has responsibility for the Canadian  
2           Coast Guard.

3       MR. DI FRANCO: Sorry. Fisheries and Oceans. The  
4           Canadian Coast Guard is a special operating agency  
5           within the Department of Fisheries and Oceans, and  
6           the Commissioner reports to the Minister of  
7           Fisheries and Oceans.

8       THE COMMISSIONER: And which statute sets out the terms  
9           of reference for the Canadian Coast Guard and  
10          responsibilities?

11       MS. BAKER:

12       Q     In addition to --

13       MR. DI FRANCO: Well, the responsibility for the  
14           Canadian Coast Guard is laid out in the **Oceans**  
15           **Act**, in which the **Oceans Act**, s. 41, stipulates  
16           that the Minister of Fisheries and Oceans  
17           delegates certain services to the Canadian Coast  
18           Guard, and that includes icebreaking, search and  
19           rescue, marine pollution response, MCPS and so on  
20           and so on. So the main document, I guess, or the  
21           overarching document is the **Oceans Act**.

22       Q     And I think you identified that there's reporting  
23           up to the Commissioner in Ottawa, and then is  
24           there a further reporting up to the Minister, or  
25           did we just mishear you when you said  
26           "commissioner"?

27       MR. DI FRANCO: Yes, from the Commissioner and the  
28           Commissioner will report to the Deputy Minister,  
29           and then the Deputy Minister up to the Minister.

30       THE COMMISSIONER: Okay. Thank you.

31       MS. BAKER: Would you like to take the break now, then?

32       THE COMMISSIONER: Yes, that would be fine.

33       MS. BAKER: So we'll have a 10-minute break.

34       THE REGISTRAR: The hearing will now recess for 10  
35           minutes.

37                   (PROCEEDINGS ADJOURNED FOR AFTERNOON RECESS)

38                   (PROCEEDINGS RECONVENED)

40       THE REGISTRAR: The hearing is now resumed.

42       EXAMINATION IN CHIEF BY MS. BAKER, continuing:

44       Q     Thank you. I'd like to now just ask a couple of  
45           questions to you, Dr. Ross, about Kinder Morgan.  
46           Now, is Mr. Di Franco there?

47       MR. DI FRANCO: Yes, I'm here.

1 Q Okay, thank you. Dr. Ross, there was a spill in  
2 2007 in Burrard Inlet, and that was a spill from  
3 the Kinder Morgan fuel line. Was DFO Science  
4 brought in to that spill?

5 DR. ROSS: Not formally, as far as I know, no.

6 Q And, Mr. Di Franco, do you know if that was a  
7 spill that was under the responsibility of Coast  
8 Guard?

9 MR. DI FRANCO: No, it wasn't. It was a land-based  
10 spill, so it was not under the mandate of Coast  
11 Guard.

12 Q All right. Dr. Ross, were you aware of that spill  
13 or of the response to the aquatic environment in  
14 relation to that spill?

15 DR. ROSS: Coincidentally, I was in Burrard Inlet when  
16 this happened. We were there with two small craft  
17 and with my graduate students, my technician, Neil  
18 Dangerfield, and some colleagues from Simon Fraser  
19 University. So we were on team when this  
20 happened, just coincidentally, doing live captures  
21 and sampling of harbour seals for unrelated  
22 studies of pollutants.

23 Q Okay. Did you have any concerns that there may be  
24 issues relevant to anadromous fish or fish habitat  
25 in relation to the spill in Burrard Inlet?

26 DR. ROSS: Well, we saw the booms out. We saw a  
27 shoreline that was completely oiled. I believe  
28 there were 240,000 litres of crude oil that  
29 escaped. Much of that went into the local marine  
30 environment. We saw probably 200 white-suited  
31 either volunteers or paid contractors on the shore  
32 with absorbent pads. We saw thick oil and sheens  
33 within the boom and also outside the booms.

34 We went ahead, while I was on my phone trying  
35 to secure insight and advice from some of my  
36 colleagues who were more implicitly involved in  
37 the incident command, but we went ahead with our  
38 own work and we were live-capturing seals and  
39 young seals, and we captured one young harbour  
40 seal, probably four weeks old, who was 50 percent  
41 covered in oil. This would have been right at the  
42 end of Moody Arm, probably a full five kilometres  
43 from the spill site.

44 At the time, I was deciding whether I should  
45 take this harbour seal over to the Vancouver  
46 Aquarium Marine Mammal Rescue Unit, because they  
47 deal with either orphaned or sick injured seals,

1 but I decided that the seal was in good shape and  
2 was still nursing with its mother, who was nearby,  
3 and so we cleaned off the seal and released it.

4 So obviously I did have some first-hand  
5 concerns and observations that biota were being  
6 impacted.

7 Q And was there an avenue for that Science advice  
8 that you or your group would have been able to  
9 assist with their -- to get that advice to the  
10 people doing the cleanup?

11 DR. ROSS: There was no avenue for me to provide direct  
12 advice other than me phoning colleagues at  
13 Habitat, Mr. Corino (sic), and that was probably  
14 it. It's difficult to deal with communications  
15 when you're in the field, but there was no formal  
16 way for me to provide my advice.

17 Q And ultimately was Science advice contributed to  
18 develop a monitoring plan or to develop a cleanup  
19 plan for that spill?

20 DR. ROSS: The contracting party - and I can't remember  
21 the name of the consulting firm - sent out a  
22 representative with us where I pointed out one of  
23 the adult harbour seals who was completely oiled  
24 and was suffering from distress and looked as  
25 though he had fairly extensive eye irritations. I  
26 indicated it would be very difficult to capture  
27 that adult, it was a large male, and he was on a  
28 rock. But I did offer to, or suggest, that we  
29 could capture seals nearby and take blood samples  
30 and/or other samples in a minimally invasive  
31 manner in support of understanding whether  
32 hydrocarbons were being ingested.

33 I also did suggest, because we did have a  
34 small sediment grab sample that we can just drop  
35 off the side of the boat to grab surficial  
36 sediments, so I offered to collect these sediment  
37 samples and water samples to this contracting  
38 party and this advice was also relayed via Mr.  
39 Corino.

40 Q Corino Salomi?

41 DR. ROSS: Salomi Corino (sic) at our DFO Habitat  
42 branch.

43 Q And was that offer taken up by the cleanup crew?

44 DR. ROSS: No.

45 Q I'd like to take you to an email that is in the  
46 materials at Tab 10. It has another one of these  
47 chains of emails, so I'd like to go to the back,

1 the very first email in that exchange, which is in  
2 fact an email from Mr. Salomi, who you were  
3 referring to there, and he has written an email  
4 here to you, Mr. Reid, and others. I think, Dr.  
5 Ross, you're copied on this email, and he says  
6 that:

7  
8 This week's oil spill in Burrard Inlet has  
9 highlighted the need for DFO to update its  
10 role during major pollution events. I  
11 understand that this has been raised by  
12 others recently as well. The following text  
13 which I previously drafted with input from  
14 Karen Hutton could provide the basis for a  
15 regional discussion or briefing.  
16

17 And then he sets out some language identifying  
18 things such as DFO's involvement being initiated  
19 through Environment Canada, through an Area  
20 Director and through DFO -- excuse me.  
21

22 From Environment Canada contracting an area  
23 director through to an area chief, and then  
24 the area biologist.  
25

26 From the second paragraph. And he has a concern  
27 that:

28  
29 ...area biologists are generally able to  
30 provide information on fish and habitat in a  
31 given area, but most staff are not familiar  
32 enough with oil or chemical spill impacts,  
33 contaminant (sic) [containment], or clean-up  
34 techniques to give practical or effective  
35 support.  
36

37 And so he says there is a regional meeting of  
38 spill response agencies coming up where these  
39 issues should be talked about and determined.

40 The bottom paragraph says:

41  
42 The Department's current spill response  
43 support capacity is limited and the  
44 Department's expectations of area staff's  
45 role in spill events needs to be clarified.  
46

47 Et cetera.

1                   Now, Dr. Ross, there's an email from you that  
2 just follows this where you agree with his  
3 comments. Do you see that? That's on the second  
4 page. It says:

5  
6                   Hi Corino-

7  
8                   As discussed last week by phone, I share your  
9 concerns about DFO's role in incidents such  
10 as oil spills. I think the department is  
11 vulnerable on both the assessment (including  
12 Science advice) and the enforcement sides, as  
13 EC is not in a logistical or intellectual  
14 position to comprehensively address the  
15 marine fish/marine mammal habitat aspects.  
16

17                   That is your email; is that right?

18 DR. ROSS: That's correct.

19 Q                   And that remains your view?

20 DR. ROSS: Well, I was simply offering to assist, if I  
21 could, and I guess I felt professionally that DFO  
22 was potentially facing some criticism if any of  
23 these shortcomings did emerge in the media. I  
24 thought it was my responsibility to raise these  
25 concerns. And obviously if I'm raising concerns,  
26 to try to proffer some constructive input.

27                   We had just -- and this perhaps comes in the  
28 trailing path of our program review for s. 36 and  
29 DFO's toxichemical program which had essentially  
30 been axed prior to this. So we felt a little bit  
31 orphaned on the contaminant side, and that's not  
32 always fun. But, at the same time, whether it's  
33 DFO's responsibility or Environment Canada's  
34 responsibility, I guess I felt that somebody has  
35 to step in and do this kind of work, whether it's  
36 from research perspective or monitoring  
37 perspective, and we lacked clarity on who that  
38 should be.

39 Q                   And that was something you felt needed to be  
40 sorted out, clarified?

41 DR. ROSS: Yes.

42 Q                   And, then, Mr. Reid, following Dr. Ross's email,  
43 there's an email from you which now, if we turn to  
44 the very front page of this chain, you'll see it  
45 at the bottom. It's from you to Kirsten Ruecker,  
46 and you say:  
47

1                   To improve everyone's understanding of "who  
2                   does what" during a spill incident, I have  
3                   been asked to prepare a brief summary of  
4                   DFO's Pacific "current" roles and  
5                   responsibilities for spill incidents (both  
6                   marine and freshwater spills).  
7

8                   I just wanted to ask you, first of all, you  
9                   remember seeing this email chain?

10                  MR. REID: Yes, I do recall this chain.

11                  Q     And at the very, very top message on this email  
12                        chain is again from Dr. Ross, and he asks in the  
13                        very last line:  
14

15                        Is there an appetite for OHEB to write a  
16                        Briefing Note that encapsulates 4-5  
17                        incidents, what we learned, how DFO was  
18                        'vulnerable' in terms of media/legal, and  
19                        where we should go?  
20

21                        So I'm just going to ask you overall did you take  
22                        these steps? Did you sort out who does what  
23                        during a spill incident? Did you prepare a  
24                        briefing note? What was the response to the  
25                        concerns that are articulated by Dr. Ross and  
26                        Corino Salomi in this email chain?

27                  MR. REID: Yeah, so my role at that time was as  
28                        Regional Manager of our Habitat Program, and so  
29                        the first thing that we did when seeing this  
30                        incident is actually spend a little time with some  
31                        of my staff discussing what our role was. This  
32                        actually eventually led to one of my staff  
33                        preparing a deck which actually talks about the  
34                        different roles DFO has during a spill event.

35                        There's different programs within DFO.  
36                        There's our OHEB, which is the Ocean Habitat  
37                        Enhancement Branch. There's our Fisheries  
38                        Management. There's the Conservation and  
39                        Protection, and there's our Science groups, who  
40                        all may have different roles during a spill.

41                        So this eventually led to me providing a  
42                        presentation to managers, other OHEB managers  
43                        regarding a proposed role or confirming our role  
44                        in response to spills in this event.

45                        Dr. Ross did refer to a change in DFO's  
46                        program in, I think, around 2004/2005. I had  
47                        another job at the time, but we used to have a

1 Water Quality Unit within our Habitat Program that  
2 provided that support during a spill. That  
3 program was changed to support physical habitat as  
4 well as another program to do with federal  
5 contaminated sites. So that expertise was no  
6 longer available.

7 So some of the comments in this email are  
8 frustrations around a change that occurred in  
9 around 2004/2005 and a change to how do we respond  
10 now in a different regime?

11 MS. BAKER: Could I have this --

12 Q Sorry, have you finished? Thank you.

13 MS. BAKER: Could I have this email chain marked as the  
14 next exhibit, please?

15 THE REGISTRAR: Exhibit 1377, counsel.

16  
17 EXHIBIT 1377: Email chain re "DFO and  
18 Pollution response/support"  
19

20 MS. BAKER:

21 Q And I will take you to a presentation which I  
22 think you're referring to, but before I do that, I  
23 would just like to turn to Tab 14 of the  
24 Commission's list. This is another email from  
25 you, Dr. Ross, and I just want to go down to the  
26 bottom. You're writing to Corino Salomi again, at  
27 the bottom of the first page.

28  
29 The spills continue...!

30  
31 I am not a crab expert...  
32

33 And you go on to discuss some recent concerns.  
34 And then at the first paragraph at the end, you  
35 say:  
36

37 Over the last 3.5 years, DFO viewed EC as the  
38 lead agency, but as we have seen, there has  
39 been little capacity or interest on EC's part  
40 to adopt this role.  
41

42 And that is with respect to marine impacts and  
43 monitoring; is that right?

44 DR. ROSS: That would be correct.

45 Q Okay. And does that remain a concern of yours?

46 DR. ROSS: This remains a profound concern of mine,  
47 yes.

89  
PANEL NO. 53  
In chief by Ms. Baker

1 MS. BAKER: I'll have that marked, please.  
2 THE REGISTRAR: Exhibit 1378.

3  
4 EXHIBIT 1378: Email chain re "Further to  
5 Jeff Marliave's report of dead and moribund  
6 crabs"  
7

8 MS. BAKER:

9 Q And, Mr. Reid, if I could ask you to turn to Tab  
10 39. This is a Powerpoint presentation, "Spill  
11 Incident and Response, OHEB's Role". It's dated  
12 December 6, 2007, which just follows the email  
13 that we've been looking at. Is this the deck that  
14 you were referring to?

15 MR. ROSS: That is correct.

16 MS. BAKER: I'll have that marked, please, as the next  
17 exhibit.

18 THE REGISTRAR: Exhibit 1379.

19  
20 EXHIBIT 1379: Powerpoint presentation titled  
21 "Spill Incident and Response, OHEB's Role"  
22 dated December 6, 2007  
23

24 MS. BAKER:

25 Q I'd like to just turn to page 7 of this.  
26 Unfortunately the pages aren't numbered, so we're  
27 going to have to hope that the Powerpoint numbers  
28 work. So at the top here, it says:

29  
30 If DFO does not have a strong presence on  
31 REET, DFO resources (fish and fish habitat)  
32 are unlikely to properly identified,  
33 protected, assessed and monitored.  
34

35 I'd like to ask both Dr. Ross and Mr. Reid if that  
36 is something that you agree with, that statement?

37 DR. ROSS: I most certainly agree with the statement,  
38 and I feel as though many of the experts, both in  
39 Habitat and within Science, as well as obviously  
40 Coast Guard, which I presume is excluded from this  
41 statement, there's an abundance of expertise  
42 within the agency we know as Fisheries and Oceans  
43 Canada, to participate and contribute to an  
44 effective REET, and to help to mitigate impacts on  
45 natural resources, and also to help guide cleanups  
46 and potentially also to support enforcement or the  
47 pursuit of charges.

August 17, 2011

1 Q And, Mr. Reid, do you agree with that as well?  
2 MR. REID: Yeah, I agree with the statement. I think  
3 the key word is "properly identified". I think in  
4 the absence of DFO advice, there likely would be  
5 some effort to identify, but they may not be  
6 properly identified.

7 Q Can you turn to the next page, the next two pages.  
8 I'll start with page 8. So this has a "Spill  
9 Response" flow chart, I guess, and it follows over  
10 onto the following page, page 9, and sets out the  
11 Area Director responsibility for REET. I wanted  
12 to just confirm whether that approach was  
13 discussed with the managers and whether that was  
14 accepted by them?

15 MR. REID: This particular presentation, I gave to --  
16 actually one of my staff gave to other OHEG  
17 managers that are in five different areas around  
18 the province, and my recollection was that they  
19 supported the approach of having the Area Director  
20 as the first point of contact in the event of a  
21 spill when a REET is formed. The reasons for that  
22 are that the Area Director has authority to engage  
23 staff in a local area, local office, that can  
24 deploy Habitat biologists to do some surveys of  
25 beaches. They can deploy -- they can close  
26 fisheries in the event that a fishery is taking  
27 place and there's a spill event. They also have  
28 local knowledge as well.

29 Q And then the next page, the page that's on the  
30 screen right now at the very bottom, it says:

31  
32 Recommend OHEB RHQ provide coordinator to  
33 address the above issues, for the interim.  
34

35 Did that happen? Is there a person in DFO who  
36 coordinates the DFO response to each spill?

37 MR. REID: There presently is no specific individual  
38 who's been identified to coordinate on behalf of  
39 DFO or within the OHEB, now called Ecosystems  
40 Management Branch.

41 Q Has this flow chart that we just looked at, and  
42 the recommendations on the following page, have  
43 those been approved or adopted in any way, or are  
44 they simply a presentation that you made?

45 MR. REID: The approach was discussed with the Regional  
46 Director who was my direct report at the time, and  
47 my recollection was generally supported. I'm not

1           sure who she discussed beyond that, though.  
2       Q     On the very last page of this document, there's a  
3           heading "Next Steps". It says:

- 4  
5           • Finalize procedure  
6           • Discuss with Regional Director [RG]  
7           • Discuss with Area Directors  
8           • Advise RDG  
9

10           Did those steps happen? Has that been  
11           implemented?

12       MR. REID: As I mentioned, I recall discussing the  
13           procedure with Regional Director. My  
14           understanding is she had some discussions with  
15           Area Directors. I'm not able to speak on whether  
16           she discussed this particular procedure with the  
17           Regional Director General.

18       Q     All right. If it had gone to the Regional  
19           Director General, would there be a decision memo  
20           with procedures attached that would come back and  
21           inform you a decision had been made?

22       MR. REID: Normally that would be the case. What I can  
23           say is that the Regional Director General at the  
24           time of the Robson Bight spill was being advised  
25           of the REET process, and I also know in 2009,  
26           Environment Canada actually gave a presentation to  
27           our Regional Management Committee, which is made  
28           up of all the Regional Directors chaired by the  
29           Regional Director General, about REET.

30           Also currently there are discussions between  
31           DFO directors and Environment Canada directors  
32           just to confirm the role of DFO and REET. They're  
33           happening right now.

34       Q     Do you know if Environment Canada has ever  
35           confirmed its understanding of this process? Has  
36           there been that next layer of communication where  
37           DFO and Environment Canada get on the same page  
38           with who is doing what on a spill?

39       MR. REID: I believe there's been some informal  
40           discussions and there are some discussions planned  
41           in the near future, I think in September.

42       Q     I'd like to move to another topic. This is marine  
43           contaminates. Now, Dr. Ross, we've had evidence  
44           in this inquiry on freshwater contaminants and on  
45           different contaminant impacts, so we might be able  
46           to move fairly quickly through this. What I'd  
47           like to ask you is whether the marine environment

1           can be affected by chronic low level releases of  
2           contaminants?

3       DR. ROSS: Yes. Certainly we know from extensive  
4       research, both in British Columbia, Washington  
5       State and internationally, that organisms, fish  
6       and invertebrates and marine mammals indeed living  
7       near urban centres or near major industrial sites  
8       often have higher levels of a variety of nasty  
9       chemicals, and we also see affects on their health  
10       in different ways. We have probably 20 papers and  
11       publications from Puget Sound showing that  
12       resident non-migrating fish have an abundance of  
13       liver tumours and skin lesions, and this would be  
14       associated with PCBs and hydrocarbons in urban  
15       centres.

16           So we know that marine pollutants are a  
17       problem in certainly both our areas, and we  
18       certainly know as sockeye would be leaving the  
19       Fraser estuary, they still have to navigate marine  
20       waters which are the receiving end of numerous  
21       important point sources of environmental  
22       contaminants.

23           I would certainly note major pulp mills. We  
24       know from history of scientific research and  
25       monitoring there that dioxins and furans were a  
26       major problem and have resulted -- from pulp  
27       mills. We've since rectified that with pulp mill  
28       regulations. But the presence of high levels of  
29       dioxins continues to result in the closure of as  
30       much as 1200 hectares of commercial fishing in  
31       areas of the B.C. coast.

32           So we know that there are important sources  
33       of nasty contaminants that are of concern to biota  
34       and to humans. If we look at the coastline, we've  
35       got major sewage outfalls.

36           I note that the interest in the **Oceans Act**  
37       and the Pacific North Coast Integrated Management  
38       Area, we did a survey of contaminant sources in  
39       the PNCIMA area, and that stretches from  
40       essentially the Alaska border down to Campbell  
41       River. It's most of our coastline. Human  
42       population is 130,000. We estimated in 2004 in  
43       our paper that 1.5 million cruise ship passengers  
44       transit those waters, and those cruise ships will  
45       be releasing a lot of domestic sewage and all the  
46       pharmaceuticals used by the persons on board and a  
47       number of other contaminants.

1           So we know there are a lot of contaminants  
2 being released into marine waters along the  
3 coastline of British Columbia. But we also know  
4 that salmonids head to sea, feed and grow out in  
5 the pasture we know is the North Pacific Ocean,  
6 and relying on the food web in such a remote area,  
7 they still accumulate notable concentrations of  
8 persistent contaminants such as PCBs, DDT,  
9 endosulfan, PBDEs, etc. Probably the majority of  
10 these contaminants would be deposited into the  
11 North Pacific from Asian sources.

12           We published a paper in 2007 that estimated  
13 that as much as 40 percent of the PBDEs in the  
14 British Columbia coastal air are coming from Asia.  
15 It would only take seven to ten days for those  
16 contaminants to get to our coastline.

17           So we know that salmonids are exposed to  
18 global pollutants through their time at sea, and  
19 that they bring these back with them. And as they  
20 head back into the freshwater environment, they're  
21 burning off their fat, they're heading upstream,  
22 these chemicals are found in the remaining  
23 reserves of fat at concentrations that are  
24 increasing as they burn off fat, because we're  
25 getting persistent chemicals remaining behind in a  
26 dwindling reserve of fat. That becomes a  
27 biological concern or of concern to the health of  
28 the returning sockeye and the eggs they lay back  
29 in their natal stream.

30 Q       Is there any current research being conducted on  
31 marine contaminants that could affect Fraser River  
32 sockeye by DFO Science?

33 DR. ROSS: We have published a couple of papers, and  
34 colleagues of mine, Michael Ikonomou and others,  
35 Rob Macdonald, all three of us have published  
36 separate papers on what we would term the  
37 biological importation of persistent contaminants  
38 by salmon into freshwater ecosystem.

39 Q       Is that current work that's being done?

40 DR. ROSS: No, these are all published.

41 Q       Is there any current work being done?

42 DR. ROSS: No, there is no funding available to us to  
43 continue any work on salmon, other than a small  
44 program I have in collaboration with Chris Kennedy  
45 at Simon Fraser University looking at the effect  
46 of the single pesticide exposures to salmon.

47 Q       Ecosystem management has been identified by the

1 approach taken by the DFO Science in its work.  
2 Are contaminants in the marine environment  
3 relevant to an ecosystem approach?

4 DR. ROSS: Well, personally, I would consider  
5 environmental contaminants to be one of the  
6 priorities on a global scale. If we look at any  
7 other jurisdiction, including the United States,  
8 marine pollution is considered usually in the top  
9 four of threats in the marine environment, so I  
10 would consider environmental contaminants to be an  
11 important component of marine environmental  
12 quality as we look at the environment, or as an  
13 important component of ecosystem-based management,  
14 yes.

15 Q Today we've had marked as Exhibit 1371 which is an  
16 updated briefing note, 2011, on the 2009 Fraser  
17 sockeye return. Have you seen that document  
18 before?

19 DR. ROSS: The first time I saw it was during my  
20 testimony on June 14th, for the wastewater  
21 hearings.

22 Q Okay. At page 3 of this document -- there, stop  
23 there. Maybe I've got this wrong. Sorry,  
24 further, page 2 of the memo so it would be one  
25 page earlier. There.

26 Under the first bullet underneath "Analysis  
27 and DFO Comment", it says:

28  
29 Based on the most recent analyses, the  
30 following factors are unlikely to have  
31 contributed to the poor 2009 return.  
32

33 And they identify pollution and contaminants in  
34 the Fraser River, so that's the first point. Do  
35 you agree with that?

36 DR. ROSS: No, I do not.

37 Q Okay. Then what about marine contaminants -- that  
38 doesn't seem to be in this memo anywhere. We've  
39 got Fraser river contaminants, but what about  
40 contaminants in the marine environment? Has that  
41 hypothesis ever been considered by DFO Science?

42 DR. ROSS: Well, certainly I was a participant at some  
43 of the workshops over the years, including the  
44 late-run sockeye crisis in the late 1990s, and we  
45 explored a number of different hypotheses where  
46 pollutants might have played a role in either  
47 acutely harming sockeye salmon, or indirectly

1           harming them in a developmental sense.

2           A lot of the chemicals of concern today will  
3 not result in a belly-up incident with a major  
4 fish kill. A lot of the pollutants that we have  
5 out there will result in chronic exposures, low-  
6 level effects, developmental anomalies which  
7 essentially contribute to weakening the fish,  
8 whether it's a fish that is heading out to sea  
9 with an immune system that is vulnerable to this  
10 kind of toxicity or behaviour or olfaction or  
11 energetics. A lot of the endocrine disrupting  
12 pollutants that we think of today, including the  
13 persistent chemicals, including a lot of hormones,  
14 including a lot of pharmaceuticals, are ones that  
15 can cause and affect well beyond the time of  
16 exposure.

17       Q       Where would you prioritize research on marine  
18           contaminants today?

19       DR. ROSS: Where would I prioritize them?

20       Q       Yeah. Like how would you -- I take it you would  
21           agree that more research needs to be done on  
22           marine contaminants. How would you prioritize  
23           that work that needs to be done?

24       DR. ROSS: Well, I would compare with a lot of the  
25           other global assessments, either through the  
26           United Nations Environment Program or NOAA, that  
27           pollution is a major threat to the biota for which  
28           we have a responsibility to manage in the ocean.  
29           I'm a toxicologist. I would be self-serving to  
30           suggest further, but I am in the business of  
31           trying to figure out which contaminants we should  
32           be worried about out of the 25,000-odd chemicals  
33           in Canada and the 80,000 medicinal compounds.

34           I guess I'd have to admit that I do not feel  
35           as though I have the tools to be able to offer as  
36           much insight as I would like to be able to offer  
37           at these hearings, and I think, personally, it is  
38           very important for Canada to decide how it will  
39           support or navigate the whole question of  
40           research, monitoring and enforcement of  
41           environmental contaminants in the marine  
42           environment.

43       Q       All right. And if I could just ask you to  
44           identify Exhibit 1364 as the summary report from  
45           the "DFO Synthesis Workshop" in April of this  
46           year, and on page 6 of that document, "Information  
47           and Research Needs" are set out under a heading,

1 "Contaminants - Peter Ross", and I take it you  
2 would adopt that or confirm those research needs  
3 still?

4 DR. ROSS: I haven't seen this in a while, but I'm sure  
5 I drafted this. You know, I can make  
6 recommendations and I think it's important to look  
7 at these, and the Macdonald report, number 2, for  
8 your Commission also made a number of excellent  
9 recommendations. And I think both of us would  
10 strongly agree with the fact that we're in a very  
11 poor position to be able to rule out contaminants.  
12 An absence of data, or an absence of evidence to  
13 me is not evidence of absence, and I think it's a  
14 little bit dangerous to use an absence of data or  
15 an absence of evidence to suggest that  
16 contaminants play no role whatsoever or are indeed  
17 unlikely to play a role.

18 I think it gives short shrift to the examples  
19 we have from other parts of Canada with salmon  
20 that have been dramatically impacted by acid rain  
21 in Eastern Canada, and aluminum and copper and  
22 pesticides in New Brunswick. It gives short  
23 shrift to the evidence we have from our  
24 colleagues, our federal colleagues to the south of  
25 us where we see chinook salmon returning to Puget  
26 Sound that are being affected by urban  
27 contaminants.

28 So these are some specific examples. Other  
29 scientists, other toxicologists might have a  
30 slightly different view, but clearly we're data-  
31 deficient in terms of our current capacity to  
32 understand what's happening with the sockeye  
33 situation.

34 Q Thank you. My last question is for you, Mr. Reid,  
35 and it's the question referencing document at Tab  
36 25 of the commission's brief. It's a document  
37 entitled "Canada's Ocean Strategy" and it's from  
38 2006. There's just one question I wanted to ask  
39 you out of this document. On page 23, which would  
40 be a little bit further down there, the paragraph  
41 I want to take you to is under "Conservation and  
42 Protection of Marine Environment" and I just want  
43 to ask you, it says under the third point here [as  
44 read]:

45  
46 Establish and implement a marine  
47 environmental quality policy and operational

1 framework under the *Oceans Act*...

2

3 Has that happened? Has a marine environmental  
4 quality policy and operational framework been  
5 developed?

6 MR. REID: No, it has not been developed.

7 Q And why not?

8 MR. REID: I gather when the people started analyzing  
9 how to develop a marine environmental quality  
10 policy framework - I wasn't actually in the Oceans  
11 program at the time, so this is what I've been  
12 advised - that they realized that before they  
13 could actually come up with a policy and  
14 operational framework, they really had to come up  
15 with tools to describe the ecosystem, and so there  
16 was an evolution or a shift from actually focusing  
17 work on developing REET environmental quality  
18 policy framework to actually describing  
19 ecosystems, marine ecosystems in the country. So  
20 tools that were -- documents that were produced  
21 that included ecosystem overview assessments,  
22 there was documents that described ecologically  
23 and biologically sensitive areas as well as there  
24 was some seabed mapping work done, as well as work  
25 to -- what I call ecosystem approach, or ecosystem  
26 objectives or conservation objectives.  
27 Essentially those are describing a specific  
28 environment and what you were trying to achieve by  
29 sustaining that particular feature.

30 So there was a shift, and as a consequence,  
31 there was never a policy of operational framework  
32 completed.

33 MS. BAKER: Mr. Commissioner, we have a lot to cover  
34 tomorrow. I don't know if there's any opportunity  
35 to stay for a little bit and let Canada start  
36 their cross-examination of these witnesses for ten  
37 minutes even.

38 THE COMMISSIONER: I think we could do ten minutes, but  
39 that would be max.

40 MS. BAKER: Okay. Thank you.

41 MR. TIMBERG: It's Tim Timberg with Geneva Grande-  
42 McNeill for Canada.

43

44 CROSS-EXAMINATION BY MR. TIMBERG:

45

46 Q Mr. Di Franco, I have a few questions for  
47 yourself. Can you hear me?

1 MR. DI FRANCO: Yes, go ahead.

2 Q Thank you. We've heard about -- we discussed  
3 today from large-scale incidents like those at  
4 Robson Bight and Burrard Inlet. Can you give us a  
5 background on how frequent those large-scale  
6 incidents are as compared to smaller spills?

7 MR. DI FRANCO: Well, like I've mentioned earlier in  
8 the day, the larger scale incidents that you see,  
9 Robson Bight, Squamish Terminals or Burrard Inlet,  
10 those are -- those are fairly rare compared to the  
11 other spills that we deal with.

12 The Pacific Region reports approximately 600  
13 marine pollution incidents a year, and the  
14 majority of those are small, you know, tiny, small  
15 insignificant incidents. The occurrence of larger  
16 incidents are very rare, I would say, perhaps one,  
17 maybe two, a year is my experience of what I've  
18 seen on the west coast.

19 Q Thank you. We've talked about or heard a lot of  
20 evidence about the scientific and technical advice  
21 that the REET provides to the Coast Guard when the  
22 REET is activated. Can you tell us what expertise  
23 of its own does the Coast Guard bring to bear in  
24 response to a spill?

25 MR. DI FRANCO: Well, the Coast Guard will bring a  
26 variety of expertise to a marine pollution  
27 incident. Basically what the Coast Guard brings  
28 is, in a nutshell, operational experience,  
29 response management, technical experience,  
30 logistical experience, public relations, liaison  
31 function with the public and other stakeholders.

32 Members of the Canadian Coast Guard have  
33 many, many years of experience in dealing with  
34 marine pollution incidents and a lot of our  
35 members spend their entire careers with  
36 environmental response, so they have extensive  
37 experience in dealing with marine pollution  
38 incidents, so there's a wide variety of expertise  
39 that pertain -- Coast Guard brings to a spill,  
40 including, as well, experience in dealing with  
41 polluters. Some of them can be hostile, some of  
42 them not so hostile. The Canadian Coast Guard has  
43 a lot of experience in knowing how to deal with  
44 individuals of all stripes.

45 Q Thank you. And can you tell us whether there are  
46 any structural advantages to having Canadian Coast  
47 Guard as a first responder?

1 MR. DI FRANCO: Well, the Coast Guard, because we've  
2 been around for so long, especially among the  
3 response division -- we're set up like a response  
4 organization, so there's a notification system.  
5 There's a 1-800 number established. We have duty  
6 officers that are on call 24-7. We have  
7 approximately a staff of 75 individuals across the  
8 country that are within the environmental response  
9 program. We have approximately 80 response  
10 equipment depot sites strategically located across  
11 the country and which can be cascaded to any  
12 region if a significant spill were to occur.

13 We have the vessel support, logistical  
14 support, air support, great liaison relationships  
15 with other departments including Transport Canada,  
16 Environment Canada and public safety. And, of  
17 course, the experience that our personnel have  
18 within the regions is also a great asset.

19 MR. TIMBERG: Thank you. And if, Mr. Registrar, we can  
20 turn to Canada's Tab 1, which is the National  
21 Contingency Plan.

22 Q I'm wondering, Mr. Di Franco, do you have this in  
23 front of you, the "Canadian Coast Guard  
24 Environmental Response, Marine Spills Contingency  
25 Plan"?

26 MR. DI FRANCO: Yes, I do, now I do.

27 Q Okay, thank you. And can you explain what this  
28 document does, who created it and what it sets out  
29 to explain?

30 MR. DI FRANCO: Well, the National Marine Spills  
31 Contingency Plan, the national chapter is  
32 basically the framework or the guideline -- the  
33 guidelines through which the Canadian Coast Guard  
34 operates or uses when it responds to a marine  
35 pollution incident. It explains the how, where,  
36 when, why of marine pollution response with  
37 respect to the Coast Guard.

38 This document was written at headquarters and  
39 it is entitled, "The National Chapter", and within  
40 the national chapter there are regional chapters,  
41 Pacific, Central, Arctic, Maritimes, Quebec and  
42 Newfoundland regional chapters which further  
43 details how the Canadian Coast Guard will  
44 implement the operational aspects of a response to  
45 a marine pollution incident. This document  
46 basically is our Bible and lays out the  
47 legislative framework, our mandate for doing what

1 we do. It explains the types of spills that we  
2 respond to, the ones that we're lead agency, the  
3 ones where we're not lead agency, and the ones  
4 where we're resource agency where we can provide  
5 resources to another lead agency. It explains the  
6 geographic area of response that we cover.

7 Q Okay. So we can use that document.

8 MR. DI FRANCO: Yes, totally.

9 Q Thank you. All right. Dr. Ross, I have some  
10 questions for yourself.

11 MR. TIMBERG: And if we could turn, Mr. Registrar, to  
12 Canada's Tab 46, and if we could have that, before  
13 we move on, thank you, if we could have the  
14 Canadian Coast Guard Environmental Response marked  
15 as the next exhibit.

16 THE REGISTRAR: It will be marked as 1380.

17

18 EXHIBIT 1380: Document titled "Canadian  
19 Coast Guard Environmental Response"  
20

21 MR. TIMBERG: Thank you.

22 Q Dr. Ross, could you identify what this document  
23 is?

24 DR. ROSS: Yes, I believe this was a presentation that  
25 I gave to a DFO Science workshop this spring of  
26 2011.

27 Q Okay. And what was the purpose of that workshop  
28 this spring?

29 DR. ROSS: That was part of DFO's internal scientific  
30 efforts to sort of collate all the available  
31 expertise to try to determine some of the factors  
32 that may have been underlying the decline of  
33 Fraser sockeye over a decadal time span, or a  
34 couple of decades, as well as the disastrous 2009  
35 return.

36 This presentation drew on the collective  
37 experience of a number of parties, colleagues from  
38 Simon Fraser University with whom we'd been  
39 collaborating on the effects of pesticides,  
40 currently used pesticides on a variety of salmon  
41 species, colleagues who work on biology and  
42 ecology of Fraser River sockeye salmon, and Wayne  
43 Fairchild, who is an expert on the east coast who  
44 is the lead in identifying a forest-applied  
45 pesticide as responsible for the loss of millions  
46 of returning Atlantic salmon in a series of papers  
47 over the last ten or 12 years.

1                   So, really, this was just an attempt to  
2                   collate available information in a risk-assessment  
3                   habitat paradigm in support of our understanding  
4                   sockeye.

5           Q       And just so we're clear on the record, this was  
6                   the presentation that followed up on the Pacific  
7                   Salmon Commission meeting in June of 2010 on the  
8                   various possible causes of decline of Fraser River  
9                   sockeye salmon.

10          DR. ROSS: This would be a follow up. I was not  
11                   present at that Pacific Salmon Commission meeting.

12          Q       But you provided this presentation at the follow-  
13                   up meeting?

14          DR. ROSS: Yes, that's correct.

15          Q       And how was this presentation relevant to Fraser  
16                   River sockeye salmon and marine waters?

17          DR. ROSS: Well, one of the concerns that I retain with  
18                   regard to Fraser River sockeye is this notion that  
19                   continues to be put forth at some of our workshops  
20                   and elsewhere that what we expect to find are  
21                   hundreds, if not thousands of belly-up fish in a  
22                   lake or beside a pulp mill or in the Strait of  
23                   Georgia that would give us evidence that a  
24                   pollution spill might have been a causal factor or  
25                   driver of what we've been observing.

26                   Although this is not to be discounted, it is  
27                   indeed possible that a single point source or a  
28                   single chemical could have and has, upon occasion,  
29                   contributed to such events, that's clearly not the  
30                   norm. In fact, a lot of the chemicals that we use  
31                   today are ones that don't dissolve in water, that  
32                   are persistent, they get in the food webs, that  
33                   are not acute poisons. A lot of these same  
34                   chemicals we would find are now in bodies.  
35                   They're not killing us outright, but we remain  
36                   fundamentally concerned and we tried to express  
37                   that in this paper, that Fraser River sockeye have  
38                   to run by a gauntlet of point sources and they're  
39                   exposed to a lifetime of exposures with many of  
40                   these contaminants being accumulated in their  
41                   tissues, not being eliminated. And we raise the  
42                   concern based on an abundance of literature from  
43                   elsewhere, that we may be sending very small  
44                   Fraser River sockeye smolts to sea weakened, not  
45                   in tiptop shape, perhaps predisposed to disease,  
46                   perhaps predisposed to slight behavioural  
47                   anomalies, predisposed to not being able to smell

1 quite properly. All of these things are very,  
2 very important to the salmon that have to navigate  
3 this lengthy corridor, head out to sea and then  
4 come back and find their natal stream.

5 So we do remain concerned that there may be  
6 long-term insidious effects of a number of  
7 different contaminants that may simply weaken the  
8 fish in the face of a disease that comes along or  
9 a parasite or climate stress, and contribute to  
10 the cumulative impacts of the population level.

11 MR. TIMBERG: Thank you. Mr. Commissioner, we'll go  
12 through his workshop tomorrow morning.

13 THE COMMISSIONER: Thank you very much, Mr. Timberg.

14 THE REGISTRAR: Did you wish that last document marked?

15 MR. TIMBERG: If we could. Thank you.

16 THE REGISTRAR: That will be marked as Exhibit 1381.

17  
18 EXHIBIT 1381: Presentation titled "Salmon  
19 are Sensitive: Life history, habitat and  
20 contaminants"  
21

22 THE REGISTRAR: The hearing is now adjourned for the  
23 day and will resume at ten o'clock tomorrow  
24 morning.  
25

26 (PROCEEDINGS ADJOURNED AT 4:10 P.M. TO AUGUST  
27 18, 2011 AT 10:00 A.M.)  
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31  
32

33 I HEREBY CERTIFY the foregoing to be a true  
34 and accurate transcript of the evidence  
35 recorded on a sound recording apparatus,  
36 transcribed to the best of my skill and  
37 ability, and in accordance with applicable  
38 standards.  
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I HEREBY CERTIFY the foregoing to be a true and accurate transcript of the evidence recorded on a sound recording apparatus, transcribed to the best of my skill and ability, and in accordance with applicable standards.

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Irene Lim

I HEREBY CERTIFY the foregoing to be a true and accurate transcript of the evidence recorded on a sound recording apparatus, transcribed to the best of my skill and ability, and in accordance with applicable standards.

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Diane Rochfort