

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, June 15, 2011

**Tenue à :**

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

le mercredi 15 juin 2011



### Errata for the Transcript of Hearings on June 15, 2011

Page	Line	Error	Correction
	throughout document	Tramner	Tranmer
2	95	also juvenile sockeye salmon	also found juvenile sockeye salmon
26	91	Mariah	Maria

## APPEARANCES / COMPARUTIONS

Patrick McGowan Wendy Baker, Q.C. Micah Carmody	Associate Commission Counsel Associate Commission Counsel Counsel
Mark East Geneva Grande-McNeill Jonah Spiegelman	Government of Canada ("CAN")
Clifton Prowse, Q.C. Boris Tyzuk, Q.C. Elizabeth Rowbotham	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")
No appearance	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")

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

No appearance	Area D Salmon Gillnet Association; Area B Harvest Committee (Seine) ("GILLFSC")
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")
Anja Brown Crystal Reeves Leah Pence	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")

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

No appearance	Métis Nation British Columbia ("MNBC")
Nicole Schabus	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")
Emily Mak	Metro Vancouver ("METROVAN")

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1  
PANEL NO. 45  
In chief by Mr. McGowan

1 Vancouver, B.C./Vancouver  
2 (C.-B.)  
3 June 15, 2011/le 15 juin 2011  
4

5 THE REGISTRAR: The hearing is now resumed.

6 MR. MCGOWAN: Good morning, Mr. Commissioner. It's  
7 Patrick McGowan. With me is Micah Carmody. We're  
8 counsel for the Commission. We have our second  
9 panel this morning on the wastewater topic. And  
10 looking at the panel, to my left is Mr. James  
11 Arnott, on the right is Dr. Albert van Roodselaar.  
12 They will be the panellists today.

13 Mr. Commissioner, we have one additional  
14 counsel in the room today. To my left and behind  
15 me is Ms. Emily Mak. She is counsel for Metro  
16 Vancouver, and she will be examining the witness  
17 after Commission counsel this morning, her  
18 witness.

19 Could we have the witnesses sworn, please.

20 THE REGISTRAR: Good morning, gentlemen. Could you  
21 each put on your microphones, please.

22  
23 JAMES ARNOTT, affirmed.

24  
25 ALBERT van ROODSELAAR, affirmed.  
26

27 THE REGISTRAR: State your name, please.

28 MR. ARNOTT: James Arnott.

29 THE REGISTRAR: Thank you.

30 DR. van ROODSELAAR: Albert van Roodselaar.

31 THE REGISTRAR: Thank you. Counsel

32 MR. MCGOWAN: Thank you. Mr. Commissioner, I don't  
33 propose to seek to have either of these witnesses  
34 qualified as experts, but I will just ask them a  
35 couple of questions about their background and  
36 mark their c.v.'s by way of introducing them to  
37 you.  
38

39 EXAMINATION IN CHIEF BY MR. MCGOWAN:  
40

41 Q Mr. Arnott, you have been with Environment Canada  
42 since the year 2000?

43 MR. ARNOTT: Yes, that's correct.

44 Q And you're presently the Manager of the Wastewater  
45 Section of Environment Canada?

46 MR. ARNOTT: Yes.

47 MR. MCGOWAN: And just on the screen there we see your

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2  
PANEL NO. 45  
In chief by Mr. McGowan

1           c.v. or your profile. If that could be the next  
2           exhibit.

3 THE REGISTRAR: Exhibit 1056.

4  
5           EXHIBIT 1056: *Curriculum vitae* of James  
6           Arnott

7  
8 MR. MCGOWAN:

9 Q     Dr. van Roodselaar, you're presently the Division  
10     Manager of Utility Planning and Environmental  
11     Management with Metro Vancouver?

12 DR. van ROODSELAAR: That's correct.

13 Q     And you've held that position since the year 2000?

14 DR. van ROODSELAAR: I've held several positions, this  
15     was the last of several positions I held there.

16 Q     With Metro Vancouver.

17 DR. van ROODSELAAR: With Metro Vancouver.

18 MR. MCGOWAN: Thank you. And if we could have Dr. van  
19     Roodselaar's c.v. up, please.

20 MR. LUNN: I was looking for a tab number on that.

21 MR. MCGOWAN: It's 32.

22 MR. LUNN: Thank you.

23 THE REGISTRAR: That will be Exhibit 1057.

24 MR. MCGOWAN:

25 Q     That's the -- Dr. van Roodselaar's c.v.?

26 DR. VAN ROODSELAAR: That's correct.

27 MR. MCGOWAN: Thank you.

28  
29           EXHIBIT 1057: *Curriculum vitae* of Albert van  
30           Roodselaar

31  
32 MR. MCGOWAN:

33 Q     Mr. Arnott, I wonder if you could just briefly  
34     address the Commissioner on where the Wastewater  
35     Section is situated within Environment Canada, or  
36     in the organization, and perhaps briefly explain  
37     what your position is within that section.

38 MR. ARNOTT: Sure, certainly. So within Environment  
39     Canada there's broad branches within the  
40     structure. Wastewater Section is situated,  
41     broadly speaking, within the main regulation  
42     making branch, and that's the Environmental  
43     Stewardship Branch. Within that context, the  
44     Environmental Stewardship Branch is broken up into  
45     a number of different directorates. I'm with the  
46     Public and Resources Sector Directorate. We  
47     develop regulations for wastewater, as well as

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1 we're responsible for other regulations under both  
2 the **Canadian Environmental Protection Act** and the  
3 **Fisheries Act** related to industrial sectors, as  
4 well.

5 Q Thank you. Dr. van Roodselaar, could you please  
6 explain to the Commissioner what Metro Vancouver  
7 is and what its relationship is to its member  
8 municipalities.

9 DR. van ROODSELAAR: Metro Vancouver is the general  
10 name given to the Greater Vancouver Regional  
11 District, and in fact there is three entities.  
12 There is the Greater Vancouver Regional District,  
13 which has its own **Act**, and that is made up of  
14 member municipalities in the Lower Mainland.  
15 There is the Greater Vancouver Sewage and Drainage  
16 District, that's also under its own legislation,  
17 its own **Act**, and that is an entity that provides  
18 wastewater treatment services to its member  
19 municipalities. And then there's the Greater  
20 Vancouver Water District, which is also under its  
21 own **Act**, which provides drinking water services  
22 and treatment to the member municipalities.

23 Q Thank you. The Commissioner heard yesterday about  
24 the new proposed federal regulations relating to  
25 wastewater. Dr. van Roodselaar, I wonder if you  
26 could just briefly explain to the Commissioner  
27 what role you had, or what involvement you had in  
28 the development of the Canada-wide Strategy and  
29 the development of those regulations.

30 DR. van ROODSELAAR: Okay. In terms of the Strategy  
31 now, I believe you're referring to the Canadian  
32 Council of Ministers of the Environment Strategy  
33 for Municipal Wastewater Effluent?

34 Q Yes.

35 DR. van ROODSELAAR: I was involved with that, and in  
36 fact was invited there to be on a Risk Management  
37 Committee of the CCME, that involved other members  
38 on that committee that were provincial  
39 representatives and federal representation, and  
40 basically looking there at appropriate risk  
41 management options and processes with respect to  
42 managing municipal wastewater effluent.

43 Q Thank you.

44 DR. van ROODSELAAR: You asked about the federal  
45 regulation that's currently in draft form, I  
46 believe. I don't really have a role in that in  
47 terms of that's an Environment Canada initiative,

1 as I understand it. And really the only role  
2 there in terms of myself and municipalities  
3 across the country, was opportunity to comment on  
4 those draft regulations that were gazetted, and  
5 basically through CWWA, Canadian Water and  
6 Wastewater Association, and FCM, the Federation of  
7 Canadian Municipalities, bringing some of the  
8 concerns and some of the issues that the members  
9 see as pertinent to the development of the  
10 regulation.

11 Q And Metro Vancouver did make a submission, did  
12 they?

13 DR. van ROODSELAAR: That's correct.

14 Q Mr. Arnott, could you please explain to the  
15 Commissioner what involvement you had in the  
16 development of the Canada-wide Strategy for the  
17 Management of Municipal Wastewater Effluent and  
18 the draft regulations.

19 MR. ARNOTT: Certainly. Within the context of the  
20 period of 2004 to 2009, the period where the  
21 Canada-wide Strategy was developed under the  
22 Canadian Council of Ministers of the Environment,  
23 I was supporting the Canada member on the CCME  
24 Committee, much the same way that Albert spoke to  
25 in terms of the issues, environmental risk  
26 management and some of those concepts that were  
27 integrated into the strategy.

28 Since 2009 when the strategy was endorsed by  
29 the Canadian Council of Ministers of the  
30 Environment, I've been managing the Wastewater  
31 Section in terms of the next step in developing  
32 the proposed regulations under the **Fisheries Act**.  
33 That was a key commitment that the federal  
34 government had within the agreed to Canada-wide  
35 Strategy.

36 Q Could we please have our list of documents 5 on  
37 the screen, please. Now, we've been referring to  
38 the Canada-wide Strategy. The full name is the  
39 Canada-wide Strategy for the Management of  
40 Municipal Wastewater Effluent. That's this  
41 document we see in front of you on the screen?

42 MR. ARNOTT: Yes.

43 Q And that was a strategy developed by Canada and  
44 the provinces, through the CCME, to set an  
45 approach, Canada-wide approach to the regulation  
46 and treatment of wastewater; is that fair?

47 MR. ARNOTT: That's correct, as well as the

1 territories.

2 MR. MCGOWAN: Thank you. If that could be the next  
3 exhibit, please.

4 THE REGISTRAR: Exhibit 1058.

5

6

7

8

9

EXHIBIT 1058: Canada-wide Strategy for the  
Management of Municipal Wastewater Effluent,  
February 27, 2009 [CCME]

10 THE COMMISSIONER: Mr. McGowan, just at this point, if  
11 you could just elicit the structure of  
12 responsibility around legislative control over  
13 this particular issue, so I have a sense of how  
14 these parties relate one to the other.

15 MR. MCGOWAN: Yes, certainly, I'm --

16 THE COMMISSIONER: Perhaps you're coming to that, so I  
17 can wait.

18 MR. MCGOWAN: No, that's fine. Now is perhaps a  
19 convenient time to --

20 THE COMMISSIONER: All right.

21 MR. MCGOWAN: -- do that.

22 Q Are you able to briefly set out for the  
23 Commissioner, explain the structure, explain what  
24 the CCME is, and the division of legislative  
25 responsibility, and I'll ask you perhaps to do  
26 that, Mr. Arnott.

27 MR. ARNOTT: Sure. So CCME in general exists as a body  
28 that jurisdictions, in this case federal,  
29 provincial and territorial governments, can talk  
30 and collaborate and discuss issues related to  
31 environmental protection. Generally environmental  
32 protection is a shared jurisdiction, depending on  
33 the issue. In the case of effluents released from  
34 wastewater systems, that is the case. There's  
35 provincial and federal jurisdiction, and the  
36 territorial jurisdictional issues are a bit  
37 different, but they're at play.

38 So in this case, CCME was the forum that was  
39 chosen to take on this matter. CCME is a  
40 structure, develops agreements that aren't legally  
41 binding. They're agreements that the  
42 jurisdictions agree to do certain things. That's  
43 the case for the CCME Canada-wide Strategy.

44 Q Okay. Now, regulation of wastewater from a  
45 federal perspective is primarily handled at this  
46 point through s. 36(3); is that fair?

47 MR. ARNOTT: Under the authority of the **Fisheries Act**,

1           yes.

2       Q     Yes. And these new proposed regulations under the  
3           **Fisheries Act** would set out in much more detail a  
4           federal approach to regulation of wastewater?

5       MR. ARNOTT: Correct.

6       Q     Each of the provinces also have the capability of  
7           enacting legislation which relates to the  
8           environment in which wastewater is discharged?

9       MR. ARNOTT: Correct.

10      Q     And British Columbia does have legislation dealing  
11           with that?

12      MR. ARNOTT: Legislation, and to be specific, a  
13           regulation.

14      MR. MCGOWAN: Yes. And now, Mr. Commissioner, for your  
15           benefit, these various pieces of legislation are  
16           described in some detail in the Policy and  
17           Practice Report. I'm sure you're familiar with  
18           that, and I'm --

19      THE COMMISSIONER: I am. I was -- I apologize, Mr.  
20           McGowan, I am. I was just trying to get a sense  
21           of where their roles fit into that structure.

22      MR. MCGOWAN: Yes.

23      THE COMMISSIONER: Perhaps that will come out during  
24           the course of your eliciting the evidence. I  
25           just, insofar as these two gentlemen are  
26           concerned, I'm trying to understand where they fit  
27           into this legislative structure, their specific  
28           roles.

29      MR. MCGOWAN: Yes. Thank you.

30      Q     Part of the Canada-wide Strategy is the  
31           development of bilateral agreements?

32      MR. ARNOTT: That's correct.

33      Q     And if you could explain to the Commissioner what  
34           bilateral agreements are in this context.

35      MR. ARNOTT: Okay. Well, maybe I'll first start with  
36           in general the Canada-wide Strategy dealt with two  
37           sets of issues: performance issues that speak to  
38           the nature of effluent quality issues from  
39           wastewater systems, and environmental risk  
40           management concepts within setting those  
41           standards. The other side related to governance,  
42           so that was how the jurisdictions were going to  
43           contemplate continuing to working together. So  
44           within that set of issues under governance, the  
45           Canada-wide Strategy does lay out how that would  
46           work.

47           Given the fact that the federal government is

1 committed to develop regulations under the  
2 **Fisheries Act**, it was recognized that there needed  
3 to be a mechanism or a model that would allow the  
4 continuing collaboration of the jurisdictions.

5 Within the authority of the **Fisheries Act** we  
6 can develop bilateral administrative agreements,  
7 which in general we would intend to have a one-  
8 window kind of regulatory reporting structure  
9 built in. So in this case municipalities or  
10 others that have to report information under the  
11 regulations could do so in a way that they're  
12 reporting just once to both the provincial and  
13 federal regulators.

14 Q Okay, thank you. Now, in terms of the regulations  
15 themselves, and what they'll prescribe and what  
16 the -- and who will carry them out, I wonder if we  
17 can perhaps now walk through the regulations and  
18 deal with some of the key elements under the  
19 regulations. First of all, do the regulations  
20 prescribe a certain level, either a certain level  
21 of treatment or parameters that amount to  
22 prescribing a certain level of treatment that  
23 would be required Canada-wide.

24 MR. ARNOTT: That's a good question, and in fact that I  
25 should speak, in general, the authority we have  
26 under the **Fisheries Act** allow us to prescribe a  
27 quantity or a concentration of a deleterious  
28 substance. So specifically the regs don't  
29 prescribe a specific level of treatment. We  
30 prescribe specific, in this case, concentrations  
31 of four deleterious substances.

32 Q And those four deleterious substances are BOD,  
33 TSS, chlorine and ammonia?

34 MR. ARNOTT: Correct.

35 Q And the levels that are prescribed, practically  
36 speaking, do they amount to a requirement that  
37 plants be upgraded to a minimum of secondary?

38 MR. ARNOTT: That's correct, and I would add that, that  
39 primarily relates to carbonaceous biochemical  
40 oxygen demand, BOD, CBOD in that case, and  
41 suspended solids. For ammonia and chlorine the  
42 levels really relate to, not the issue of level of  
43 treatments, directly, it relates to the issue of  
44 acute toxicity.

45 Q Do the regulations require the testing of or  
46 impose limits with respect to any of the emerging  
47 contaminants of concern?

1 MR. ARNOTT: When you say emerging contaminants of  
2 concern...?

3 Q Things like pharmaceuticals, surfactants, some of  
4 the persisting organic pollutants, PBDEs, matters  
5 such as those.

6 MR. ARNOTT: In general, no. And we could maybe touch  
7 on some of the additional requirements that are  
8 proposed in the regulations under the  
9 environmental effects monitoring, and we could  
10 talk about those features as proposed, because  
11 there are some issues there that relate to your  
12 question.

13 Q Okay. Throughout the process of -- or once the  
14 draft regulations were developed, they were  
15 gazetted and put out for comment through a  
16 consultative process; is that fair?

17 MR. ARNOTT: That's right. So last March published,  
18 the proposed regulations were published in *Canada*  
19 *Gazette Part I*, as we always do, and for a 60-day  
20 open comment period. And then we go into the  
21 phase of reflecting on those comments. In this  
22 case we've done quite a bit of follow-up with  
23 organizations that did provide comments, and  
24 basically spent quite a bit of time on clarifying  
25 some technical issues, as well as further clarify  
26 what some of the comments were.

27 Q And were you involved in reviewing those comments?

28 MR. ARNOTT: Yes, I was.

29 Q And were you involved in considering, or have you  
30 been, in considering possible amendments to the  
31 draft regulations, based on the comments received?

32 MR. ARNOTT: Yes.

33 Q And that process is ongoing, is it?

34 MR. ARNOTT: Yes, it is.

35 Q Okay. And the comments that were received would  
36 be those such as the ones forwarded by Metro  
37 Vancouver?

38 MR. ARNOTT: That's correct.

39 Q And there was a submission, I understand, made by  
40 the Province of British Columbia, as well?

41 MR. ARNOTT: That's correct.

42 Q Did you receive comments with respect to the  
43 degree to which the regulations deal with some of  
44 the emerging contaminants of concern, such as  
45 endocrine-disrupting compounds?

46 MR. ARNOTT: To a certain extent we characterized the  
47 comments we received on the regulations in general



1 in a couple of categories, both in very specific  
2 technical detail in terms of what was proposed as  
3 well as some additional issues, and that was one  
4 of them, certainly.

5 Q Okay. And did some of those comments propose  
6 increased regulatory requirements relating to  
7 matters such as endocrine-disrupting compounds?

8 MR. ARNOTT: I don't recollect that specifically. We  
9 certainly heard about that issue in terms of what  
10 might be emerging as concerns related to some of  
11 those additional substances. But I don't  
12 recollect the direct correlation that you're  
13 making, no.

14 Q Do the regulations require environmental effects  
15 monitoring?

16 MR. ARNOTT: Yes, they do.

17 Q And who do they require it of?

18 MR. ARNOTT: As proposed, there's a mechanism that  
19 would determine that within the regulations, so  
20 the key message there is as proposed, the  
21 environmental effects monitoring provisions would  
22 not apply to all wastewater systems. It would  
23 apply to a certain subset of the sector, and those  
24 that are already complying or already meeting the  
25 effluent quality limits for the deleterious  
26 substances that we spoke of already.

27 Q Okay. Have you determined yet which facilities in  
28 the Fraser watershed, or how many in the Fraser  
29 watershed would be required to carry out the  
30 environmental effects monitoring?

31 MR. ARNOTT: No. The way the regs, the regulations as  
32 proposed would work is both in terms of who would  
33 need to do the environmental effects monitoring  
34 requirements, as well as the compliance timelines  
35 for those that need an upgrade, are all set in  
36 motion once the regulations are finalized, and  
37 it's based on information that needs to be  
38 submitted by municipalities and others that are  
39 required to submit that kind of information.

40 So and just to your point --

41 Q Yes.

42 MR. ARNOTT: -- about the question, we will only know  
43 who is required to do environmental effects  
44 monitoring once we have some of that reporting  
45 happen once the regulations are finalized.

46 Q Will it be the wastewater treatment facility  
47 operators that are required to carry out the

1 monitoring, or is that going to be done by  
2 Environment Canada?

3 MR. ARNOTT: No, the owners/operators of the  
4 facilities.

5 Q Now, there was an issue that was drawn to the  
6 attention of the Commissioner yesterday, which I'd  
7 like you to have an opportunity to comment on, and  
8 that is the proposal under the regs that after a  
9 period of environmental monitoring without the  
10 detection of issues, the environmental monitoring  
11 would not be required to continue. Is that a fair  
12 characterization of what's proposed under the  
13 regulations?

14 MR. ARNOTT: Yes. The -- we have proposed an approach  
15 that, generally speaking, after a couple of cycles  
16 -- so let me step back for a minute. Roughly  
17 speaking, we're contemplating proposed provisions  
18 for environmental effects monitoring that would  
19 last about 13 years. Within that 13-year phase,  
20 we would have four cycles of monitoring, both  
21 water quality monitoring, benthic invertebrate  
22 monitoring and it may also include fish population  
23 monitoring. If there are no effects identified in  
24 the first two cycles within that period, yes, as  
25 proposed, those provisions would not continue.

26 Q And did you receive feedback on the limited  
27 nature, in terms of time of the environmental  
28 monitoring that's required?

29 MR. ARNOTT: Yes, we did. I would characterize the  
30 comments that we received on either side. Some  
31 supported, some thought we needed to go further.

32 Q And given the comments that are received, is  
33 Canada contemplating, are you aware through the  
34 work you've done, making any alterations to that  
35 timing issue?

36 MR. ARNOTT: We are certainly trying to consider  
37 carefully on both sides of the argument. I think  
38 one of the things that we tried to do in the  
39 proposal is reflect on the fact that there have  
40 been lessons learned from the other existing  
41 regulations in the **Fisheries Act** for environmental  
42 effects monitoring provisions. That's partly what  
43 led us to propose the scheme that we did. We will  
44 certainly contemplate how best and in what manner  
45 to finalize those provisions in the final  
46 regulations.

47 Q We had some witnesses here yesterday, you may be

1 aware of them, and they commented on treatment  
2 levels and the degree of technology that's  
3 available. And I think it's a fair  
4 characterization of their evidence that secondary  
5 treatment is a fairly old piece of technology, and  
6 there are much more advanced options available.  
7 Are you aware of technologies that go beyond  
8 secondary in terms of the treatment of wastewater?

9 MR. ARNOTT: Absolutely, yes. In terms of  
10 characterizing levels of treatment, I would  
11 characterize all existing levels of treatment as  
12 technology that's been around for quite some time.  
13 So whether it's secondary wastewater treatment or  
14 even advanced treatment beyond secondary,  
15 typically referred to as tertiary, all those  
16 levels of technology have been existing for quite  
17 some time.

18 Q Given the availability of much more advanced  
19 technology, why did Canada in these proposed  
20 regulations set levels such that they would only  
21 require the upgrade -- plants that would be  
22 upgrading to secondary, as opposed to something  
23 more advanced?

24 MR. ARNOTT: Right. I'll start to provide a bit of  
25 context to the consultation that happened within  
26 the development of the CCME Canada-wide Strategy.  
27 It's one of the issues that played through those  
28 consultations from 2004 to 2009. I think what we  
29 heard through that process was the need for a  
30 national baseline, and that's what ended up  
31 getting reflected in this -- in the CCME Canada-  
32 wide Strategy. One of the commitments that the  
33 federal government was to reflect that baseline  
34 set of national standards within the regulation of  
35 the **Fisheries Act**.

36 Within the CCME Canada-wide Strategy it also  
37 reflects that in certain instances, especially  
38 based on site-specific needs in terms of sensitive  
39 receiving environments, for instance, that there  
40 may need to be more stringent standards in place.  
41 If the CCME Canada-wide Strategy situates the  
42 provincial regulator with that role to basically  
43 set standards for -- that would be more stringent  
44 than the national baseline where required. In  
45 many cases, provinces do that to a certain extent  
46 already.

47 Q Okay. In setting the levels of treatment that are

1 required by prescribing limits, do the regulations  
2 take into account receiving environment or  
3 prescribe different levels for particularly  
4 sensitive receiving environments, or those that  
5 might be considered particularly valuable or  
6 special?

7 MR. ARNOTT: The limits themselves are baseline limits.  
8 In the construct of the regulations, the receiving  
9 environment does get taken into consideration, but  
10 it relates primarily to the approach to compliance  
11 timelines.

12 Q Yes.

13 MR. ARNOTT: So using criteria that looks at existing  
14 effluent quality, what's being discharged now, as  
15 well as specific criteria for the receiving  
16 environment that that effluent's going into right  
17 now, there's three categories of wastewater  
18 systems that are determined for the purposes of  
19 compliance or upgrade to secondary wastewater  
20 treatment, and those three categories relate to  
21 the different timelines that are proposed.

22 Q And just to perhaps summarize what you're saying,  
23 there is a formula set out in the draft  
24 regulations, which would take into account several  
25 factors, one of them being receiving environment,  
26 to develop, to calculate a number of points. And  
27 depending on the number of points calculated, that  
28 would dictate the timeline within which facilities  
29 that wouldn't currently comply with the  
30 regulations would have to upgrade to the level of  
31 compliance. Is that a fair summary?

32 MR. ARNOTT: Yes.

33 Q Okay.

34 MR. ARNOTT: Correct.

35 Q So receiving environment is taken into account in  
36 that calculation.

37 MR. ARNOTT: Yes.

38 Q Did Canada consider doing a similar calculation  
39 and perhaps having a graded level of treatment  
40 that was required that would have required higher  
41 treatment in special receiving environments?

42 MR. ARNOTT: In terms of constructing the proposed  
43 regulations as they are, no. Those issues were at  
44 play in terms of developing the Canada-wide  
45 Strategy, though, and certainly looked at all of  
46 the various options that were at play in terms of  
47 how the federal, provincial and territorial

1 governments would move forward. So I would say  
2 that those options were looked at, at that phase.

3 Once we got to the phase of reaching an  
4 agreement under the Canada-wide -- through the  
5 Canada-wide Strategy, the concept of national  
6 effluent quality standards as a baseline that  
7 would get reflected in a regulation of the  
8 **Fisheries Act** was set in motion, and that's what  
9 we've contemplated in the proposed regulations.

10 Q While we're talking about the point system, Dr.  
11 van Roodselaar, has Metro Vancouver calculated the  
12 points for the two primary facilities in its area,  
13 both Iona and Lions Gate?

14 DR. van ROODSELAAR: Yes, we have.

15 Q And under the proposed regulation what would the  
16 mandated upgrade times be?

17 DR. van ROODSELAAR: According to the calculation we've  
18 done, it would seem that Lions Gate would be a  
19 ten-year timeline, Iona would be a 20-year  
20 timeline.

21 Q Mr. Arnott, is it to be left to the wastewater  
22 treatment operators to calculate their own points,  
23 or is that an exercise that's going to be  
24 undertaken by Environment Canada?

25 MR. ARNOTT: I think that's an exercise that is built  
26 into the regulations as proposed. So the  
27 regulations set out their criteria and the point  
28 scheme, as you just summarized well. So that  
29 information needs to be submitted once the  
30 regulations are finalized. So the municipality or  
31 the owner/operator of the wastewater system has  
32 responsibility to submit that information. The  
33 criteria is quite open and transparent. So that  
34 information gets submitted and that sets in motion  
35 those compliance timelines.

36 Q Okay. Do the regulations presently deal with  
37 biosolids?

38 MR. ARNOTT: No, they do not.

39 Q Okay. Those are a matter of some concern to some  
40 that are --

41 MR. ARNOTT: Yes.

42 Q -- produced as a by-product of the waste treatment  
43 process.

44 MR. ARNOTT: Right. And on that issue, in terms of the  
45 sludges and biosolids that are a by-product of the  
46 wastewater treatment process, we did hear comments  
47 all the way through the development of the Canada-

- 1 wide Strategy for effluents on this, and it is  
2 contemplated that it is an issue that needs to be  
3 dealt with. Currently the Canadian Council of  
4 Ministers of the Environment have been working on  
5 a Canada-wide approach for the management of --
- 6 Q Yes.
- 7 MR. ARNOTT: -- wastewater biosolids. They're about  
8 two-thirds through that process. Actually  
9 consultation on the Canada-wide approach is  
10 ongoing right now.
- 11 Q And is it contemplated that that will -- that  
12 process will ultimately result in some regulatory  
13 framework addressing the issues related to  
14 biosolids?
- 15 MR. ARNOTT: Yes. I think there's similar -- there's  
16 similar issues at play. The Canada-wide approach  
17 is both looking at risk management issues related  
18 to how sludges and biosolids from wastewater  
19 treatment plants are managed. And as well as some  
20 of the existing governance regulatory frameworks  
21 that are in place, and that's primarily  
22 provincially in this case. Federally there's very  
23 limited authority to -- that exists right now in  
24 terms of managing sludges and biosolids.
- 25 Q Okay. Dr. van Roodselaar, what does Metro  
26 Vancouver presently do with its biosolids?
- 27 DR. van ROODSELAAR: In the current, the current  
28 practice that Metro Vancouver has with biosolids,  
29 primarily most of it's going to -- to mine  
30 reclamation. There's two principal locations in  
31 the province where most of our biosolids go for  
32 mine application.
- 33 Q Okay. And is that reclamation of strip mines?
- 34 DR. van ROODSELAAR: That's correct.
- 35 Q Okay. And are any of the sites where the  
36 biosolids are deposited located within the Fraser  
37 River watershed?
- 38 DR. van ROODSELAAR: No. Looked at locations and do  
39 not appear to be relevant to Fraser River.
- 40 Q As a result of the consultative process, Mr.  
41 Arnott, and the feedback you received, are there  
42 any significant changes relating to matters such  
43 as the level or matters to be monitored or the way  
44 in which the Environmental Effects Program will be  
45 administered, contemplated to the proposed regs at  
46 present?
- 47 MR. ARNOTT: Well, as you're probably aware, we're in

1 the middle of that process; there's no final  
2 decisions yet. I would say, though, that at the  
3 core of the regulations and really at the core of  
4 what was agreed to within the CCME Canada-wide  
5 Strategy, there's no significant changes being  
6 contemplated in terms of the effluent quality  
7 standards that reflects the baseline. A lot of  
8 the comments that we received support that. We  
9 also heard comments on either side, as well, but  
10 we're pretty confident that the core of the  
11 regulations will stay intact.

12 We are certainly contemplating a series of  
13 changes that I would characterize as fairly  
14 technical in detail and in some cases adding some  
15 technical clarification, especially as it relates  
16 to subsets of the sector. There are features in  
17 the regulation that would contemplate probably in  
18 a clearer way certain types of wastewater systems  
19 that are -- that currently exist, that would  
20 demand different provisions. And speaking  
21 primarily of smaller wastewater systems, like  
22 lagoon systems that don't discharge continually,  
23 discharge only a couple of times a year, for  
24 instance, that have caused us to think about  
25 additional provisions that better regulate those  
26 kind of systems.

27 Q Okay. What is the target for these regulations  
28 that have been finalized and coming into effect?

29 MR. ARNOTT: The target to finalize and publish final  
30 regulations is the end of this calendar year, the  
31 end of 2011. The regulations as proposed did  
32 contemplate a phased-in approach in terms of  
33 certain parts of the regulation coming in force at  
34 different times. That's certainly still the case  
35 and we're contemplating the most appropriate  
36 phase-in of different features of the regulation.

37 Q And are you still on track to commence the  
38 implementation by the end of this year?

39 MR. ARNOTT: That's what we're targeting, yes.

40 Q Once the regulations come into force, is it  
41 anticipated that they will impact on Environment  
42 Canada's approach to enforcement?

43 MR. ARNOTT: Well, I would say in terms of enforcement,  
44 when we do develop new regulations, it does cause  
45 us to contemplate the best approach in terms of a  
46 compliance strategy that would obviously include  
47 how we would promote compliance for the new

1 requirements, as well as contemplate an  
2 appropriate supporting enforcement approach. So  
3 in terms of where we are right now with the  
4 features of the **Fisheries Act**, including a general  
5 prohibition under 36(3), with the regulation  
6 providing a very specific set of requirements and  
7 very specific set of expectations under the  
8 authority of the **Fisheries Act**, yes, I would think  
9 that would influence the development of that  
10 compliance strategy that included the enforcement  
11 activity.

12 Q Thank you. There are definitions provided for  
13 certain terms that impact on the timing of  
14 upgrades to facilities. For example, "open  
15 marine" is defined --

16 MR. ARNOTT: Correct.

17 Q -- in the regulations.

18 MR. ARNOTT: Yes.

19 Q Was the definition for "open marine" crafted with  
20 any particular wastewater facility in mind?

21 MR. ARNOTT: No, not with any particular facility in  
22 mind. I think that the concepts that were  
23 anchored within the CCME Canada-wide Strategy  
24 again was the starting point for us to contemplate  
25 the criteria within the proposed regulations. We  
26 had to make some changes related to some of that  
27 detail for the risk criteria that primarily  
28 related to the authority we have under the  
29 **Fisheries Act**. We were looking at the issues of  
30 defining certain terms in a national scope, only  
31 in terms of providing some clarity. So that when  
32 regulatees had a chance to look at the proposed  
33 provisions, they would have some better clarity  
34 about what was expected under that risk criteria.

35 Q Dr. van Roodselaar, in making submissions through  
36 this process, did Metro Vancouver make any  
37 submissions suggesting changes to the regulations  
38 that such that the timing of the upgrade to Iona  
39 that's mandated would be affected?

40 DR. van ROODSELAAR: No, I don't believe so.

41 Q Dr. van Roodselaar, Metro Vancouver has had in  
42 place since 2002 a Liquid Waste Management Plan,  
43 correct?

44 DR. van ROODSELAAR: Excuse me, can you...

45 Q Metro Vancouver has had in place since 2002 a  
46 Liquid Waste Management Plan?

47 DR. van ROODSELAAR: That's correct.



- 1 Q And this Liquid Waste Management Plan is not  
2 mandatory, is that fair to say, the use of it?
- 3 DR. van ROODSELAAR: The Liquid Waste Management Plan  
4 is mandatory in that it was approved by the  
5 provincial Minister of the Environment, and under  
6 British Columbia requirements, a jurisdiction has  
7 the option of either operating under the  
8 regulations or developing a management plan  
9 acceptable to the province.
- 10 Q Yes.
- 11 DR. van ROODSELAAR: So at the time that the Minister  
12 accepted that plan, in a letter where the Minister  
13 also provided a number of conditions in the  
14 acceptance of that plan, that plan then became the  
15 requirement for Metro Vancouver.
- 16 Q Yes. My question was awkward. The development of  
17 a plan is one of the options that's available to a  
18 municipality or a wastewater treatment facility in  
19 order to get an operating certificate?
- 20 DR. van ROODSELAAR: That's correct.
- 21 Q Okay. And the other option is just to proceed  
22 under the regulations?
- 23 DR. van ROODSELAAR: That's correct.
- 24 Q Metro Vancouver has elected to proceed by way of a  
25 Liquid Waste Management Plan?
- 26 DR. van ROODSELAAR: That's correct.
- 27 Q Why did Metro Vancouver choose to proceed in that  
28 manner?
- 29 DR. van ROODSELAAR: Well, if you take a large system  
30 like Metro Vancouver, it's quite complex. There's  
31 a lot of different pieces there. And in terms of  
32 developing a rational process to deal with those  
33 various pieces, Metro Vancouver felt that a plan  
34 would best serve that process.
- 35 Q Absent the use of a Liquid Waste Management Plan,  
36 would Metro Vancouver with the facilities it has  
37 be capable of complying with the regulations?
- 38 DR. van ROODSELAAR: Under the plan, it's acceptable.
- 39 Q Yes. Without a plan, would it be acceptable?
- 40 DR. van ROODSELAAR: It would have to be under the  
41 regulations, no.
- 42 Q Okay. Under the Metro Vancouver's Liquid Waste  
43 Management Plan, I understand there's an  
44 Environmental Monitoring Program?
- 45 DR. van ROODSELAAR: That's correct.
- 46 Q And could we please have our list of documents  
47 number 17. The program is described in some

18  
PANEL NO. 45  
In chief by Mr. McGowan

1 detail in a document called GVRD, "Cautions,  
2 Warnings and Triggers: A Process for Protection  
3 of the Receiving Environment"?

4 DR. van ROODSELAAR: That's correct.

5 Q And this is the document we see on the screen?

6 DR. van ROODSELAAR: That's correct.

7 MR. MCGOWAN: If that could be the next exhibit,  
8 please.

9 THE REGISTRAR: Exhibit 1059.

10

11 EXHIBIT 1059: Cautions, Warnings and  
12 Triggers: A Process for Protection of the  
13 Receiving Environment, Volume I - Main  
14 Document, January 2004 [GVRD]

15

16 MR. MCGOWAN:

17 Q And the manner in which environmental monitoring  
18 is conducted is somewhat different for the in-  
19 river facilities as compared to Iona; is that  
20 correct?

21 DR. van ROODSELAAR: Excuse me, can you say that again?

22 Q The manner in which the environmental monitoring  
23 is carried out is somewhat different for Iona as  
24 compared to the in-river facilities?

25 DR. van ROODSELAAR: Well, the environmental monitoring  
26 programs were developed for the specific locations  
27 to which they are applied, so, yes. I mean, in  
28 the case of the Fraser River, we have a flowing  
29 system. In the case of Iona we have a marine  
30 environment.

31 Q Yes, thank you. Could we please have our list of  
32 documents number 14. And with respect to the Iona  
33 environmental monitoring, there was a peer review  
34 of Cycle 3 of that program that was carried out,  
35 correct?

36 DR. van ROODSELAAR: That's correct.

37 Q And this is a copy of the report that was produced  
38 as a result of that peer review?

39 DR. van ROODSELAAR: That's correct.

40 MR. MCGOWAN: I wonder if that could be the next  
41 exhibit, please.

42 THE REGISTRAR: Exhibit 1060.

43

44 EXHIBIT 1060: Peer Review of Cycle 3 of the  
45 Iona Deep-Sea Outfall Environmental  
46 Monitoring Program Final Report, June 2006  
47 [GVRD]

June 15, 2011

1 MR. MCGOWAN: Thank you.

2 Q And if we could just turn to page 54, please. I'm  
3 looking at the document number or the page numbers  
4 at the bottom of the document. One of the  
5 recommendations that's made as a result of this  
6 peer review process, at number 26, was that Metro  
7 Vancouver:

8  
9 Investigate the feasibility of a pelagic,  
10 planktivorous fish species, if an appropriate  
11 one could be identified...

12  
13 Has Metro Vancouver investigated adding pelagic  
14 species to the environmental monitoring process  
15 and, if so, have you proceeded to do so?

16 DR. van ROODSELAAR: Yes. We currently have included  
17 in the testing English sole, Dungeness crab and  
18 shrimp. So we have added shrimp to part of that  
19 study.

20 Q Dungeness crab, are they a pelagic species, to  
21 your understanding?

22 DR. van ROODSELAAR: I'm not familiar with that.  
23 Sorry.

24 Q Okay. Have you added any species or the testing  
25 of any fish that move through the water column and  
26 aren't resident sort of just at one level, close  
27 to the bottom.

28 DR. van ROODSELAAR: No, we, in terms of that  
29 monitoring program, we have a benthic monitoring  
30 program, and we monitor those three species in  
31 terms of Iona.

32 Q Thank you. Could we have our list of documents  
33 number 22, and perhaps just before we move on, if  
34 I could mark that last document, please.

35 THE REGISTRAR: I think you have already marked that  
36 one, that was 1060, the Environmental Management  
37 Final Report.

38 THE COMMISSIONER: That was Tab 14.

39 MR. MCGOWAN: Thank you.

40 THE REGISTRAR: At Tab 14, yes.

41 MR. MCGOWAN: Yes, thank you.

42 Q And if we could then have number 22 from our list  
43 on the screen. And, Dr. van Roodselaar, could you  
44 please explain to the Commissioner what this  
45 document is.

46 DR. van ROODSELAAR: Yeah. This is an annual report  
47 put out by our Quality Control Division, which is

1 part of our Operation and Maintenance Department,  
2 which contains the information in terms of the  
3 ongoing operation of the Greater Vancouver  
4 Sewerage & Drainage District's water treatment  
5 plants.

6 Q And it contains some description of the manner in  
7 which testing is conducted and monitoring is  
8 conducted, and also some information about the  
9 outcomes of that testing, and monitoring.

10 DR. van ROODSELAAR: That's correct, it has a section  
11 on the Environmental Monitoring Program, and  
12 basically summarizes the testing done by Metro  
13 Vancouver with respect to those Environmental  
14 Monitoring Programs.

15 MR. McGOWAN: If that could be the next exhibit,  
16 please.

17 THE REGISTRAR: Exhibit 1061.

18  
19 EXHIBIT 1061: Wastewater - Greater Vancouver  
20 Sewerage & Drainage District Quality Control  
21 Annual Report 2009 [MetroVan]  
22

23 MR. McGOWAN:

24 Q Now, with respect to the waste treatment  
25 facilities in Metro Vancouver and the  
26 environmental monitoring, does your task include  
27 overseeing those facilities and the programs that  
28 conduct the testing and the monitoring?

29 DR. van ROODSELAAR: My role has been involved in the  
30 development of the Environmental Monitoring  
31 Program. As part of the operation of wastewater  
32 treatment plants there is considerable ongoing  
33 monitoring as part of the operational  
34 requirements. So in that part I am not involved.  
35 I have been involved in looking at setting up the  
36 environmental monitoring components.

37 Q Okay. And I take it part of your role includes  
38 the review of information that's received from  
39 these monitoring programs about the potential  
40 impacts of facilities on the receiving  
41 environments?

42 DR. van ROODSELAAR: Yes, the whole idea of the  
43 monitoring programs, of course, is to collect data  
44 and then look at that data within the context of  
45 various parameters that can be used to assess that  
46 data. Water quality objectives would be some  
47 that we would apply to assessing that data. And

1 that's the whole purpose of the Cautions, Warnings  
2 and Triggers approach, is basically a proactive  
3 approach to say where does the facility stand with  
4 respect to these parameters, and is there cause  
5 for concern, is there any significant effect on  
6 the environment and do we have any cause for  
7 concern.

8 Q Okay. With respect to Iona, has the monitoring  
9 that's been conducted disclosed matters that are  
10 cause for concern or any negative effects on the  
11 receiving environment or the surrounding environs?

12 DR. van ROODSELAAR: No. At the present time the  
13 monitoring programs which we've been carrying on,  
14 you know, at the time that the plan was approved  
15 to the present, any effects that we're seeing with  
16 respect to the Iona receiving environment are  
17 negligible, and those small effects that can be  
18 seen are primarily attributed to some nutrient  
19 differences in different parts.

20 Q Prior to approval of your first Liquid Waste  
21 Management Plan in 2002 and surrounding it, it was  
22 put out for some consultation and commented on by  
23 the Department of Fisheries and Oceans and  
24 Environment Canada?

25 DR. van ROODSELAAR: Excuse me?

26 Q The draft Liquid Waste Management Plan --

27 DR. van ROODSELAAR: Yes.

28 Q -- that was approved in 2002, certain aspects of  
29 that were commented on by Environment Canada and  
30 the Department of Fisheries and Oceans?

31 DR. van ROODSELAAR: I believe so, yes.

32 Q Okay. Is it fair to say that there was a fairly  
33 consistent message from the Department of  
34 Fisheries and Oceans and Environment Canada urging  
35 a timely upgrade to Iona?

36 DR. van ROODSELAAR: I think basically what we were  
37 looking at there is we proposed a process, a risk  
38 management process in the development of that  
39 plan, and I think we got communication back from  
40 the federal government that they supported that  
41 plan with respect to that environmental  
42 monitoring, but they were still encouraging Metro  
43 Vancouver to try and upgrade, you know, in the  
44 best possible time that they could.

45 Q Could we have our list of documents number 18, and  
46 there's four subdocuments in there. I'm looking  
47 for the document dated July 30th, 2002 addressed

1 to Chris Badger. Do you know Mr. Badger?

2 DR. van ROODSELAAR: No, I don't.

3 Q This is a document from the Department of  
4 Fisheries and Oceans addressed to a Mr. Badger,  
5 who was at that time with the Vancouver Port  
6 Authority. And the very last paragraph on the  
7 first page reads:

8  
9 In the past three years, DFO and EC Pacific  
10 Region have sent more than five letters to  
11 the GVRD, and have met with them to request  
12 firm and reasonably short schedules for  
13 compliance with the **Fisheries Act** at Iona and  
14 Lions Gate, and the --

15  
16 - and just carrying over the page -

17  
18 -- and the timely elimination of combined  
19 sewer overflows (CSOs),...

20  
21 So have you become familiar with, I'll ask again,  
22 a consistent message that was coming with respect  
23 to the upgrade to Iona from Environment Canada or  
24 the Department urging timely upgrades to the Iona  
25 facility?

26 DR. van ROODSELAAR: I mean, as you see here, I mean,  
27 obviously it was in the interest of Canada to see  
28 those upgrades move along at as timely a pace as  
29 possible. They also raised the issue of the  
30 combined sewer overflows, which were another part  
31 of it. Metro Vancouver and its member  
32 municipalities have been working on those  
33 different pieces. With respect to combined sewer  
34 overflows, this is something that has been  
35 proceeding according to planning at a regular  
36 pace.

37 Combined sewers are located in Vancouver,  
38 part of Burnaby, and New Westminster, and those  
39 have required and are being carried out on a  
40 regular basis to separate those sewers. Because  
41 what's required there is in fact taking the one  
42 sewer, which is currently carrying storm water and  
43 sanitary wastewater, separating those into two  
44 pipes, and conveying those separately, the  
45 sanitary wastewater going to the wastewater  
46 treatment plant.

47 This is an extremely complex process where

1           you have to go into every street in, let's say,  
2           Vancouver, separate those. As you move through  
3           and do a portion, you then have to subdivide that  
4           portion so you can convey that separately to the  
5           wastewater treatment plant, with respect to the  
6           wastewater, and carry the storm water out.

7           So that's one piece of comment there in terms  
8           of what's referenced here that you're showing me.  
9           And then also with respect to Iona and Lions Gate,  
10          you know, the whole issue there in terms of being  
11          able to meet things like LC50 fish bioassays.

12         Q       Right. Just, well, you've touched on the combined  
13          sewer issue, and there's perhaps just one thing we  
14          should clarify on that. The combined -- the  
15          sewers that are being separated in Vancouver, are  
16          those owned by Metro Vancouver or by the City of  
17          Vancouver?

18         DR. van ROODSELAAR: They are owned by the City of  
19          Vancouver.

20         Q       And who is doing the upgrade to them?

21         DR. van ROODSELAAR: That would be the City of  
22          Vancouver.

23         Q       Okay, thank you. The Liquid Waste Management Plan  
24          that was approved in 2002 set a deadline for the  
25          upgrade of Iona at 2020; is that correct?

26         DR. van ROODSELAAR: Yes. In fact, it addressed both  
27          Lions Gate and Iona as shown here. Iona at that  
28          time was 2020, Lions Gate was 2030.

29         Q       The new Liquid Waste Management Plan mandates that  
30          you upgrade Iona by as soon as possible, but no  
31          later than 2030; is that a fair characterization?

32         DR. van ROODSELAAR: That's correct. And that was with  
33          basically reference to the CCME Strategy, and  
34          accepting the Strategy as approved by Environment  
35          Canada and the province.

36         Q       Okay.

37         DR. van ROODSELAAR: And looking to that strategy for  
38          guidance, yes.

39         Q       What do you see the approval as mandating that you  
40          do with respect to Iona in terms of timing?

41         DR. van ROODSELAAR: Can you elaborate?

42         Q       You said that it's consistent with the Canada-wide  
43          Strategy. Under the Canada-wide Strategy you  
44          would be mandated to upgrade by 2030; is that  
45          correct?

46         DR. van ROODSELAAR: That's correct.

47         Q       And do you see the approval letter as being

1 consistent with that?

2 DR. van ROODSELAAR: Yes, I do. You're talking about  
3 the provincial Minister's approval letter for the  
4 new -- the new Liquid Waste Management Plan?

5 Q Yes. If we could have it, it's now an exhibit,  
6 but it was our document 29.

7 THE REGISTRAR: Do you wish to mark that last document?

8 MR. MCGOWAN: Yes, if we could mark that last document,  
9 please.

10 THE REGISTRAR: Yes. Within Tab 218 of the four  
11 documents there, CAN number 459564 will be marked  
12 as Exhibit number 1062.

13  
14 EXHIBIT 1062: Letter from S. Farlinger,  
15 Department of Fisheries and Oceans, to C.  
16 Badger, Vancouver Port Authority, re GVRD  
17 Liquid Waste Management Plan, July 30, 2002  
18

19 MR. MCGOWAN: Thank you. And the document I'm looking  
20 for now is 1050, that's the exhibit number 1050.

21 MR. LUNN: Thank you.

22 MR. MCGOWAN:

23 Q Reading from the paragraph that has the number 1  
24 before it.

25 DR. van ROODSELAAR: Yes.

26 Q And just sort of skipping to the second half of  
27 that sentence, or maybe I'll just read the whole  
28 sentence:

29  
30 The Minister supports upgrading to secondary  
31 level treatment the Lions Gate wastewater  
32 treatment plant by 2020 and Iona Island  
33 wastewater treatment plant as soon as  
34 possible, but no later than 2030.  
35

36 My question to you, in your position reading that  
37 letter, do you interpret that as consistent or  
38 inconsistent or somehow different from what's  
39 mandated under the Canada-wide Strategy?

40 DR. van ROODSELAAR: I think that's consistent with the  
41 Canada-wide Strategy.

42 Q Okay.

43 DR. van ROODSELAAR: It's also consistent with the text  
44 in the new Liquid Waste Management Plan, where the  
45 board has indicated that they will, they intend to  
46 upgrade Iona by 2030, but as soon as possible in a  
47 10- to 20-year timeframe.



1 Q Do you attach any significance to the word in the  
2 approval, the words in the approval "as soon as  
3 possible"?

4 DR. van ROODSELAAR: I think that's a statement of  
5 encouragement, and I do. I think, however, that  
6 what Metro Vancouver has to do, there's obviously  
7 different complexities and pieces that are going  
8 to be involved in complying with that. I think  
9 the intent of the board is stated very clearly,  
10 that they, too, wish to see that being done as  
11 soon as possible in terms of, you know, no later  
12 than 2030, but ideally sooner than 2030, and  
13 towards 2020. However, having said that, I mean,  
14 obviously what Metro Vancouver also has to deal  
15 with is the various pieces involved in planning  
16 and in development and design and funding, and  
17 dealing with the various land issues, First Nation  
18 issues, and other issues with respect to making it  
19 all happen.

20 Q Thank you. If we could have our list of documents  
21 number 8, please. And going to the bottom of the  
22 second paragraph, the last sentence -- this is a  
23 letter to you from Environment Canada; is that  
24 correct?

25 DR. van ROODSELAAR: Can you just scroll up, please.

26 Yes, that's correct. Yes.

27 Q And this is sent to you in April of 2009 --

28 DR. van ROODSELAAR: Yes.

29 Q -- providing comments on the draft at that point,  
30 draft Liquid Waste Management Plan, the one that  
31 was just approved?

32 DR. van ROODSELAAR: Yes.

33 Q Okay. And in that context Environment Canada is  
34 saying to Metro Vancouver in the last sentence:

35  
36 However, in the interest of protecting the  
37 environment, we strongly encourage Metro  
38 Vancouver to upgrade its wastewater treatment  
39 plants without delay.  
40

41 DR. van ROODSELAAR: Mm-hmm.

42 Q And those upgrades that are being referred to  
43 there would be Iona and Lions Gate?

44 DR. van ROODSELAAR: That's correct.

45 MR. CARMODY: If that could be the next exhibit,  
46 please.

47 THE REGISTRAR: Exhibit 1063.

1 EXHIBIT 1063: Letter from M. Wilson,  
2 Environment Canada, to A. van Roodselaar,  
3 Metro Vancouver, re Environment Canada's  
4 comments on Metro Vancouver's Liquid Waste  
5 Management Plan Five-Year Review, April 24,  
6 2009  
7

8 MR. MCGOWAN:

9 Q Has the consistent message that's coming from  
10 Environment Canada and the Department of Fisheries  
11 and Oceans, encouraging the timely upgrade of  
12 these facilities, as they put it, in the interest  
13 of protecting the environment, caused you to  
14 question your concern that any effects from the  
15 outfall of Iona are negligible?

16 DR. van ROODSELAAR: You're saying whether their  
17 encouragement puts question to the Environmental  
18 Monitoring Program that we have in place, and the  
19 conclusions that come from those Environmental  
20 Monitoring Programs?

21 Q Your review, you told the Commissioner, of those  
22 Environmental Monitoring Programs has caused you  
23 to conclude that any effects from Iona are  
24 negligible.

25 DR. van ROODSELAAR: That's correct. Those programs  
26 we've had in place are very comprehensive. I  
27 would suggest that our Environmental Monitoring  
28 Programs are the most comprehensive of any done by  
29 a practitioner, a wastewater treatment plant  
30 system operator in the country, possibly on the  
31 continent. The other aspect of Metro Vancouver's  
32 process is that we review those monitoring  
33 programs with our Environmental Monitoring  
34 Committee on a monthly basis, on a regular basis.  
35 We meet with them and we provide all documentation  
36 in terms of the results of those monitoring  
37 programs.

38 At the table of that Environmental Monitoring  
39 Committee we have the province, and until quite  
40 recently we had the federal government. We have  
41 representatives from University of British  
42 Columbia, as well as Simon Fraser University. We  
43 have a public member. We have a representative  
44 from Health. So these various individuals that  
45 have responsibility for those regulated areas are  
46 at the table, are fully open to the results of  
47 those monitoring programs. We hire expert

1 consultants to carry out those various monitoring  
2 programs on our behalf. They present those  
3 results to the Environmental Monitoring Committee.  
4 Those results are discussed, and I think if there  
5 were particular concerns with those results, that  
6 opportunity to bring that forward and for Metro  
7 Vancouver to become aware of that, from other than  
8 simply Metro Vancouver's assertion, is there.

9 So, yes, I think it's reasonable and very  
10 responsible on Metro Vancouver's point of view in  
11 terms of how we carry out those monitoring  
12 programs, and the manner in which they are vetted  
13 in terms of determining whether the conclusions  
14 are reasonable.

15 Q We had some scientists here yesterday, including  
16 Dr. Ken Ashley and Dr. Peter Ross, both of whom  
17 expressed some level of concern about potential  
18 negative impacts on the receiving environment of  
19 Iona. Have you had concerns, any concerns of that  
20 nature expressed to you or expressed to Metro  
21 Vancouver?

22 DR. van ROODSELAAR: Well, I mean, in terms of the way  
23 you put it, you say "potential" for concerns with  
24 respect to the environment, and I think I wouldn't  
25 -- certainly wouldn't quibble with that. I think  
26 there are constituents in municipal wastewater,  
27 depending on their concentration, the nature of  
28 the receiving environment, the manner in which  
29 they would interact with that receiving  
30 environment, that potentially could be of concern.  
31 And I think that is the whole point of our  
32 monitoring program and of our Cautions, Warnings  
33 and Triggers Process, and of our review with other  
34 authorities, is to ensure to the best of our  
35 capability that that is not the case. That to the  
36 ability we can affirm it, that we are not causing  
37 a significant environmental concern.

38 Q Thank you. You mentioned the Environmental  
39 Monitoring Committee, and I just have a couple of  
40 questions to you about that. Could we have our  
41 list of documents number 4, please. Sorry, that's  
42 not the document I'm looking for. If I could just  
43 have a moment.

44 It's our document 16, please. These are the  
45 Terms of Reference for the Environmental  
46 Monitoring Committee, which was originally created  
47 under your first Liquid Waste Management Plan; is

1           that correct?

2 DR. van ROODSELAAR: That's correct.

3 Q     And if you could just very, in a sentence or two,  
4       explain to the Commissioner what the Environmental  
5       Monitoring Committee does.

6 DR. van ROODSELAAR: The Environmental Monitoring  
7       Committee in brief basically works with Metro  
8       Vancouver in terms of reviewing the Environmental  
9       Monitoring Program, in terms of its scope, its  
10      design, looking at the results, and being able to  
11      advise Metro Vancouver as to changes that should  
12      be occurring to those monitoring programs, and  
13      also being able to advise Metro Vancouver as to  
14      concerns that may arise out of those monitoring  
15      programs. So that would be sort of an  
16      encapsulated version, I think, of that committee.

17           And, you know, to look at the membership of  
18      that committee, the intention was to have  
19      individuals on that committee that would represent  
20      both the authority and the expertise to be able to  
21      make those kind of judgments.

22 Q     Thank you. If we could turn to page 3 of the  
23      document, the top half. There is a list of the  
24      proposed groups that would be represented on the  
25      Environmental Monitoring Committee, correct?

26 DR. van ROODSELAAR: That's correct.

27 Q     And if we look at the third and fourth from the  
28      bottom, we see Department of Fisheries and Oceans  
29      and Environment Canada listed.

30 DR. van ROODSELAAR: That's right.

31 Q     Does the board presently have a representative  
32      from either the Department of Fisheries and Oceans  
33      or from Environment Canada?

34 DR. van ROODSELAAR: No. We had both representatives  
35      when we started with the Liquid Waste Management  
36      Plan in 2002. Somewhat later the Department of  
37      Fisheries and Oceans informed us that Environment  
38      Canada would be able to represent the federal  
39      responsibilities with respect to representation on  
40      this committee. And so at that time we ceased to  
41      have the DFO representative, and we continued to  
42      have the Environment Canada representative. We  
43      had the Environment Canada representative until  
44      2009, and at that time, you know, in 2010 we did  
45      not have an Environment Canada representative.  
46      And the chair of the Environmental Monitoring  
47      Committee wrote to the federal government

1            requesting that they appoint a replacement or a  
2            new representative from Environment on the  
3            Monitoring Committee, and the chair and the  
4            committee were advised that Environment Canada was  
5            not going to do that. The reasons given were  
6            twofold: One was restructuring at Environment  
7            Canada, was the first reason, and then the second  
8            one that was given to the chair was that  
9            Environment Canada felt that a representative on  
10           this committee might be in contradiction with  
11           their regulatory responsibilities. And I'm using  
12           my own words there now.

13        Q        Yes. No, I accept that. Does Metro Vancouver  
14           continue to desire the presence of the Department  
15           of Fisheries and Oceans and Environment Canada on  
16           its Monitoring Committee?

17        DR. van ROODSELAAR: Absolutely. I think, you know,  
18           the kind of questions you've asked me earlier in  
19           terms of veracity of the program, and in terms of  
20           the correctness of the conclusions coming out of  
21           the Environmental Monitoring Program, and the  
22           environmental assessments, I think individuals  
23           from those two Departments would go far to adding  
24           credibility to that.

25        MR. MCGOWAN: Okay. If that could be marked as the  
26           next exhibit, please, the Terms of Reference.

27        THE REGISTRAR: Exhibit 1064.

28  
29                    EXHIBIT 1064: GVRD Environmental Monitoring  
30                    Committee Terms of Reference, March 5, 2001  
31

32        MR. MCGOWAN:

33        Q        In terms of the upgrade to Iona, does Metro  
34           Vancouver have in place a plan presently that  
35           dictates the anticipated or targeted timing for  
36           the upgrade aside from the 30-year outer limit set  
37           by the federal regs and the approval letter?

38        DR. van ROODSELAAR: No, I can only refer to the  
39           approved plan, which was board approved, and  
40           basically the board has indicated in that plan  
41           that they will meet the 2030 timeframe, and that  
42           they would like to do it sooner than that, within  
43           the ten years prior to that. I certainly can't  
44           speak or fetter the discretion of the board with  
45           respect to, you know, that kind of statement. I  
46           mean, that's their statement.

47        Q        Okay. Mr. Arnott, have you been able to ascertain

1           whether the federal government has been approached  
2           by Metro Vancouver for funding assistance with  
3           respect to the upgrade to Iona?

4       MR. ARNOTT: Yes. And before I provide that answer,  
5           Environment Canada is the regulator within this  
6           context. We're not the funder. That's --

7       Q       Yes.

8       MR. ARNOTT: -- another agency, that's Infrastructure  
9           Canada. Infrastructure Canada has advised that  
10          Metro Vancouver has submitted an application for  
11          the upgrade to Iona. That application is being  
12          considered by Infrastructure Canada. They'd be in  
13          that process for some time. I would imagine  
14          they'd be in communication fairly extensively with  
15          the provincial government, as well. And so within  
16          that context there's no decision being made.

17          The only other thing I would add, within the  
18          context of developing both the CCME Canada-wide  
19          Strategy and developing the federal regulations of  
20          the **Fisheries Act**, we certainly are in  
21          communication with Infrastructure Canada officials  
22          in terms of the policy and the technical details  
23          that we're working towards. So they're certainly  
24          aware.

25          And in the broader context of the  
26          Infrastructure funding, budget 2011 did confirm to  
27          legislate the permanent transfer of the gas tax  
28          funds, \$2 billion per year, to municipal  
29          governments. That would include obviously the  
30          ability to use that money for upgrading wastewater  
31          facilities. And budget 2011 also did confirm an  
32          approach that the federal government would take  
33          along with province and territories,  
34          municipalities for the Federation of Canadian  
35          Municipalities primarily, to develop a long-term  
36          approach to infrastructure funding, especially  
37          beyond the current funding programs that exist  
38          right now, for instance, the Building Canada Fund.

39       Q       Okay. Dr. van Roodselaar, did the application for  
40          funding that went to the federal government  
41          specify the level of upgrade that was being  
42          contemplated, whether to secondary or something  
43          beyond secondary?

44       DR. van ROODSELAAR: I can't speak to the specific  
45          document. I know that the intention is looking at  
46          the equivalent of the regulation and meeting the  
47          requirements of the regulation.

1 Q Okay. With the availability of much more advanced  
2 technologies for the treatment of wastewater, some  
3 of which we heard about yesterday, why is Metro  
4 Vancouver not contemplating upgrading to a level  
5 beyond secondary at Iona?

6 DR. van ROODSELAAR: Well, I think what you're asking  
7 there is --

8 Q Maybe I should first ask you if they are  
9 contemplating an upgrade to something beyond  
10 secondary.

11 DR. van ROODSELAAR: Yeah, I mean, really we're  
12 undergoing a process right now where we're looking  
13 at, you know, the various aspects of what's going  
14 to go into the upgrade of the wastewater treatment  
15 plants. There's obviously, as I mentioned  
16 earlier, a number of different factors. Part of  
17 the constraint will be, you know, the footprint of  
18 the area available and other things.

19 Certainly the aspects of environmental  
20 concerns will be part of that assessment and will  
21 be brought into that determination in terms of,  
22 you know, what the upgrade should look like. Now,  
23 when I say that, I think I also need to elaborate  
24 in the sense that, you know, you're talking about  
25 Metro Vancouver.

26 Q Yes.

27 DR. van ROODSELAAR: And talking about the GVS&DD, and  
28 we're basically an operator of wastewater  
29 treatment plant facilities. We're not  
30 researchers. We're not in the business of looking  
31 at the development of water quality guidelines and  
32 water quality objectives, and those things. We  
33 look to senior government, the province and the  
34 federal government with respect to those  
35 parameters. We can only use those parameters and  
36 those values when developed by senior levels of  
37 government to then try and determine, you know,  
38 what we think might be appropriate.

39 And I think, you know, some of the things  
40 that have been brought up earlier in discussion  
41 here that I've heard is concern with respect to  
42 things like pharmaceuticals, and so on, and  
43 chemicals of emerging concern. And I think part  
44 of the difficulty of Metro Vancouver when we're  
45 going through that process, and we are going  
46 through that process, is to say, how are we going  
47 to consider, how are we supposed to consider some

1 of those things, when in fact senior levels of  
2 government don't have enough information  
3 themselves to set guidelines or objectives, more  
4 forcefully, in terms of those parameters. Because  
5 there is a paucity of information out there with  
6 respect to what the environmental consequences of  
7 some of those things might be, and in what kind of  
8 concentrations.

9 The other thing that I think I need to also  
10 include here is that we need to also consider that  
11 wastewater treatment plants are not absolutes. I  
12 mean, they cannot deal with everything. And  
13 consequently again if you're looking at the design  
14 and the upgrade of a wastewater treatment plant, I  
15 think you have to put it in context, and you have  
16 to say, well, you know, there are some of the  
17 chemicals that are recalcitrant that are not  
18 necessarily going to be effectively dealt with by  
19 a wastewater treatment plant, regardless of some  
20 of the types of technologies that might be  
21 available. And so that, you know, they have to be  
22 dealt with by other means. And some of the things  
23 that we're seeing out there, well, there's the  
24 historic one of PCBs, and currently there's quite  
25 a bit of concern with respect to flame retardants,  
26 or PBDEs with respect to their effect on the  
27 environment. But again, these are chemicals that  
28 themselves are not well dealt with in the context  
29 of a wastewater treatment plant.

30 Q Maybe let me ask the question this way. There's  
31 been a mandate to upgrade Iona since at least  
32 2002. It's now got to the stage of submitting an  
33 application for funding. Is Metro Vancouver  
34 proposing to upgrade to secondary or something  
35 beyond secondary?

36 DR. van ROODSELAAR: Well, I think Metro is certainly  
37 going to meet the regulatory requirements, and I  
38 think that is, you know, a technology that is  
39 normally termed secondary would be applied to do  
40 that. What the options are in terms of that  
41 technology, I think that's still under  
42 development.

43 Q Are you able to assist us in understanding why  
44 Metro Vancouver has rejected the idea of going  
45 with a more advanced waste treatment facility for  
46 the Iona receiving environment?

47 DR. van ROODSELAAR: Well, I guess the difficulty I



1           have with that question is, is I'm not sure, you  
2           know, when you say "advanced", what does that  
3           mean? There's various types of treatment, even  
4           within the context of what's typically called  
5           secondary, there are many different types of  
6           treatment that are available out there. And so,  
7           you know, when you say "other" or "advanced",  
8           that's a difficult question.

9           Q     You're aware there are a number of technologies  
10           that go beyond what is traditionally termed  
11           secondary, sometimes called tertiary treatment  
12           facilities.

13          DR. van ROODSELAAR: In the case of -- if you look  
14           within Canada, in the case of tertiary treatment,  
15           a lot of the facilities in the country that have  
16           gone tertiary treatment, have gone to a type of  
17           treatment that deals more with nutrient removal.  
18           So oftentimes if you have a wastewater treatment  
19           plant in an inland province, discharging into a  
20           small water body, the question of nutrients and  
21           the effect of nutrients on the environment can be  
22           very large. So in that case those facilities,  
23           yes, have had to go to a tertiary type or nutrient  
24           removal type of treatment.

25          THE COMMISSIONER: Mr. McGowan, we'll take...

26          MR. MCGOWAN: Mr. Commissioner this would be a  
27           convenient time.

28          THE COMMISSIONER: Thank you.

29          THE REGISTRAR: The hearing will now recess for 15  
30           minutes.

31

32                           (PROCEEDINGS ADJOURNED FOR MORNING RECESS)

33                           (PROCEEDINGS RECONVENED)

34

35          THE REGISTRAR: The hearing is now resumed.

36          MR. MCGOWAN: Thank you, Mr. Commissioner. Those are  
37           my questions for the panel. Ms. Mak will be going  
38           next.

39          THE COMMISSIONER: Thank you, Mr. McGowan.

40          MS. MAK: The last name is Mak, M-a-k, first initial  
41           E., counsel for Metro Vancouver. I'm sure you've  
42           heard this all before, but I will try to keep my  
43           questions very brief, and I just have a few  
44           clarification points, and for Dr. van Roodselaar  
45           to expand on a couple of points made during this  
46           examination in chief.

47          THE COMMISSIONER: Thank you, Ms. Mak.

1 CROSS-EXAMINATION BY MS. MAK:  
2

3 Q Dr. van Roodselaar, at the beginning of your  
4 evidence you briefly discussed Metro Vancouver and  
5 the nature of the acronyms, Greater Vancouver  
6 Regional District, GVRD, and the GVS&DD. Just for  
7 the benefit of the Commission, could you just  
8 provide a little bit more explanation about what  
9 you meant by the term "member municipalities" and  
10 the phrases, "drainage district" or "sewerage  
11 areas".

12 DR. van ROODSELAAR: Yes. If you look at the Metro  
13 Vancouver area, the Metro Vancouver member  
14 municipalities make up those parties that are  
15 served by the services provided by Metro Vancouver  
16 in terms of wastewater treatment in the case of  
17 the GVS&DD. The areas, the sewerage areas are  
18 relative to the particular wastewater treatment  
19 plant that's served by that sewerage area. So in  
20 the case of Iona, the Vancouver sewerage area  
21 would be Vancouver and a piece of Burnaby, and I  
22 believe a piece of Richmond is included in that  
23 sewerage area, but largely the City of Vancouver.  
24 If you're looking at Annacis, the sewerage area  
25 includes a large number of different  
26 municipalities in that sewerage area. Lions Gate  
27 is on the North Shore, so it's the North Shore  
28 municipalities served by that sewerage area, and  
29 then Lulu is served Richmond.

30 Q You had also made reference to the "board". Can  
31 you just expand on who comprises the board, and  
32 how the voting structure and financing scheme  
33 work?

34 DR. van ROODSELAAR: Yes. The board is made up of  
35 members from the -- individuals from the member  
36 municipalities. Now, depending on the weighting,  
37 different municipalities have different voting  
38 levels on the board, but basically then in total,  
39 that board then just determines what it wants to  
40 do. Now, in the case of the GVS&DD, that's not  
41 the Metro Vancouver or GVRD board, that's the  
42 GVS&DD board that makes determinations with  
43 respect to the wastewater treatment systems. I  
44 guess it's important to note, I mean, these board  
45 members are coming from the councils and include  
46 mayors from those member municipalities that have  
47 to provide the finances that are required to fund

1 these various infrastructure works for the various  
2 sewerage areas.

3 Now, in the case of Iona, the way the  
4 structure is set up, a very large proportion of  
5 the costs there would go to those individuals  
6 living in the Vancouver sewerage area in terms of  
7 that upgrade. So again, in terms of the concerns  
8 of members of that area, I mean, they'd be looking  
9 at very significant financial implication in terms  
10 of their occupants and, you know, the effect that  
11 this would have in terms of the people living in  
12 that area and their resistance to a very large  
13 rate hit. So that's all part of that, that whole  
14 sewerage area question.

15 Q While we're on the topic of the City of Vancouver,  
16 it's probably the municipality where there's the  
17 most interest with respect to combined sewer  
18 overflows and CSO separation. You mentioned it  
19 briefly this morning. But just for the benefit,  
20 very briefly, could you just describe what the  
21 process would be for CSO separation within the  
22 City of Vancouver?

23 DR. van ROODSELAAR: Yeah, the combined sewers are  
24 present in those municipalities that are the  
25 oldest municipalities in the Lower Mainland, and  
26 so consequently, Vancouver, the City of Vancouver  
27 is one of those, with part of Burnaby, and New  
28 Westminster is the other area that's very old and  
29 consequently has combined sewers. Because back in  
30 the '50s, this was the normal way that sewerage --  
31 sewers were built, basically they were designed to  
32 carry both sanitary sewerage and storm water. And  
33 consequently to then separate those systems to get  
34 the sanitary sewerage going to the wastewater  
35 treatment plant and the storm water being  
36 diverted, requires that the whole system from  
37 every street in the combined sewerage area has to  
38 be separated.

39 And I mean, one approach would be you have to  
40 separate the whole system before you would have a  
41 truly separated system. But, I mean, that's a  
42 huge job and highly disruptive. So the way it's  
43 typically done is you're doing a certain section,  
44 you then have to design so you can take the  
45 sanitary sewerage from that section, you can't put  
46 it back into the rest of your system, which may  
47 still be combined sewerage, you now have to -- you

1           lay it in some fashion to the wastewater treatment  
2           plant, and also you have to provide a proper  
3           location for storm water discharge.

4           So this is a very complex, highly disruptive  
5           process that Metro Vancouver is working on. In  
6           the original plan, they basically had a timeline  
7           going to 5050 for -- excuse me, 2050 for --

8           Q     That's a long plan.

9           DR. van ROODSELAAR: That would be a long plan. 2050  
10          for complete separation of that system, because  
11          it's not a simple piece. And it's not just the  
12          cost, although the cost in total would rival the  
13          cost of a wastewater treatment plant of around a  
14          billion dollars, but it's also the disruptive  
15          nature of the whole process.

16         Q     So just following on your earlier description of  
17          the relationship between member municipalities and  
18          the Greater Vancouver Sewerage & Drainage  
19          District, is it fair to say that the upgrades to  
20          Iona would be borne by the City of Vancouver  
21          primarily, as a member of the Vancouver Sewerage &  
22          Drainage District, as well as the costs of CSO  
23          separation through the City of Vancouver's own  
24          responsibility to separate.

25         DR. van ROODSELAAR: To a large extent that's correct.

26         Q     I also want to take you to the policy and planning  
27          report that's been prepared for the Commission. I  
28          take it you've read that report, Dr. van  
29          Roodselaar?

30         DR. van ROODSELAAR: I went through it, yes, indeed.

31         Q     Mr. Lunn, could I ask you to bring that PPR up to  
32          page 34, and you could zoom in on paragraph 85,  
33          please. The intention of the policy and planning  
34          report is to speak in broad strokes to provide  
35          some background information for the Commission,  
36          and there's a general statement here at paragraph  
37          85 that:

38  
39                   Municipal governments across Canada have the  
40                   mandate to provide sewage treatment, as well  
41                   as to control discharges into the sewer  
42                   systems.

43  
44                   And I just want to get into a little bit more  
45                   detail about the latter part of that sentence,  
46                   which is the ability to control discharges into  
47                   the sewer systems.

1 My hope is that with the benefit of your  
2 explanation, Doctor, the Commissioner's  
3 recommendations can be appropriate to the various  
4 levels of government that are involved with  
5 sewage, the control of discharge to sewer. So  
6 could you from an operational perspective describe  
7 what happens when the toilet flushes, and with a  
8 private lateral all the way to the treatment  
9 system.

10 DR. van ROODSELAAR: Right. Yeah, what 85 refers to is  
11 municipal governments across Canada, and the  
12 GVS&DD, GVRD, are not municipal governments,  
13 they're regional. And GVS&DD provides a regional  
14 service of wastewater treatment to member  
15 municipalities. So in fact those members are  
16 municipal governments.

17 This creates an additional level of  
18 complexity to the system, in that the sewerage  
19 from the member municipalities are then collected  
20 in trunk sewers that belong to the GVS&DD and are  
21 conveyed to the wastewater treatment plants that  
22 are owned and operated by the GVS&DD. Where this  
23 adds the additional complexity is that GVS&DD does  
24 not have control of the municipal sewers. The  
25 individual municipalities in fact control those  
26 municipal sewers.

27 The other thing is that the individual  
28 municipalities also have the responsibility with  
29 respect to the private properties that connect  
30 into those municipal sewers. So therefore, you  
31 know, if somebody was going to take action with  
32 respect to, as you called them, private laterals,  
33 or the sewers that go from, for instance in terms  
34 of a home, from the home to the street where it  
35 hooks up into the municipal sewer, that would be  
36 the municipality that would have to take that and  
37 that would have that authority, not the GVS&DD.  
38 The GVS&DD's responsibility only comes into effect  
39 at the point where the municipal sewer is  
40 discharged into the sewers of Metro Vancouver.

41 So the other difficulty there is of course is  
42 that the GVS&DD doesn't therefore manage the  
43 discharge into those municipal sewers. They don't  
44 directly deal with the content of those sewers,  
45 including both in terms of volumes and  
46 constituency. We get sort of what's delivered to  
47 us from our member municipalities, and then we

1 have to deal with that through our wastewater  
2 treatment plants.

3 Q At yesterday's Commission hearings the  
4 Commissioner heard about the notion of source  
5 control, and that it's been suggested as a way to  
6 reduce the introduction of contaminants into the  
7 waste stream. You've now provided an explanation  
8 of how the wastewater flows, literally, to the  
9 GVS&DD wastewater treatment plants. How does this  
10 type of system affect the ability to use source  
11 control from a regulation and enforcement  
12 perspective. And by that I mean Metro Vancouver's  
13 ability to use regulation and enforcement to  
14 control the source.

15 DR. van ROODSELAAR: Well, okay, there's two aspects  
16 now. Metro Vancouver has a Regulation and  
17 Enforcement Division that deals with regulation of  
18 ICI sector, institutional, commercial, and it then  
19 regulates those. But even there is limited in the  
20 sense that in the City of Vancouver, the City of  
21 Vancouver has its own enforcement officers. So  
22 again, there's a shared jurisdiction there.

23 So the problem, however, with that kind of  
24 regulation is that by the time that something  
25 comes into Metro Vancouver sewer and we realize  
26 that there might be a concern trying to trace that  
27 back to where it came from, and secondly, if you  
28 can, getting the burden of proof in terms of  
29 taking action and even, you know, getting a  
30 conviction, and assuming the success of getting a  
31 conviction after you've gone through all these  
32 other hoops of trying to track it, you know, is  
33 the penalty sufficient to deter. So, you know,  
34 that's a difficulty in that end.

35 Then on the individual household end, even  
36 more difficult in the sense that we don't control  
37 those discharges in any direct way. And what we  
38 try to do with respect to the public, to the  
39 individual householders, is apply sort of the  
40 tools of moral suasion, where we put in programs  
41 that try and educate the public in terms of the  
42 consequence of their discharge. But that's a very  
43 indirect way of trying to affect behaviour to  
44 solve the problem.

45 So, you know, in case of, let's say,  
46 pharmaceuticals, one area that we were looking at  
47 there is working with the Pharmaceutical

1 Association, the druggists, and so on, in terms of  
2 return programs of those pharmaceuticals. Don't  
3 flush them down your toilet if you have leftover  
4 pills. We don't want to see them there. We don't  
5 want them in the system. So we have that kind of  
6 a program, like I say, of moral suasion.

7 But then you also have to realize in the case  
8 of those kind of things, that when people are  
9 taking their medication, and certainly very  
10 difficult to say you can't have your medication,  
11 when that medication is taken a certain proportion  
12 of that medication will pass through and be  
13 excreted from that individual into the sewer  
14 system. And only a portion of that medication  
15 will actually make it into the body to do what it  
16 was designed to do. So again, even in that case,  
17 we still have the consequences in our sewers, we  
18 have these kind of materials that are going to be  
19 carried. And to the degree that we can deal with  
20 them, we try to deal with them. But, you know,  
21 those are not necessarily easily to deal with  
22 types of substances that we have there.

23 Q Before we took a break, Dr. van Roodselaar, you  
24 were providing the Commissioner with some  
25 information about Metro Vancouver Environmental  
26 Monitoring Program, and the Cautions, Warnings and  
27 Triggers document. I just want to back it up for  
28 a moment. If you could describe how the  
29 Environmental Monitoring Program came about, and  
30 what are the components and what's involved in  
31 carrying out that type of extensive monitoring  
32 program?

33 DR. van ROODSELAAR: Well, okay, the program itself  
34 came out of a requirement, although we were doing  
35 some monitoring before that, came out of a  
36 requirement in the 2002 Liquid Waste Management  
37 Plan. And there was also a requirement in that  
38 2002 plan to then submit to the province by 2004,  
39 the beginning of 2004, a process by which this  
40 monitoring information would be used to determine  
41 what effect was being had on the environment by  
42 the various parameters that were being monitored.

43 So to do that, we worked with the  
44 Environmental Monitoring Committee and we worked  
45 through various stages of the initial monitoring  
46 program. And certainly the first one that was of  
47 prime focus was to design the best possible

1 monitoring program for Iona. And we went through  
2 the Environmental Monitoring Committee and worked  
3 with the Environmental Monitoring Committee to see  
4 what that would look like, and to develop that,  
5 and that then resulted in the Cautions, Warnings  
6 and Triggers document that was provided to the  
7 provincial government, submitted to the provincial  
8 government in 2004, and that was accepted.

9 So the components of the monitoring program  
10 are looking at the water column, they're looking  
11 at the benthos, they're looking at the sediments,  
12 and we also have fish surveys, as well.

13 Q And just in terms of a sense of scale or order of  
14 magnitude, how much does it cost, and I'm just  
15 asking for ballpark, but to understand how  
16 extensive this program is, how much does it cost,  
17 the people power involved with running this kind  
18 of program. Could you just comment on that?

19 DR. van ROODSELAAR: Well, it's in the millions. I  
20 mean, if you look at the cost of the hiring of the  
21 consultants to undertake the studies, the Metro  
22 Vancouver staff that manage the programs, and the  
23 laboratory costs for the various analyses that  
24 have to be undertaken, this is a program that runs  
25 in the order of probably three, four million.

26 Q And how do you distinguish the environmental  
27 monitoring or do you distinguish the Environmental  
28 Monitoring Program from scientific research?

29 DR. van ROODSELAAR: Oh, definitely. If you look at  
30 the conditions of the approval letter from the  
31 Minister in 2002, for the Liquid Waste Management  
32 Plan at that time, there was number of different  
33 conditions, and there was one condition in  
34 particular, I believe it was condition 7, where  
35 there was a whole range of aspects that the  
36 condition asked Metro Vancouver to develop a  
37 program for. And that was a challenge, because  
38 the thing is that those were really in the purview  
39 of researchers, and Metro Vancouver is a service  
40 provider. We're not a research facility. We  
41 don't provide those kinds of -- we don't have  
42 those kind of skills in terms of research. We  
43 look to universities and government research  
44 agencies to provide that. So that was a bit of a  
45 challenge.

46 And so what we thought about was, well, how  
47 can we satisfy that condition. How can we look at



1 things like genomics, EDCs, you know, various  
2 types of things like that which are sort of  
3 cutting edge, you know, even now, highly under  
4 development, how can we satisfy that. So we went  
5 back to the Environmental Monitoring Committee and  
6 what we said is that we propose that the way to  
7 satisfy that is that we collaborate with, we work  
8 with the universities, we work with the government  
9 research agencies to undertake those studies that  
10 are relevant, because these are pieces of research  
11 work. So we have, you know, provided some funding  
12 and we work with, we cooperate with the various  
13 research facilities and agencies in the area.

14 I guess one example would be work we're doing  
15 with SFU where Dr. Francis Law, Toxicologist, at  
16 SFU, is working on a yeast assay, looking at  
17 estrogen-type compounds that might be significant,  
18 and developing testing protocols on that. Now,  
19 the latest piece of that work is where we're  
20 cooperating also with Environment Canada. There's  
21 currently an Environment Canada study going on,  
22 directed or managed by, I believe it's Dr. Shirley  
23 Anne Smyth, where she's looking at different  
24 wastewater treatment plants across the country in  
25 terms of different types of plants and how they  
26 might be responding to the input of different  
27 types of organics, these various organics that  
28 have been mentioned, like the pharmaceuticals, the  
29 personal care products, and to see how those might  
30 be responding. So again we're cooperating there.  
31 In that case we sort of acted as the middleman  
32 where Dr. Law is now doing samples from across the  
33 country.

34 MS. MAK: Those are my questions.

35 THE COMMISSIONER: Thank you, Ms. Mak.

36 MR. EAST: Mr. Commissioner, Mark East for Department  
37 of Justice, Government of Canada. I'm here with  
38 my co-counsel, Geneva Grande-McNeill. I just have  
39 a few questions, and I have been allotted 25  
40 minutes and I'll keep it to that timeline.

41  
42 CROSS-EXAMINATION BY MR. EAST:

43  
44 Q I just have a few questions, actually, for Mr.  
45 Arnott, and it's mostly going to relate to a  
46 couple of documents, and primarily one document,  
47 and that's the RIAS, or the regulatory -- sorry,

1 the Regulations and the Regulatory Impact Analysis  
2 Statement, that's Exhibit 1047, Tab 6 of the  
3 Commission's list of documents. Mr. Arnott, we're  
4 going to jump into the topic, and I just want to  
5 step back a bit, the topic of the regulations, and  
6 maybe ask you some questions about the policy  
7 challenges and policy purposes of the regulations.  
8 And I think the Regulatory Impact Statement  
9 perhaps it provides a good foundation for that.

10 I'd like to go first to page 12 in Ringtail  
11 in the document. And near the bottom it says  
12 under "Status quo", and the heading above that is  
13 "Regulatory and non-regulatory options  
14 considered", and there's a discussion of the  
15 status quo. And then it starts off by noting  
16 subsection 36(3) of the **Fisheries Act**, then in the  
17 last five lines from the bottom, I'd just like to  
18 read this line:

19  
20 This current prohibition --

21  
22 - s. 36(3) -

23  
24 -- is not always aligned with the regulatory  
25 regimes of the provinces and territories. It  
26 has resulted in various levels of wastewater  
27 treatment across Canada which means that  
28 Canadians do not necessarily enjoy similar  
29 levels of benefits.  
30

31 I'd like to stop there.

32 From your perspective in Ottawa and the  
33 Government of Canada, national, you know, looking  
34 at this, is the national perspective on these  
35 issues of wastewater regulation something that you  
36 are particularly looking at in these regulations?

37 MR. ARNOTT: Yes, and in terms of the broad context, I  
38 think a couple of those sentences in the status  
39 quo part of the Regulatory Impact Analysis  
40 Statement does provide a backbone for what led to  
41 the conversation, again with the provinces and the  
42 territories, about how all jurisdictions should  
43 come together and try to figure out a way through  
44 the issues of different levels of requirement that  
45 existed across the country, and try to construct a  
46 harmonized framework that we could all act under  
47 in a consistent way.

1           So that's what led to the development of the  
2           Canada-wide Strategy through CCME. In our view it  
3           does provide that framework, that harmonized  
4           framework to act both in terms of establishing  
5           national effluent quality standards, as well as a  
6           framework to continue to work together in terms of  
7           the implementation of the federal reg, along with  
8           the existing provincial frameworks that are in  
9           place.

10          Q     Okay, thank you. And then actually the next page,  
11                 right at the bottom, page 13. The last two  
12                 sentences on page 13. Again we obviously in this  
13                 process, we've been focused on Pacific Coast, and  
14                 the Vancouver area, especially with respect to  
15                 municipal wastewater. The last two sentences,  
16                 though:

17  
18                 Without a nationally consistent regulatory  
19                 approach, it would be much more difficult to  
20                 ensure that all Canadians enjoyed a similar  
21                 level of protection for their water  
22                 resources. As such, the proposed Regulations  
23                 have been developed to achieve the desired  
24                 objective.

25  
26                 And focusing on "desired objective", is the  
27                 message here that the purpose of these regulations  
28                 is to provide national baseline standards for  
29                 municipal wastewater treatment?

30          MR. ARNOTT: Correct. And I'd also take you to the  
31                 first sentence under "Regulatory measures" where  
32                 the regulations were considered as the best option  
33                 for achieving the objective of reducing those  
34                 risks to ecosystem health, fish resources, and  
35                 human health posed by wastewater effluent.

36          Q     And this, in terms of your consultation and  
37                 stakeholder feedback, I take it there wasn't any  
38                 serious disagreement from the stakeholders that  
39                 these harmonized regulations were not a good idea?

40          MR. ARNOTT: I think there was broad support for  
41                 especially the jurisdictions working together to  
42                 come up with both national baseline standards that  
43                 could be achieved over time, as well as a broader  
44                 approach to continued cooperation and  
45                 collaboration by the senior levels of government.

46          Q     Thank you. And perhaps if we can go to page 9 of  
47                 this document, and second-to-last paragraph,

1 starting with the word "Despite", and I think this  
2 perhaps echoes some of what Dr. van Roodselaar was  
3 saying about the local situation, but here I'm  
4 interested in this paragraph:  
5

6 Despite the increase in public infrastructure  
7 investment over the past decades, Canada's  
8 wastewater systems are aging. A large  
9 percentage of these were constructed in the  
10 1960s and, as of 2007, it was estimated that  
11 many facilities had passed over 60% of their  
12 useful life nationally. Thus, significant  
13 new investment will be required for this  
14 sector in the near future.  
15

16 Is this one of the major considerations that were  
17 facing you in developing these regulations?

18 MR. ARNOTT: I would say it was certainly a significant  
19 factor in developing the regulations in the  
20 context of implementation. I think one of the  
21 broad issues we heard through consultation was the  
22 need to construct regulations that reflected  
23 national standards that took into account the fact  
24 that new investments were going to be required for  
25 older and aging facilities, and that we should  
26 take that into account in terms of implementation.

27 Q And if you go over to the next page, page 10,  
28 there's an interesting map of Canada. And it  
29 talks about, I guess, where you get the darker  
30 colour, and looking over at the charts, it's,  
31 "Proportion of the Served Population with less  
32 than Secondary Treatment". And you look over at  
33 British Columbia, we're kind of in the middle  
34 between the "10-50%" range. What this seems to  
35 suggest that there is a wide variation nationally  
36 in the levels of treatment.

37 MR. ARNOTT: Yes, that's correct.

38 Q And if you go up to the paragraph right above the  
39 map, as you -- even the last sentence of the  
40 previous paragraph, it talks about at this point:

41  
42 ...3.2% of the population served by sewer  
43 systems [still] had no treatment for their  
44 wastewater effluent.  
45

46 And then continuing:  
47

1                   Additionally, the degree of wastewater  
2                   treatment varies greatly across Canada. For  
3                   instance, there are much lower treatment  
4                   levels for releases to coastal waters than  
5                   inland fresh waters.  
6

7                   And then there's a reference to the map. I'm  
8                   interested, too, and it says with respect to  
9                   British Columbia:

10                   Additionally, British Columbia has  
11                   approximately 36% of its served population  
12                   receiving less than secondary treatment.  
13  
14

15                   So again I guess this would just reinforce the  
16                   theme that one of the primary purposes of these  
17                   regulations is to ensure the harmonization  
18                   nationally.

19                   MR. ARNOTT: Yes. The harmonization nationally and, as  
20                   well, the CCME Canada-wide Strategy does provide  
21                   that harmonized framework for both, in this case  
22                   British Columbia to act provincially, and for the  
23                   federal government to act through the regulations  
24                   that we're developing.

25                   Q     Thank you. I'd like to move on to another topic  
26                   in the same document, however, and that's at page  
27                   7 in Ringtail.

28                   MR. LUNN: Sorry, page...?

29                   MR. EAST: Page 7 in Ringtail at the bottom, start at  
30                   the bottom.

31                   Q     And there's been a lot of questions about  
32                   environmental effects monitoring, and I just want  
33                   to make sure that we're not mixing two different  
34                   concepts here. The regulations deal with -- well,  
35                   first of all, let's look at the heading here,  
36                   "Effluent monitoring". And perhaps I can read  
37                   this, and then ask you to comment:  
38

39                   Effluent monitoring and reporting  
40                   requirements are also specified under the  
41                   proposed Regulations. Owners or operators  
42                   of --  
43

44                   - and go over to the next page -  
45

46                   -- wastewater systems would be required to  
47                   install, maintain and calibrate monitoring

1 equipment and to monitor the volume and the  
2 composition of the effluent.  
3

4 And it talks a little bit more about this  
5 requirement in the regulations. This is not the  
6 same as the environmental effects monitoring that  
7 we've been discussing; is that right?

8 MR. ARNOTT: That's correct. In this case these  
9 provisions as contemplated would apply to all  
10 wastewater systems under the regulations.

11 Q And these aren't the -- these aren't the  
12 regulations that would expire after a two-year  
13 period of time. These are ongoing?

14 MR. ARNOTT: These are ongoing and they would be  
15 consistent and would be maintained.

16 Q Thank you. The next paragraph does talk about the  
17 receiving environment monitoring, as they call it  
18 here, also defined as environmental effects  
19 monitoring. A couple of things about this, and  
20 we've had some discussions about this and there's  
21 two questions I just want to follow up on.

22 I think earlier on in your testimony Mr.  
23 McGowan asked you about emerging contaminants of  
24 concerns, and I think you indicated that, well,  
25 we'll get back to this, but, you know, there's  
26 elements of looking at these contaminants in the  
27 context of environmental effects monitoring. And  
28 forgive me if I missed it, but I don't believe you  
29 got back to that. Did you want to add to that as  
30 far as whether or not this monitoring will take  
31 into account, you know, contaminants other than  
32 the ones prescribed in the regulations?

33 MR. ARNOTT: Right. So within the provisions that are  
34 proposed, it does include other parameters to  
35 monitor. So under the theme that's characterized  
36 in this paragraph, water quality monitoring, there  
37 are other substances that would be required to be  
38 monitored within these provisions, as well as some  
39 of the other activities that were required for  
40 environmental effects monitoring, like monitoring  
41 benthic and in some cases fish populations.

42 So the broader issues that might be  
43 contemplated under that water quality monitoring  
44 are issues of some emergent substances, especially  
45 as it relates to endocrine function, as well as  
46 looking at issues related to nutrient inputs to a  
47 particular receiving environment. And that's why

1           you'll see in the specific provisions requirements  
2           for parameters that relate to nutrient loadings.  
3        Q     And we heard some testimony from Dr. van  
4           Roodselaar about the purposes for which Metro  
5           Vancouver does environmental effects monitoring.  
6           What is, in the context of these regulations,  
7           what's the purpose of the environmental effects  
8           monitoring?

9        MR. ARNOTT: Yes. And it's a bit different in our  
10       context of why we would propose receiving  
11       environment or environmental effects monitoring  
12       provisions. In this case it really is to evaluate  
13       the effect of the effluent quality standards that  
14       are within the regulations, and looking  
15       specifically at protecting fish and fish habitat.  
16       So it's designed a performance measure for the  
17       regulations.

18           And I should also be clear that these  
19       additional receiving environment monitoring  
20       requirements would only be for those wastewater  
21       systems that are already meeting the secondary  
22       wastewater treatment effluent quality standards.  
23       It would not apply to those that still need to  
24       upgrade, because as I spoke to, really these  
25       additional requirements are looking at the  
26       effectiveness of the regulations within the  
27       context of achieving those effluent quality  
28       standards, those baseline effluent quality  
29       standards.

30       Q     Thank you. Staying on the same topic, you alluded  
31       earlier or referred to earlier to some of the  
32       lessons learned from some of the other regulations  
33       under the **Fisheries Act** that have environmental  
34       effects monitoring. Are those references to the  
35       **Pulp Mill Effluent Regulations** and the **Metal**  
36       **Mining Effluent Regulations**?

37       MR. ARNOTT: That's correct.

38       Q     And what are some of the lessons learned, I  
39       suppose, from those processes that made its way  
40       into these regulations?

41       MR. ARNOTT: Well, I think the lessons learned get  
42       reflected directly into what we proposed, in the  
43       sense that I would characterize it as two main  
44       features, whereas proposed in the environmental  
45       effects monitoring requirements are targeted at a  
46       subset of the entire sector, in this case the  
47       wastewater sector is much different than the

1 industrial sectors that are regulated under those  
2 regulations that you mentioned. So we did have to  
3 contemplate a specific subset, and we proposed a  
4 risk-based approach to identify what we felt the  
5 right system should do these additional  
6 environmental effects monitoring requirements,  
7 that's number one.

8 I think number two is the lessons learned  
9 about making sure that we've got the appropriate  
10 kinds of requirements for environmental effects  
11 monitoring, and that there is a start and a finish  
12 to these requirements. Because at the end of the  
13 day, they are designed to be a performance check.  
14 We think as proposed the information that would be  
15 collected through the phase that's proposed, would  
16 inform future amendments to the regulation, future  
17 amendments to both environmental effects  
18 monitoring provisions, as well as the effluent  
19 quality standards, and we don't -- then we  
20 wouldn't need to have the endless cycle of  
21 feedback for that purpose. We'd be contemplating  
22 those amendments based on what's proposed.

23 Q Thank you. I want to move now to some of the  
24 regulations performance measurements requirements  
25 and the easiest way to do this perhaps is to go to  
26 page 31 in Ringtail. And perhaps I'd like to go  
27 to the last paragraph on page 31. Sorry, I'm  
28 going to back up. Maybe go up to under the  
29 heading, "Performance measurement and evaluation".  
30 And in this paragraph, if I'm reading this  
31 correctly, there is paragraphs relating to the  
32 immediate, intermediate and final outcomes of  
33 these regulations. Could you talk a little bit as  
34 to project, you know, particularly what these  
35 stages of outcomes are.

36 MR. ARNOTT: Certainly. Within the broad context of  
37 these regulations, in developing a Regulatory  
38 Impact Analysis Statement, the basis for the text  
39 that we're talking about currently, the  
40 contemplation of a lot of these features that are  
41 described here relate to requirements that we face  
42 under Treasury Board Secretariat within the  
43 federal government. When any federal government  
44 department contemplates regulations, regulations  
45 go through a process designed by Treasury Board.  
46 And in this case this regulation has a high  
47 regulatory impact and we do have to contemplate in



1 quite a bit of detail features like a performance  
2 measurement and evaluation plan.

3 So as described here, there's different  
4 phases of how we would measure specific outcomes  
5 of the regulation, and that includes features like  
6 as described in the second paragraph there, where  
7 we're determining a percentage of the regulated  
8 community that's reporting on time, and in terms  
9 of whether that regulated community is in  
10 compliance with the effluent quality standards.  
11 So we've had to contemplate a measurement and  
12 evaluation plan that includes all the various  
13 steps in terms of establishing a new regulation,  
14 and how it would get implemented over time.

15 Q And then leading into my next question, which is  
16 the last paragraph, and the first sentence is:

17  
18 The proposed Regulations would require  
19 regulatees to submit reports through an  
20 electronic reporting system developed by  
21 Environment Canada.  
22

23 Has that been developed or is that being developed  
24 now?

25 MR. ARNOTT: Yes, it is being developed. We see it as  
26 a key feature of moving forward in terms of  
27 implementing the federal regulations, as well as a  
28 key feature of establishing bilateral agreements  
29 with provinces in terms of that regulatory  
30 reporting for municipalities and others that have  
31 to report under the regulations.

32 I should also add that the federal government  
33 developing an electronic reporting system was a  
34 commitment that we made under the CCME Canada-wide  
35 Strategy as well.

36 Q Okay. And internally more to government, I  
37 suppose, further down in the paragraph, starting  
38 on the line that says "Annual reports".  
39

40 Annual reports based on the routine reporting  
41 required by the proposed Regulations would  
42 also be produced and made publicly available.  
43 In addition, the effectiveness of the  
44 national effluent quality standards in  
45 protecting fish and fish habitat would be  
46 evaluated through environmental effects  
47 monitoring studies and reported on by

1 Environment Canada.

2  
3 I think the first sentence is relatively  
4 straightforward. Can you talk a little bit about  
5 what's anticipated in the second sentence?

6 MR. ARNOTT: Well, I think we've spoken to that a few  
7 minutes ago. In terms of how we would situate  
8 future amendments to the regulations, we'd  
9 certainly be looking at the environmental effects  
10 monitoring information studies, the data that's  
11 reported there. I think it's just in terms of  
12 reporting back out, Environment Canada typically  
13 reports back out publicly summaries of those  
14 requirements, in this case, the environmental  
15 effects monitoring provisions.

16 Q Thank you. And just being my last line of  
17 questions on this document, I just want to talk a  
18 little bit about the cost-benefit discussion, and  
19 maybe start with page 2 of the document. Now, my  
20 understanding is that with these Regulatory Impact  
21 Statements there's quite, I think, a mandated  
22 cost-benefit analysis that goes into any kind of  
23 regulatory regime.

24 MR. ARNOTT: That's correct. Yes.

25 Q And under the heading "Cost-benefit statement",  
26 can you zero in on that, on the second line:

27  
28 While the estimated costs of the proposal are  
29 significant (in the order of \$5.9 billion in  
30 discounted 2010 dollars), the overall  
31 quantified benefits are almost three times  
32 this amount, totalling \$17.6 billion. This  
33 results in a benefit to cost ratio of almost  
34 3:1 for the country as a whole.

35  
36 I take it this is considered a good ratio?

37 MR. ARNOTT: It is a good ratio. Within the context of  
38 what Treasury Board expects Departments to do in  
39 terms of a benefit-cost calculation, they are  
40 looking for a broad national check on those  
41 issues, not designed necessarily to contemplate  
42 case-by-case or wastewater system-specific issues.  
43 That's recognized that they can be different. We  
44 did in this case here, comments on the cost-  
45 benefit approach, but it really related to  
46 wastewater system or municipality-specific issues  
47 that could play into how the cost-benefit would

1 play out to case-by-case.

2 But generally speaking, Treasury Board is  
3 looking for a broad national scope. That's what's  
4 contemplated here. And any ratio that gets close  
5 to one-to-one is the only time that there would be  
6 pause to think about the regulatory approach.

7 Q And maybe just to probe into that a little bit  
8 further, I'd like to go to page 15, again in  
9 Ringtail. And there's a "Table 1 - National  
10 ranking of wastewater facilities in Canada". And  
11 just noting the heading says, "Number of  
12 Facilities Requiring Upgrades Based on National  
13 Ranking System", and I think maybe we've had this  
14 in evidence already. But it says here British  
15 Columbia 5, medium risk, upgraded by 2030; 8, high  
16 risk, upgraded by 2020. Is that your  
17 understanding?

18 MR. ARNOTT: Yes, that's correct. And I should add the  
19 table as presented was based on the existing  
20 information that was available by any means that  
21 we had. And as we've spoken to already today,  
22 these numbers would not get finalized until the  
23 regulations are actually finalized.

24 Q Okay. And so going further down, there's another  
25 "Table 2", again, that's a restatement of what we  
26 already said, "Benefits to cost ratio", "Total  
27 benefits", over 17 billion, "Total cost" almost  
28 six billion, the "Benefit/Cost" ratio of 3:1. Are  
29 you familiar with -- well, first of all, maybe let  
30 me ask this question. On page 16, next paragraph  
31 -- next page, sorry, "Wastewater system costs".  
32 And this is where it talks about, the second  
33 paragraph:

34  
35 The total costs to wastewater system owners  
36 and operators are estimated to be \$5.9  
37 billion discounted to 2010 dollars.

38  
39 And breaks it down a bit more. That's based on a  
40 standard of secondary treatment, is that right?

41 MR. ARNOTT: That's correct, yes.

42 Q So these numbers would not necessarily be the same  
43 if there were upgrades or expected upgrades to  
44 more, we sometimes call, advanced treatment  
45 facilities.

46 MR. ARNOTT: Advanced or tertiary, yes, that's correct.

47 Q Okay.

1 MR. ARNOTT: I should -- sorry.

2 Q Yes.

3 MR. ARNOTT: I should also add that we did hear  
4 comments in terms of the way the numbers are  
5 characterized in the Regulatory Impact Analysis  
6 Statement, in terms of it being labelled as  
7 discounted to 2010 dollars. If these were not  
8 discounted numbers, they'd be higher which  
9 reflects some of the other estimated values in the  
10 range of 10 billion to 13 billion in undiscounted  
11 terms, just to be -- just to make that distinction  
12 between two ways of representing these kind of  
13 numbers.

14 Q Okay. My final question on this, this one goes to  
15 page 19 of Ringtail. And under "Table 3 - Present  
16 value net benefits of proposed Regulations" broken  
17 down by jurisdiction, there's a line that talks  
18 about "Costs", "Capital Costs", "O&M", "Non-  
19 Capital" and "Cost to Government". And then the  
20 "Benefits", and interesting here looking under the  
21 "BC" line. Are you familiar with how they  
22 identified the benefits? Like, I'm curious as  
23 what "WTP" means -- willingness to pay.

24 MR. ARNOTT: Willingness to pay. Yeah, I mean, in  
25 terms of the economists that are responsible for  
26 these kind of calculations, there's a number of  
27 ways that they would approach this calculation.  
28 Within the context of this sector, there was a,  
29 how would I say, a factor that was used in the  
30 calculation of willingness to pay calculation, or  
31 a factor in the calculation where given this is a  
32 public, publicly owned, publicly operated sector,  
33 some of the issues have come up already during  
34 testimony today. That was factored in to how the  
35 benefit cost was calculated.

36 Q Okay. Anyway, at the far right column the number  
37 there for "NET Benefit" to B.C., as reflected in  
38 the willingness to pay principle and the property  
39 value increase, is over \$5 billion in British  
40 Columbia.

41 MR. ARNOTT: Yes, correct.

42 Q The final question, and just my last one, and this  
43 is related to Tab 5, Exhibit 1058. And the  
44 Canada-wide Strategy for the Management of  
45 Municipal Wastewater Effluent, are you familiar  
46 with this document?

47 MR. ARNOTT: Yes.

1 Q Page 13 of Ringtail. There's a reference to a  
2 "Science and Research" heading, and it says:  
3

4 To promote coordinated research and  
5 disseminate information within the municipal  
6 wastewater effluent sector, a committee is  
7 needed. Such a committee would track who is  
8 researching what, what has already been done  
9 and what the key research priorities should  
10 be in the future.  
11

12 And going down to the bottom:  
13

14 The proposed committee would publicize  
15 projects and results to prevent duplication  
16 and to promote collaboration among  
17 researchers. It would neither conduct nor  
18 fund research.  
19

20 Has this been set up?

21 MR. ARNOTT: Yes, it has. Within the context of CCME  
22 there's two federal-provincial-territorial  
23 committees that are set up related to wastewater,  
24 one dealing with the implementation of the Canada-  
25 wide Strategy for Municipal Wastewater Effluent,  
26 as well as the committee that's set up to look at  
27 that Canada-wide approach being developed for  
28 wastewater biosolids. So under those two  
29 committees, there is now a third committee set up  
30 to meet this commitment to better coordinate  
31 science and research amongst the jurisdictions.  
32 Environment Canada is leading that process in  
33 terms of making some next steps, and contemplating  
34 the right model to establish in terms of figuring  
35 out research priorities and how to move forward.

36 So, yes, the committee has been set up. They  
37 are moving forward in very early stages to deliver  
38 some results.

39 MR. EAST: Thank you, Mr. Arnott. Those are my  
40 questions, Mr. Commissioner.

41 THE COMMISSIONER: Thank you very much, Mr. East.

42 MR. MCGOWAN: Mr. Commissioner, I'm going to suggest we  
43 break for the lunch break now. We'll continue  
44 with this panel for one hour till the afternoon  
45 break, following which the gravel topic will  
46 commence.

47 THE COMMISSIONER: Thank you very much.

1 THE REGISTRAR: The hearing will now adjourn until 2:00  
2 p.m.  
3

4 (PROCEEDINGS ADJOURNED FOR NOON RECESS)  
5 (PROCEEDINGS RECONVENED)  
6

7 THE REGISTRAR: The hearing will now resume.

8 MR. MCGOWAN: Yes, Mr. Commissioner, as I advised this  
9 morning, this panel will conclude at three o'clock  
10 followed by a brief break, and then the gravel  
11 topic will commence.

12 Just before Mr. Leadem commences his cross-  
13 examination, I wanted to deal with one exhibit-  
14 related matter. You'll recall that yesterday Dr.  
15 Ken Ashley testified and we filed his c.v., but at  
16 the time I advised we were going to apply some  
17 redactions to it. We've now done so, so we've  
18 replaced Exhibit 1045 with the redacted version.

19 THE COMMISSIONER: Thank you. Mr. Leadem?

20 MR. LEADEM: Mr. Commissioner, Leadem, initial T.,  
21 appearing as counsel for the Conservation  
22 Coalition. I'm going to ask leave -- I'm having  
23 trouble with my hearing today, Mr. Commissioner.  
24 It may have something to do with the ambient  
25 noise, but I'm going to ask leave to have the  
26 headphones on so I can hear the answers.

27 THE COMMISSIONER: Oh, absolutely, no problem.  
28

29 CROSS-EXAMINATION BY MR. LEADEM:  
30

31 Q Gentlemen, I act for the environmental community,  
32 a group of environmental organizations that you  
33 are probably familiar with such as the David  
34 Suzuki Foundation and a number of other related  
35 organizations. So my questions are going to be  
36 primarily coming from that aspect and that  
37 perspective. I want to begin by examining some  
38 documents with you.

39 MR. LEADEM: I'm going to ask Mr. Lunn to pull up  
40 Conservation Coalition number 13 which is not the  
41 one that I want. I think it's a letter, "Warning  
42 Respecting an Alleged Violation". That's it,  
43 thank you. I'm not sure if I'm off on numbering.  
44 If so, I'm going to be off for the rest of the  
45 balance of my cross. I apologize.

46 MR. LUNN: That's all right. Thank you.

47 Q This appears to be a letter dated March 20, 2001

1 written, as you will see, if you can scroll down  
2 to the signature column, from Inspector Nick Russo  
3 who's with the -- Spill Assessment Biologist,  
4 Environment Canada. Is this a document, Mr.  
5 Arnett, that would have been prepared in the  
6 ordinary course of business of Canada, a piece of  
7 correspondence that, in all probability, was sent  
8 by Canada to Mr. Puil as Chairman of the Board for  
9 the Greater Vancouver Regional District? You'll  
10 have to say "yes" or "no".  
11 MR. ARNOTT: I would imagine so, yes. That's what the  
12 letter indicates, yes.  
13 Q All right. Might that be marked as the next  
14 exhibit, please?  
15 THE REGISTRAR: Exhibit 1065.  
16  
17 EXHIBIT 1065: Letter to GVRD from  
18 Environment Canada - Warning Respecting an  
19 Alleged Violation, March 20, 2011  
20  
21 Q Now, in coming to testify here today, I had asked  
22 a number of documents be placed before you and  
23 this was one of the documents. You were a member  
24 of Environment Canada from the year 2000, as I  
25 understand it; is that right?  
26 MR. ARNOTT: Yes, that's correct.  
27 Q Were you based in the Pacific Region at that time?  
28 MR. ARNOTT: No, I was not.  
29 Q Were you aware of any of the facts and  
30 circumstances that led up to this warning being  
31 issued?  
32 MR. ARNOTT: No, I would not have been.  
33 Q And I'll turn to you, Dr. Van Roodselaar. Were  
34 you aware of any of the facts and circumstances?  
35 You were working for the GVRD back in 2000, were  
36 you not?  
37 DR. van ROODSELAAR: That's correct.  
38 Q And were you aware of receiving this warning  
39 respecting an alleged violation under s. 36(3) of  
40 the **Fisheries Act**?  
41 DR. van ROODSELAAR: As I recall, I remember a letter  
42 having been received.  
43 Q The next document, which should be the very next  
44 document from our list, is a letter dated May  
45 15th, 2001 on the letterhead of Environment  
46 Canada, and the writer of that is the Regional  
47 Director General for Pacific and Yukon Region, Mr.

1 Fast.

2 Once again, the question to you, Mr. Arnott,  
3 this appears to be a letter that was sent in the  
4 ordinary course of business by Environment Canada  
5 to the City of Vancouver; is that right?

6 MR. ARNOTT: Correct.

7 Q And turning to you, Dr. van Roodselaar, were you  
8 aware of this letter on or about the time that it  
9 was received and its contents?

10 DR. van ROODSELAAR: I can't say that I was. This is a  
11 letter to the City of Vancouver. At the time I  
12 was working with the Greater Vancouver Regional  
13 District.

14 Q Okay. Were you aware -- if we look at the  
15 contents of the letter and the last -- well, the  
16 penultimate paragraph says:

17  
18 We confirm that recent inspections carried  
19 out by EC show that the Iona and Lions Gate  
20 treatment plant discharges were not in  
21 compliance with the **Fisheries Act**.

22  
23 Were you aware of that roughly around that time  
24 frame?

25 DR. van ROODSELAAR: I believe I recall that some  
26 samples were taken, yes.

27 Q All right. And the position taken by Environment  
28 Canada was that there was non-compliance as a  
29 result of those samples with respect to the Iona  
30 and Lions Gate treatment plant; is that right?

31 DR. van ROODSELAAR: That's what it says, yes.

32 MR. LEADEM: Okay. Might that be marked as the next  
33 exhibit, please.

34 THE REGISTRAR: Exhibit 1066.

35  
36 EXHIBIT 1066: Letter from D. Fast (EC) to D  
37 Clairmont (City of Vancouver) re City  
38 Council's Recommendations re the GVRD LWMP,  
39 May 15 2001  
40

41 MR. LEADEM: The next letter in that chain of letters  
42 is one dated June 14th, 2001. It's once again on  
43 the letterhead of the Environmental Protection  
44 Branch as it was then know, Environment Canada.  
45 Maybe it's still known as that, I'm not sure.

46 Q Is it, Mr. Arnott?

47 MR. ARNOTT: No, it is not.



1 Q And would you agree with me that this appears to  
2 be a letter, on its face, was sent in the ordinary  
3 course of business from Environment Canada?

4 MR. ARNOTT: Yes.

5 MR. LEADEM: Next exhibit, please.

6 THE COMMISSIONER: Are we marking that?

7 MR. LEADEM: Might that be marked as the next exhibit,  
8 please?

9 THE REGISTRAR: Oh, I'm sorry. Exhibit 1067.

10

11 EXHIBIT 1067: Letter from B. Wilson (EC) to  
12 K. Cameron (GVRD) re GVRD Liquid Waste Mgmt  
13 Plan, June 14 2001  
14

15

15 MR. LEADEM:

16

16 Q And were you aware of it, Dr. van Roodselaar, of  
17 the facts and circumstances as contained in this  
18 letter at the time that it was written?

19

19 DR. van ROODSELAAR: Yes.

20

20 Q And if we look at the last full paragraph on the  
21 first page, the author of this document, the  
22 letter, who is a Dr. -- I think it's Brian Wilson,  
23 Director, says:

24

25

As I pointed out in my letter of May 25,  
2000, compliance with subsection 36(3) of the  
**Fisheries Act** is determined on the basis of  
end-of-pipe discharges (effluent quality at  
point of discharge or last point of control).

26

27

28

29

30

31

That was your understanding of how Environment  
Canada conducted its business, particularly with  
respect to subsection 36(3) of the **Fisheries Act**;  
is that right?

32

33

33 DR. van ROODSELAAR: General practice, I believe that's  
34 so.

35

36

36 Q Now, I'd like to now turn to Exhibit 1061 if I  
37 may, and to go to page 33 of that report. Now, on  
38 its head, it appears to be "Iona Island Wastewater  
39 Treatment Plant, 2006, Annual Summary." Dr. van  
40 Roodselaar, you recognize this document, do you  
41 not?  
42

43

43 DR. van ROODSELAAR: In general, yes.

44

44 Q All right. And essentially what happens, as I  
45 understand it, on an annual basis is that the  
46 wastewater treatment plants within the GVRD or  
47 Metro Vancouver file annual summaries of the

1 results of testing at their plants; is that  
2 correct?  
3 DR. van ROODSELAAR: Yes.  
4 Q And Table 4.4-1 is the table for Iona Island WWTP  
5 for 2009; is that right?  
6 DR. van ROODSELAAR: That's correct.  
7 Q And if we can look down at the -- it appears to be  
8 two tables. If we look down at the actual second  
9 table there under the heading, "Monitoring  
10 Parameters", are you with me there, Doctor?  
11 DR. van ROODSELAAR: Excuse me, can you come again?  
12 Q The second table there.  
13 DR. van ROODSELAAR: Yes.  
14 Q The one that's now being highlighted --  
15 DR. van ROODSELAAR: Yes.  
16 Q -- "Monitoring Parameters", and the second item  
17 down, the second row, says, "Toxicity 96 hour LC50  
18 (%v/v)." That's what is known as the acute  
19 lethality test; is that right?  
20 DR. van ROODSELAAR: That's correct.  
21 Q And the frequency of testing for Iona is once a  
22 month; is that right?  
23 DR. van ROODSELAAR: That's correct.  
24 Q The sample type is a grab sample, meaning that a  
25 sample is taken from the last filter pulled before  
26 it's going out the pipe into the Strait of  
27 Georgia; is that right?  
28 DR. van ROODSELAAR: It's a grab sample from the pipe,  
29 yes.  
30 Q Okay. And under the maximum, I find the greater-  
31 than-100 -- 100 percent is what you need to  
32 achieve in order to pass; is that right?  
33 DR. van ROODSELAAR: That's correct.  
34 Q All right. And the minimum obtained during that  
35 year was 67; is that right?  
36 DR. van ROODSELAAR: That's what it says, yes.  
37 Q Okay. And you're not disputing that, are you?  
38 DR. van ROODSELAAR: No.  
39 Q And the average then for the year is less than 94;  
40 is that right?  
41 DR. van ROODSELAAR: That's correct.  
42 Q All right. So taken on an average then for the  
43 year 2009, there's a failure of the toxicity 96-  
44 hour LC50 test, the acute lethality test, at  
45 various times during the year; is that right?  
46 DR. van ROODSELAAR: Of the monthly testing, and that's  
47 correct, yes.

1 Q All right. Now, if you move on to Exhibit 1055,  
2 these are reports that were entered into evidence  
3 yesterday. You were not in the hearing room and  
4 we had the benefit of hearing advice that was  
5 proffered to us by Mr. van Aggelen, and you're  
6 familiar with Mr. van Aggelen, are you, Dr. van  
7 Roodselaar?

8 DR. van ROODSELAAR: Yes, I've met Mr. van Aggelen.

9 Q All right. And he took some time to explain to us  
10 some of these columns, and specifically the column  
11 entitled, "96 hour LC50". The first one that is  
12 up there for your perusal is one in June 2010  
13 report. Do you recognize this as a report that is  
14 produced by, in this case, Iona Island wastewater  
15 treatment plant, and produced and then posted  
16 online through the internet?

17 DR. van ROODSELAAR: That's correct.

18 Q All right. And looking down the column, we  
19 already ascertained that the 96 hour LC50 test is  
20 one that's done on a monthly basis; is that right?

21 DR. van ROODSELAAR: That's correct.

22 Q So for this particular month, that test would have  
23 occurred on it appears to be June the 22nd; is  
24 that right?

25 DR. van ROODSELAAR: Seems to be the date, yes.

26 Q All right. And the number that appears in that  
27 column is 81, which also is a failure of the acute  
28 lethality test; is that correct?

29 DR. van ROODSELAAR: That's correct.

30 Q All right. I'll do one more with you. If you  
31 want to turn to July 2010, which will be the next  
32 page, once again looking at the column entitled  
33 "96 hour LC50", and looking at the data that was  
34 obtained for the monthly test done on July the  
35 14th, 2010, I find the figure of 65, as do you; is  
36 that right?

37 DR. van ROODSELAAR: Yes.

38 Q And so that also represents a failure of the acute  
39 lethality test on that date; is that right?

40 DR. van ROODSELAAR: Yes.

41 Q And so the question is, we see that for -- with  
42 respect to the acute lethality test, as long ago  
43 as 2000 or 2001, we see failures of this  
44 particular test existing right up through 2009 and  
45 right up to 2010. Is that a fair statement?

46 DR. van ROODSELAAR: Yes.

47 Q And essentially, then, with respect to the acute

1 lethality test, what that means is that any fish  
2 that's swimming by the effluent is in trouble.  
3 It's probably going to not do well because of the  
4 oxygen demand having been taken up by the effluent  
5 from the wastewater treatment plant; is that fair  
6 to say?  
7 DR. van ROODSELAAR: No, I would dispute that  
8 statement.  
9 Q All right. Well, let's put it this way: That  
10 you're obliged - your plant, that is - is obliged  
11 to pass this test, at least in respect of  
12 compliance with Environment Canada standards; is  
13 that fair to say?  
14 DR. van ROODSELAAR: We are obliged to do that on a  
15 monthly basis based on our operating certificate  
16 with the province. What you're indicating is that  
17 Environment Canada would consider those test  
18 results to be unacceptable.  
19 Q Right. And turning now to Environment Canada, Mr.  
20 Arnott, I don't know whether you have any  
21 understanding or knowledge of this particular  
22 issue with respect to the failure of Iona to  
23 comply with the acute lethality test. Are you  
24 familiar with this issue at all?  
25 MR. ARNOTT: I'm familiar with the issue in general.  
26 Q Yes?  
27 MR. ARNOTT: Specifically relating to the cases of non-  
28 compliance, that is an issue related to  
29 Enforcement Branch.  
30 Q Yes. And what is your knowledge of what  
31 Enforcement Branch is doing, if anything, about  
32 these non-compliance with the acute lethality  
33 tests that are occurring on fairly regular basis  
34 at Iona Wastewater Treatment Plan.  
35 MR. ARNOTT: Sorry, you repeat the question?  
36 Q Yes.  
37 MR. ARNOTT: My knowledge of Enforcement Branch's  
38 activity? I would --  
39 Q Yes. Do you have any knowledge of what the  
40 Enforcement Branch position is with respect to  
41 these non-compliance issues?  
42 MR. ARNOTT: No. Enforcement Branch conducts their  
43 business in a neutral and independent way.  
44 Q All right. Has it been the subject of any  
45 discussion to your knowledge, either in the work  
46 that you do, about the fact that there seems to be  
47 a lot of failures, or a certain number of failures

1 of acute lethality test at the Iona wastewater  
2 treatment plant?

3 MR. ARNOTT: No, not specifically.

4 Q This is not mentioned to you in Environment  
5 Canada?

6 MR. ARNOTT: No, not specifically. I can say in the  
7 context of developing the regulations --

8 Q Yes.

9 MR. ARNOTT: -- and the context of the consultation  
10 we've done over a number of years, is the issue of  
11 the interpretation of 36(3), using the acute  
12 lethality test and the need for greater clarity  
13 using the **Fisheries Act** authority. We can do that  
14 by establishing regulations that express a  
15 concentration, a quantity of deleterious  
16 substances in a regulation, and that's what we've  
17 done in terms of proposing regulations under the  
18 **Act**.

19 Q But until the regulations are in place, you still  
20 have s. 36(3) of the **Fisheries Act**, correct?

21 MR. ARNOTT: Correct.

22 Q And one of the elements that has been prescribed  
23 as a deleterious substance under the provisions of  
24 that **Act**, specifically 36(3), is biological oxygen  
25 demand, BOD; is that correct?

26 MR. ARNOTT: Correct.

27 Q And so the acute lethality test, as I understand  
28 it, relates to a failure on the part of an  
29 effluent to meet the BOD test; is that fair to  
30 say?

31 MR. ARNOTT: I wouldn't say that's completely correct.  
32 There are a number of things that could express  
33 toxicity in an effluent, oxygen demand just being  
34 one of them.

35 Q Right. But more often than not, if you're dealing  
36 with sewage effluent, you're probably looking and  
37 focusing on BOD, are you not?

38 MR. ARNOTT: Perhaps. Not in all cases, though.

39 Q Okay. Well, I won't get into a quarrel with you  
40 about this, but what I'd like to know is what, if  
41 anything, is Environment Canada doing about these  
42 failures at Iona? Do you know anything about  
43 this?

44 MR. ARNOTT: No, as I said before, that would be  
45 Enforcement Branch issues to manage. In terms of  
46 what Environment Canada is doing, as I've said, we  
47 have gone through this extensive process of both

1 developing a Canada-wide strategy under the CCME  
2 with provinces and territories to reach an  
3 agreement, broadly speaking, on a harmonized  
4 regulatory framework, and we're moving ahead with  
5 regulations under the **Fisheries Act** to express  
6 that clarity that municipalities and other  
7 stakeholders have asked for under the **Fisheries**  
8 **Act**.

9 Q Okay. I'll turn to you, Dr. van Roodselaar.  
10 What, if anything, is the GVRD or Metro Vancouver  
11 doing about these failures at Iona wastewater  
12 treatment plant?

13 DR. van ROODSELAAR: Under the 2002 Liquid Waste  
14 Management Plan, there was a process put into  
15 place to work through BIEAP-FREMP with the federal  
16 government with respect to these kinds of matters.  
17 Part of what we did and do, is we do toxicity  
18 identification evaluations to determine why we  
19 might get some of these kinds of results. At the  
20 time in 2002 when the plan was approved, we were  
21 working on not just Iona. We were working on  
22 Iona, Lions Gate, Annacis, Lulu with respect to  
23 these kind of issues.

24 Q Yes.

25 DR. van ROODSELAAR: And we did our toxicity  
26 identification evaluations. In the case of  
27 Annacis and Lulu, which are secondary treatment  
28 plants, to evaluate what those results meant, what  
29 we did was we did an *in situ* bioassay at Annacis  
30 over a period of a year where we ran these tests  
31 on a regular basis over a period of a year or two,  
32 to evaluate if we were in fact seeing these kind  
33 of results that, at that time, the lab results  
34 were indicating for Annacis, and we did not. The  
35 *in situ* tests of the affluent at Annacis were  
36 fine.

37 Q You're referring specifically now to the ammonia  
38 test, are you not?

39 DR. van ROODSELAAR: Well, no, that was not the ammonia  
40 test at that time. We brought the matter to the  
41 attention of Environment Canada who then looked  
42 into it and, based on that, developed an add-on  
43 procedure which I believe is what you're referring  
44 to with respect to the ammonia. It's an add-on  
45 procedure that basically keeps the pH in the  
46 laboratory of the sample the same as it was in the  
47 effluent, so that in fact what you're looking at

1 in the laboratory is the same as the sample or the  
2 material that's present in the pipe. From then  
3 on, using that add-on procedure, as now authorized  
4 by Environment Canada, we didn't have any problems  
5 with respect to the 96 hour LC50 at Annacis and  
6 Lulu.

7 In the case of Lions Gate we again did the  
8 TIE procedure and we found out that in terms of  
9 Lions Gate, the primary issue there was  
10 surfactants --

11 Q Yes.

12 DR. van ROODSELAAR: -- that was contributing. There  
13 can be other things, but certainly the predominant  
14 issue there were surfactants. We then set up an  
15 action plan where we put in place a public  
16 education program in terms of detergents, since  
17 detergents are one of the primary sources of  
18 surfactants in a community that's primarily homes.

19 Q That services mostly homes in North Vancouver,  
20 West Vancouver.

21 DR. van ROODSELAAR: That's correct. And so we  
22 actively pursued a program there in terms of  
23 saying to people, because of the extremely soft  
24 water, the nature of the water in Metro Vancouver,  
25 that the instructions that they had on their  
26 detergent containers basically indicated dosages  
27 of detergent that were far larger than they  
28 needed, and consequently they could save money and  
29 they could then also help possibly affect the  
30 environment and these results in terms of the  
31 surfactants.

32 So we undertook that program, and we have  
33 found in the last several years that we don't have  
34 that issue at Lions Gate.

35 Q What about Iona? Don't you do TIEs at Iona?

36 DR. van ROODSELAAR: Okay. We also did the TIEs at  
37 Iona and we found there that the primary issue  
38 that we saw - there were other issues as Mr.  
39 Arnott has pointed out - but a primary issue was  
40 the fact that with the microbiological activity in  
41 the sample, in the lab, that the dissolved oxygen  
42 was dropping faster than it was replenished using  
43 the air supplementation rate in the test.

44 So consequently in the laboratory, the fish  
45 were unable to survive due to this oxygen  
46 depletion. So --

47 Q They were unable to survive in the effluent that

1           was coming out of the wastewater treatment plant,  
2           right?

3       DR. van ROODSELAAR: Well, when you say they were  
4           unable to survive in the effluent coming out of  
5           the wastewater treatment plant, we had an  
6           extensive monitoring program in the receiving  
7           environment, i.e. around the point of discharge,  
8           and we didn't have any issues at that location.  
9           So in terms of the receiving environment,  
10          certainly that issue was not reflected.

11       Q     Have you been in some discussions with Environment  
12           Canada enforcement agents, and so forth, about  
13           this issue and have there been some discussions  
14           amongst yourself and members of GVRD and Canada  
15           Enforcement (sic) around these issues?

16       DR. van ROODSELAAR: We have reported our actions. We  
17           reported our efforts over that period of time  
18           starting back in 2002 through the BIEAP-FREMP  
19           mechanism --

20       Q     Yes.

21       DR. van ROODSELAAR: -- as indicated in the Liquid  
22           Waste Management Plan that was approved at that  
23           time, and so those discussions occurred at that  
24           table.

25       Q     Isn't it true that the only way that we can really  
26           get rid of this problem with acute lethality  
27           coming out of the effluent at Iona wastewater  
28           treatment plant is to move to a secondary  
29           treatment? That's a safe bet. That's probably  
30           going to do it for you; isn't that fair to say?

31       DR. van ROODSELAAR: Well, I would have to take issue  
32           with your first statement, the first part of your  
33           statement, which you said was "only way" to do it  
34           was to --

35       Q     Well, the --

36       DR. van ROODSELAAR: -- do the secondary --

37       Q     Let's say that it's the safest way to do it. It's  
38           the most -- it's the most precautionous way to do  
39           it.

40       DR. van ROODSELAAR: I'm not sure what you mean by  
41           that.

42       Q     All right.

43       DR. van ROODSELAAR: The safest most precautionous way  
44           of --

45       Q     Well, let's not quibble about words. Let me just  
46           say it plainly then. That if Iona goes to  
47           secondary treatment, the prospects of encountering



1 an acute lethality test, the LC50 test, are  
2 lessened as a result of that.

3 DR. van ROODSELAAR: I would say that's probably  
4 likely, yes.

5 But I guess the other issue that we were  
6 looking at, at the time, was within the context of  
7 the facility we had there, whether we could take  
8 other actions, and one thing we looked at, in  
9 terms of effluent - not receiving environment -  
10 effluent was that if we disinfected the effluent  
11 with chlorine, we could in fact create a condition  
12 where that test would be -- of the end-of-pipe  
13 sample would be effectively passed.

14 However --

15 Q I'm sorry.

16 DR. van ROODSELAAR: I was going to say however we took  
17 that to the Environmental Monitoring Committee who  
18 advised us that we should actually have  
19 discussions with Environment Canada in terms of,  
20 you know, the ongoing process, rather than going  
21 to that solution, even though that solution is  
22 perfectly acceptable within a regulatory  
23 framework. They felt that that was not probably  
24 the best way to manage the issue at that time.

25 Q You understand that this Commission's work is all  
26 about sockeye salmon and about conserving sockeye  
27 salmon and trying to find out what's caused the  
28 decline and, to some extent, we've heard some  
29 evidence yesterday, from some of the notable  
30 doctors who preceded you to that podium,  
31 concerning the sockeye and what effects, if  
32 anything --- or could be visited upon the sockeye  
33 by virtue of some of these endocrine disruptors,  
34 some of the brominated --- polybrominated flame  
35 retardants, things of that nature.

36 What specifically are you doing at Iona and  
37 other wastewater treatment plants to rectify those  
38 issues, to make the world a safer place for  
39 sockeye salmon by dealing with polybrominated  
40 flame retardants, by dealing with endocrine  
41 disruptors by these emerging chemicals of concern.

42 DR. van ROODSELAAR: Okay. If I can take them sort of  
43 in order there, as far as the PBDEs, the flame  
44 retardants, this is a substance that does not lend  
45 itself well to wastewater treatment plant  
46 treatment. In fact, what we did there, and I  
47 believe others did as well, communicated to the

1 federal government that this was a material that,  
2 like the PCB material of past, was the kind of  
3 material that was best managed by prohibition.

4 In fact, that has now happened where the  
5 federal government has put in that prohibition to  
6 come into effect over a period of time, but that  
7 action has been taken. So the recognition was  
8 there that this was a substance that was not best  
9 managed at a wastewater treatment plant location,  
10 but best dealt with by prohibition.

11 Q But before you move off of that, the problem with  
12 the PBDEs is that they're persistent and that they  
13 tend to biomagnify in trophic levels; is that  
14 right?

15 DR. van ROODSELAAR: I think that's correct. I'm not  
16 an expert, but certainly I believe that's correct,  
17 yes.

18 Q So even though the problem may be solved by  
19 banning these substances, we still are going to  
20 see them appear in the environment for some time.

21 DR. van ROODSELAAR: Unfortunately, that is so.

22 Q All right. And I don't want to belabour the  
23 point, but essentially what I'm interested in  
24 finding out is -- or arriving at are solutions.  
25 I've heard some evidence this morning from Dr. --  
26 or from Mr. Arnott about the possible solutions  
27 coming by way of these new regulations that are  
28 coming into vogue.

29 The solutions that I seem to be hearing from  
30 you, Dr. van Roodselaar, is that there is some  
31 commitment now being made by the board to ramp up  
32 and go to at least secondary treatment at Iona  
33 sewage treatment plant; is that right?

34 DR. van ROODSELAAR: That's correct.

35 Q All right.

36 DR. van ROODSELAAR: And so that's actually in our  
37 Liquid Waste Management Plan. When I mentioned  
38 that, I referred to our new Liquid Waste  
39 Management Plan where that is stated.

40 Q And essentially, as I understand it, I mean the  
41 problem hasn't been one of "we lack the  
42 technology" to deal with some of these issues, but  
43 rather "we lack the money". I mean, if we had the  
44 money presumably a wastewater treatment plant to  
45 the quaternary level might be in place in Iona,  
46 right? So it comes down to a question of funding  
47 all the time, doesn't it?

1 DR. van ROODSELAAR: I would say, and I can't speak on  
2 behalf of the board, but I would say they have  
3 certainly expressed that funding was a significant  
4 issue for them.

5 Q Now, in the document, the CCME - and I might ask  
6 Commission counsel to help me with respect to the  
7 exhibit number on that document - I think it was  
8 Tab 5 of your brief. I know it's been an exhibit.

9 MR. MCGOWAN: Exhibit 1058.

10 MR. LEADEM: Exhibit 1058.

11 Q I think there was some funding information that  
12 was presented at pages 7 and 8. I think if you go  
13 to page 8 there's actually a table. That's it,  
14 Table 1.

15 So "Potential Funding Mechanisms", and this  
16 is rather rough, is it not, Mr. Arnott? It's  
17 basically an overview of what to do if you need  
18 money and you're a municipality and you need to  
19 find some money for wastewater treatment plants.  
20 Essentially, the big item in that table, I'm going  
21 to suggest to you, are the capital costs; is that  
22 right?

23 MR. ARNOTT: Yes.

24 Q And under the "Potential Sources" we have "Own  
25 source revenue" which, I take it, Dr. van  
26 Roodselaar, would be money coming from taxpayers  
27 in Greater Vancouver to fund their plant; is  
28 that...?

29 DR. van ROODSELAAR: For Iona, that would be certainly  
30 a major part of it --

31 Q Yes.

32 DR. van ROODSELAAR: -- coming through the municipality  
33 of Vancouver to Metro Vancouver for funding the  
34 infrastructure, that's correct.

35 Q Right. Another source identified there is  
36 provincial funding. Have you approached the  
37 province to obtain funding for upgrading?

38 DR. van ROODSELAAR: I believe those discussions are  
39 ongoing with the province.

40 Q And are you at liberty to tell us are they likely  
41 to bear fruit or not?

42 DR. van ROODSELAAR: I guess I would refer to the  
43 letter from the Minister when he approved the  
44 Liquid Waste Management Plan, the new Liquid Waste  
45 Management Plan where he indicates that the  
46 upgrades shall proceed, not contingent on funding.

47 Q Right.

- 1 DR. van ROODSELAAR: However, he encourages Metro  
2 Vancouver to continue to seek funding from the  
3 levels of government, senior levels of government.
- 4 Q All right. And you already indicated that you've  
5 approached the federal infrastructure for funding  
6 and those talks are ongoing; is that right?
- 7 DR. van ROODSELAAR: That was indicated. Mr. Arnott in  
8 fact recognized that that was there.
- 9 Q What about this other heading, "Other Innovative  
10 Funding Mechanisms". Has the board considered any  
11 other type of funding mechanisms, going to a  
12 referendum or some special vote from the people in  
13 Vancouver who may be willing to pay for a cleaner  
14 environment?
- 15 DR. van ROODSELAAR: I think in either way, I mean,  
16 what you're stating is if it's "own source  
17 revenue" or that mechanism you just indicated, in  
18 either case, it would have to come from the  
19 citizens of Vancouver.
- 20 MR. LEADEM: Okay. In the interest of time, I'm going  
21 to move on to another topic, and I should have  
22 said I asked for two hours; I got 40 minutes, Mr.  
23 Commissioner, so I'm really getting stretched  
24 here.
- 25 Q I want to go to Exhibit 1048, if I could. These  
26 questions will be to you, Mr. Arnott. This is a  
27 memo that was prepared from a number of your DFO  
28 scientists in toxicology, Rob Macdonald, and Dr.  
29 Ross spoke to this. Are you familiar with this  
30 memo?
- 31 MR. ARNOTT: I am not.
- 32 Q So that takes me a little bit by surprise, because  
33 as I understand it, you're basically the point  
34 person for the development of the regulations, the  
35 wastewater regulations. Do I have that fair?
- 36 MR. ARNOTT: That's correct. DFO did submit formal  
37 comments to us, but these were not them.
- 38 Q All right. Do you know why this document did not  
39 get into your mix?
- 40 MR. ARNOTT: I do not know. You'd have to ask DFO.
- 41 Q All right. Dr. Ross testified yesterday about  
42 submitting these in a compressed time frame. Do  
43 you know why there was such a compressed time  
44 frame to getting internal reviews from your own  
45 colleagues from within DFO in terms of the import  
46 and the impact of these draft regulations and  
47 draft wastewater regulations?

1 MR. ARNOTT: No, I can't comment on that specifically.  
2 There was ample time to provide comments. I can't  
3 speak to why they would have been perceived as  
4 compressed.

5 Q All right. From your perspective, do you know  
6 when the draft started to get -- to be circulated  
7 internally? By "internally" I mean within federal  
8 governmental departments?

9 MR. ARNOTT: Well, if you step back and think about the  
10 context of what the regulations contemplated,  
11 there was five years of consultation on the CCME  
12 Canada-wide strategy that contemplated national  
13 baseline standards of secondary wastewater  
14 treatment that we had indicated through that  
15 process that we'd be reflecting in a regulation  
16 under the **Fisheries Act**. There was quite a bit of  
17 consultation even leading up to contemplating  
18 specific regulatory provisions in a draft  
19 regulation.

20 Q All right. And so that confuses me, then, because  
21 if you're saying that there's a five-year lead-in  
22 to the promulgation of the draft regulations, even  
23 before they're drafted, why is Environment Canada  
24 not talking to DFO in terms of what import or what  
25 kind of review should be done in terms of DFO  
26 scientists having some impact and having some  
27 input into this whole drafting exercise?

28 MR. ARNOTT: Well, I would say that there was extensive  
29 dialogue all the way through the process, in terms  
30 of input, both on the CCME Canada-wide strategy.  
31 That process was certainly open to input from  
32 stakeholders in general as well as federal  
33 scientists. As well, as we moved from developing  
34 and finalizing the CCME Canada-wide strategy  
35 towards the development of regulations in the  
36 **Fisheries Act**, there's been ongoing communication  
37 with DFO.

38 MR. LEADEM: I see my time is up, Mr. Commissioner. I  
39 could go on for hours, but unfortunately, we don't  
40 have that luxury.

41 THE COMMISSIONER: Thank you, Mr. Leadem.

42 MS. BROWN: Thank you, Mr. Commissioner. For the  
43 record, Anja Brown, and with me is Crystal Reeves.  
44 We've been allotted 20 minutes today.

45 Quickly, as a matter of housekeeping, Mr.  
46 Commissioner, Ms. Reeves and I will excuse  
47 ourselves during the break, and Ms. Pence will be

1 here for the remainder of the afternoon on gravel  
2 removal, and she'll be here tomorrow as well with  
3 Ms. Gaertner.  
4

5 CROSS-EXAMINATION BY MS. BROWN:  
6

7 Q Mr. Arnott and Dr. Roodselaar, we're counsel for  
8 the First Nations Coalition. The Coalition is  
9 comprised of a number of Fraser River First  
10 Nations, Fraser River aboriginal fishing  
11 organization, the Council of Haida Nation and also  
12 some of the Douglas Treaty First Nations.

13 My first questions go to you, Dr. Arnott --  
14 or Mr. Arnott, rather. According to the PPR and  
15 some of the other documents that have been  
16 provided by the Commission, the proposed  
17 regulations that have been the subject of some  
18 discussion today were subject to years of  
19 consultation, and you told us moments ago that was  
20 approximately five years. I'm wondering whether  
21 First Nations were a formal part of that  
22 consultation?

23 MR. ARNOTT: That's a good question. In terms of  
24 consultation specifically on the regulations, I  
25 should qualify that. I spoke to the consultation  
26 that primarily happened around the development the  
27 CCME Canada-wide strategy which, through that  
28 process of -- always indicated they used that as  
29 the basis for developing regulations under the  
30 **Fisheries Act**.

31 So within that context, yes, we did directly  
32 engage First Nations aboriginal communities  
33 through that process, specifically from a federal  
34 perspective. There was extensive cross-Canada  
35 consultations that were conducted in late 2007,  
36 early 2008 that included not only the national  
37 aboriginal organizations, but also communities  
38 across the country. I think we conducted 13  
39 consultation sessions in communities themselves  
40 across the country.

41 In that context, it was primarily on the CCME  
42 Canada-wide strategy and we also conducted  
43 consultations specifically about how Environment  
44 Canada was going to implement the CCME strategy  
45 through regulations under the **Fisheries Act** as  
46 well as other things that we were contemplating at  
47 that point.

1 Q All right. And we've heard that one of the  
2 purposes of the strategy and the new regulations  
3 is to ensure harmonization nationally. Do I have  
4 it that the regulations, once approved, will apply  
5 on Indian reserves?

6 MR. ARNOTT: That's correct.

7 Q Has the capacity of First Nations communities, and  
8 particularly those in isolated areas, to meet the  
9 requirements of these new regulations been a topic  
10 of discussion by Environment Canada?

11 MR. ARNOTT: Yes, I would say that's one of the broad  
12 themes that was identified through the  
13 consultation even going back to 2007, 2008, was  
14 the issue of capacity within First Nations  
15 aboriginal communities to not only upgrade  
16 wastewater treatment systems themselves to comply  
17 with the effluent quality standards as well as the  
18 capacity issue to respond to the additional  
19 requirements in the regulations even such things  
20 as basic monitoring and reporting that's required  
21 under the regulations. The capacity for  
22 communities just to do that was also identified as  
23 a key issue for them.

24 Q And would building that type of capacity be part  
25 of Environment Canada's responsibility or would it  
26 be solely Indian Affairs?

27 MR. ARNOTT: Indian Affairs.

28 MS. BROWN: All right. Mr. Lunn, could you please  
29 bring up Commission document 31?

30 Now, you've indicated earlier today that, as  
31 a part of -- this isn't the -- could I have a  
32 moment, please, Mr. Commissioner? Sorry, Mr.  
33 Commissioner, there's some confusion with respect  
34 to the documents so I'll move on to some other  
35 questions that I have.

36 Mr. Lunn, could you please turn up the PPR  
37 number 15 at page 26?

38 Q Mr. Arnott, this is a question that I'll direct at  
39 you. Paragraph 63 tells us about the municipal  
40 water and wastewater surveys that Environment  
41 Canada engages in, in all Canadian municipalities  
42 serving populations of 1000 or more, excluding  
43 First Nations communities. We see there that the  
44 survey discusses water sources, water use,  
45 conservation and wastewater treatment, and that  
46 it's a survey that's conducted every two or three  
47 years.

1                   So my question is whether there's anything  
2                   equivalent to this type of a survey that's  
3                   undertaken by Environment Canada and First Nations  
4                   communities?

5       MR. ARNOTT: Environment Canada wouldn't conduct that  
6                   kind of survey for First Nations, but Indian and  
7                   Northern Affairs Canada would have that  
8                   information, and we are working with them in terms  
9                   of understanding existing levels of treatment in  
10                  First Nations' communities and contemplating the  
11                  impact of the regulations there.

12       Q       And does Environment Canada engage in any fashion  
13                  with First Nations with respect to wastewater  
14                  issues?

15       MR. ARNOTT: I'm not sure of the context of your  
16                  question. Existing right now with direct --

17       Q       With existing right now, or upgrading to existing  
18                  facilities?

19       MR. ARNOTT: Well, I can say that beyond consultations  
20                  that have occurred and working with -- continue to  
21                  work with national aboriginal organizations in  
22                  terms of our next steps in the process of  
23                  establishing and implementing the regulations, I  
24                  think historically there's been the context of  
25                  federal guidelines that have been in place for  
26                  wastewater treatment, wastewater management, for  
27                  federal departments, and that's certainly been a  
28                  bit of a backbone in terms of guidance to the  
29                  levels of treatment that are expected.

30                  I'm specifically talking about a 1976 federal  
31                  guideline that's existed, and even within those  
32                  guidelines, a baseline of secondary wastewater  
33                  treatment has been provided as guidance to be  
34                  expected for federal departments.

35       Q       All right. My next series of questions are for  
36                  you, Dr. Roodselaar.

37       MS. BROWN: Mr. Lunn, could you turn up exhibit 1050,  
38                  please?

39       Q       So this is, of course, the letter from the  
40                  Minister approving the latest management plan. If  
41                  we could go to condition number 10, please, on  
42                  page 3, which is the list of imposed changes that  
43                  the Minister has attached to the letter in the  
44                  approval of the management plan. Condition 10  
45                  requires Metro Vancouver to continue to consult  
46                  with First Nations during the implementation of  
47                  the plan, it says, in particular engaging is



1 appropriate with First Nations likely to be  
2 impacted.

3 Is part of the work that you do, Dr.  
4 Roodselaar, are you at all involved in  
5 consultation with First Nations?

6 DR. van ROODSELAAR: Not me personally, but I know  
7 Metro Vancouver considered this a necessary piece  
8 of the business in undertaking the upgrades even  
9 prior to the Minister's conditions, so I'm  
10 certainly aware that those are our full  
11 expectation, that this would be part of the  
12 process.

13 Q And which First Nations does Metro Vancouver  
14 ordinarily consult with?

15 DR. van ROODSELAAR: It depends, of course, in terms of  
16 -- it says "likely to be impacted by the secondary  
17 upgrades". So the ones in the proximity of the  
18 facilities in question would be the ones that I  
19 would expect that they would be dealing with.  
20 Certainly that's been the general understanding  
21 that I have with respect to other projects as  
22 well.

23 Q And do you agree that all Fraser River First  
24 Nations will potentially be affected, hopefully in  
25 a positive way, by these secondary upgrades once  
26 they've been implemented?

27 DR. van ROODSELAAR: What's implicit in that statement  
28 is that these upgrades will have a significant  
29 effect on Fraser River water quality. I don't  
30 think that that is necessarily the case. So if  
31 you're looking at which Nations are going to be  
32 impacted, I would think it's more likely that  
33 you're looking at the ones that are in close  
34 proximity to the facilities, and therefore the  
35 consequences around the facility upgrade  
36 themselves or the likely pieces that are relevant  
37 here.

38 Q All right. Now, this morning you answered some  
39 questions in relation to the terms of reference  
40 for the Environmental Monitoring Committee.

41 MS. BROWN: And if we could have Exhibit 1064, please,  
42 Mr. Lunn.

43 Q Page 3 of the exhibit sets out the proposed  
44 membership, and I note that this document is from  
45 2001 so it's ten years ago.

46 DR. van ROODSELAAR: Yes.

47 Q The membership list there doesn't include First

1 Nations representatives, and my question is  
2 whether the actual membership of that  
3 Environmental Monitoring Committee now includes  
4 any First Nations representatives?

5 DR. van ROODSELAAR: Not at the present time, no, it  
6 does not.

7 Q And why would that be?

8 DR. van ROODSELAAR: The only answer I can give you is  
9 that the membership of that committee is  
10 representative of this proposed membership list.  
11 That was not altered or has not been changed up to  
12 the present time.

13 Q Do you agree, Dr. Roodselaar, that First Nations'  
14 participation in this sort of a committee would be  
15 important, especially when one considers the close  
16 proximity of Indian reserves to both the Lions  
17 Gate and the Iona treatment plants?

18 DR. van ROODSELAAR: Well, this committee here is not  
19 just dealing with Iona and Lions Gate water  
20 treatment plants, but it's dealing with the  
21 overall environmental monitoring program.  
22 However, that doesn't mean I take issue with your  
23 statement in the sense of the fact that a First  
24 Nation representative on this committee might be  
25 appropriate.

26 Q Right. Also in response to questions this morning  
27 posed by Mr. McGowan about the timing of the  
28 upgrades, you noted that Metro Vancouver has many  
29 issues that it needs to deal with, with respect to  
30 the timing of the upgrading, including planning,  
31 design, funding. You said land issues and you  
32 also said First Nations issues. Do you recall  
33 that?

34 DR. van ROODSELAAR: Yes, I do.

35 Q What specific First Nations issues are you  
36 referring to?

37 DR. van ROODSELAAR: Well, I think if you refer to the  
38 last condition in the Minister's letter, the whole  
39 question of consultation, and in that  
40 consultation, dealing with any issues that are  
41 pertinent to the First Nations would have to be  
42 addressed.

43 Now, I think on the North Shore, there were  
44 some issues around the location of the current  
45 wastewater treatment plan, the Lions Gate plan, so  
46 I can't speak in particular, but I can certainly  
47 state that in general, since I don't personally --

1 haven't been dealing with those pieces.

2 MS. BROWN: Mr. Commissioner, may I have a moment,  
3 please, with respect to the document? Those are  
4 my questions, Mr. Commissioner. Thank you.

5 THE COMMISSIONER: Thank you very much, Ms. Brown.

6 MR. MCGOWAN: Yes, Mr. Commissioner, just a brief  
7 question in re-examination, a couple of questions,  
8 Mr. Arnott, will be directed to you.

9

10 RE-EXAMINATION BY MR. MCGOWAN:

11

12 Q Could we please have Exhibit 1047 up and the  
13 ringtail page number 13 is what I'm looking for,  
14 the bottom left quarter of the page under  
15 "Regulatory Measures".

16 Mr. Arnott, you recall being taken to this  
17 section of the RIAS by counsel for Canada?

18 MR. ARNOTT: Yes.

19 Q Okay. I'm just going to read you the first  
20 sentence there:

21

22 Regulations were considered to be the best  
23 option for achieving the objective of  
24 reducing the risks to ecosystem health,  
25 fisheries resources and human health posed by  
26 wastewater effluent.

27

28 Is that statement, in part, an acknowledgement of  
29 Canada's obligation to protect fisheries  
30 resources?

31 MR. ARNOTT: I would say that it reflects the authority  
32 you have under the **Fisheries Act**, yes.

33 Q It is Canada who is vested with the responsibility  
34 and the jurisdiction to protect fisheries  
35 resources, correct?

36 MR. ARNOTT: Correct.

37 Q And that, of course, includes Fraser sockeye which  
38 is the subject matter of this inquiry.

39 MR. ARNOTT: Correct.

40 Q In the crafting of the regulations, Canada could,  
41 if it saw fit, prescribe higher levels of  
42 treatment requirements for particularly sensitive  
43 or important receiving environments, could it not?

44 MR. ARNOTT: It could.

45 Q We had some scientists here yesterday, a couple of  
46 whom gave evidence about the benefits of higher,  
47 more advanced treatments to marine life and

1 specifically sockeye. You've heard today the  
2 witness from Metro Vancouver give evidence that  
3 the plan for at least one of the treatment  
4 facilities is to go to secondary, and at least  
5 part of the explanation for that is that's what's  
6 required. That's what Canada has told us is the  
7 level that we have to go to.

8 Given that state of affairs, should Canada  
9 perhaps not be considering in the regulations  
10 identifying particular types of receiving  
11 environments or receiving environments that  
12 contain particularly significant resources, such  
13 as sockeye, and mandating a higher level of  
14 protection for those receiving environments in the  
15 regulations?

16 MR. ARNOTT: I'm not sure if I followed your question.  
17 Should Canada contemplate a different structure in  
18 the regulations for particular receiving  
19 environments?

20 Q Yes.

21 MR. ARNOTT: Is that generally your question?

22 Q Yes.

23 MR. ARNOTT: That's certainly been an issue that we've  
24 heard through consultation. In terms of the  
25 construct of this CCME Canada-wide strategy, the  
26 broad outcomes of achieving secondary wastewater  
27 treatment, in itself, in our view, has a  
28 significant outcome not just on reducing  
29 pollutants in general from no treatment or just  
30 primary treatment to secondary treatment. As an  
31 unintended outcome, secondary treatment does have  
32 significant outcomes as it relates to emerging  
33 substances as well.

34 Beyond the issue of what to do with some of  
35 the substances that may be posing harm, I think  
36 that's an issue for a longer term discussion.

37 MR. MCGOWAN: Thank you. Mr. Commissioner, those are  
38 my questions. I'm going to suggest, subject to  
39 any questions you may have or re-examination by  
40 Mr. East, that we take a short break and allow  
41 those counsel that are exchanging places for the  
42 next topic to accomplish that.

43 THE COMMISSIONER: Very well. Thank you.

44 MR. MCGOWAN: Thank you.

45 THE REGISTRAR: The hearing will now recess for ten  
46 minutes.

1 (PROCEEDINGS ADJOURNED FOR AFTERNOON RECESS)  
2 (PROCEEDINGS RECONVENED)  
3

4 THE REGISTRAR: The hearing is now resumed.

5 MS. BAKER: Thank you, Mr. Commissioner. It's Wendy  
6 Baker for the Commission, and today we have Dr.  
7 Laura Rempel and Dr. Marvin Rosenau which are the  
8 first panels to deal gravel removal. Before we  
9 begin with the witnesses, though, I would like to  
10 mark the Policy and Practice Report that was  
11 prepared for this portion of the hearings. It's  
12 dated May 20, 2011, and it's entitled, "Gravel  
13 Removal in the Lower Fraser River."

14 THE REGISTRAR: That will be PPR number 16.

15  
16 PPR-16: Policy and Practice Report, Gravel  
17 Removal in the Lower Fraser River, May 20,  
18 2011  
19

20 MS. BAKER: Thank you. All right. These witnesses  
21 haven't testified before. Could they both be  
22 sworn?  
23

24 LAURA REMPEL, affirmed.

25  
26 MARVIN ROSENAU, affirmed.  
27

28 THE REGISTRAR: State your name, please.

29 DR. REMPEL: Laura Rempel.

30 DR. ROSENAU: Marvin Rosenau.

31 THE REGISTRAR: Thank you. Counsel?

32 MS. BAKER: Thank you.  
33

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

36 Q I'll start with you, Dr. Rempel. If I could have  
37 your c.v. put up on the screen, please. It's Tab  
38 number 1. Thank you. First of all, that is your  
39 c.v.?

40 DR. REMPEL: It is.

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

42 THE REGISTRAR: Exhibit 1068.  
43

44 EXHIBIT 1068: *Curriculum vitae* of Laura  
45 Rempel  
46

47 MS. BAKER: Okay. Thank you.

- 1 Q You have a Ph.D. in physical geography and your  
2 dissertation in that degree was on physical and  
3 ecological organization in large gravel bed rivers  
4 and responses to disturbances by gravel mining,  
5 and it's all in the Fraser River; is that right?
- 6 DR. REMPEL: Yeah, that's correct.
- 7 Q Okay. And I'm just looking at your c.v., you  
8 identify that -- well, first of all, presently,  
9 you're working as a habitat biologist with the  
10 Department of Fisheries and Oceans?
- 11 DR. REMPEL: Yeah, that's correct.
- 12 Q Prior to that, you were a research scientist with  
13 DFO and led research programs in habitat risk  
14 assessment, aquatic bio-monitoring and fish  
15 habitat?
- 16 DR. REMPEL: That's right. Yes, correct.
- 17 Q And you have worked in stream and river  
18 environments for over 15 years, focussing on fish  
19 habitat interactions, habitat productivity and the  
20 physical and hydrological aspects of productive  
21 fish habitat, correct?
- 22 DR. REMPEL: Yeah, correct.
- 23 Q All right. Before you were a habitat biologist,  
24 you were an environmental analyst and also a river  
25 systems ecologist?
- 26 DR. REMPEL: Correct.
- 27 Q And on pages 2 and 3 of your c.v., the  
28 publications relevant to this topic are set out,  
29 relevant to your work, I should say, are set out?  
30 The first one under "Refereed publications," is a  
31 paper that you wrote with Dr. Michael Church,  
32 which was published in 2009, and is entitled,  
33 "Physical and ecological responses to disturbances  
34 by gravel mining in large alluvial river"?
- 35 DR. REMPEL: Yeah, correct.
- 36 Q And that has direct application to the Fraser  
37 system; is that right?
- 38 DR. REMPEL: Yes, correct.
- 39 Q You have also, if I move to your reports under  
40 "Technical/Professional Reports," on page 3, a  
41 paper also prepared with Dr. Church in 2003,  
42 called "The Harrison Bar gravel removal  
43 experiment: final report." That was while you  
44 were still a student; is that right?
- 45 DR. REMPEL: Yeah, that's correct.
- 46 Q Okay. And moving to page 4, I see a report that  
47 you did with Weatherly called "2003 Fraser River

1 potential gravel removals," and that was prepared  
2 by Kerr Wood Leidal for the B.C. Ministry of  
3 Water, Land, and Air Protection?

4 DR. REMPEL: Yes, correct.

5 Q And also another work with Dr. Church called,  
6 "Morphological and habitat classification of the  
7 Lower Fraser River gravel-bed reach," and that was  
8 also prepared while you were a student; is that  
9 right?

10 DR. REMPEL: That's right.

11 Q All right.

12 MS. BAKER: Mr. Commissioner, I'll ask for both of  
13 these witnesses to be qualified as experts, but  
14 I'll first go through the qualifications of Dr.  
15 Rosenau next, and then I'll ask them to be  
16 qualified together.

17 Q Dr. Rosenau, your c.v. is at Tab 19? Okay. Is  
18 that your c.v.?

19 DR. ROSENAU: That's correct.

20 MS. BAKER: If I could have that marked, please?

21 THE REGISTRAR: Exhibit 1069.

22

23 EXHIBIT 1069: *Curriculum vitae* of Dr. Marvin  
24 Rosenau

25

26 MS. BAKER: Okay.

27 Q All right. You have a Ph.D. in fisheries science;  
28 is that right?

29 DR. ROSENAU: A DPhil. Same thing.

30 Q Okay. And you have a Masters of Science in  
31 zoology, as well?

32 DR. ROSENAU: That's correct.

33 Q Okay. You have -- you were previously with the  
34 Ministry of the Environment, also known as  
35 Ministry of Water, Land and Air Protection for the  
36 B.C. Government from 1991 to 2006?

37 DR. ROSENAU: That's correct.

38 Q And in that role, you were involved in reverse  
39 sediment management and development of impacts on  
40 floodplains, and you can see that referenced on  
41 page 2, at the top of your resume?

42 DR. ROSENAU: That's correct.

43 Q And in that work, did you engage in work involving  
44 the gravel reach of the Fraser River?

45 DR. ROSENAU: That's right. I sat on the technical  
46 committee, basically referred to as the Gravel  
47 Committee of the Fraser, in addition to a number

1 of other watersheds, the Vedder, Chilliwack, et  
2 cetera.

3 Q Okay. And turning to page 4 of your CV, your  
4 publications are set out. And looking at under  
5 "Primary Scientific Journals," can you identify  
6 which of these are relevant to Fraser River gravel  
7 reach and fish habitat in the gravel river?

8 DR. ROSENAU: The Perrin, Rempel and Rosenau, 2003. To  
9 a lesser degree, the Veinott paper, which dealt  
10 with sturgeon, and that's predominantly the ones  
11 in the refereed publication.

12 Q Okay. And then under "Symposia," there's a number  
13 of other works which are relevant to the Fraser  
14 River gravel reach, I take it, and fish habitat in  
15 that area?

16 DR. ROSENAU: Most of the sturgeons, and some of the  
17 reports with Mark Angelo for the Pacific Fisheries  
18 Resource Conservation Council, one in particular  
19 on sand and gravel removal.

20 Q All right. If I can add, that's on page 6, is it?

21 DR. ROSENAU: It might be as far back as -- or far down  
22 as that, yeah.

23 Q Okay. So if you can identify which documents  
24 those are. I can see third from the bottom, under  
25 the Pacific Fisheries Resource title is a document  
26 with you and Dr. Angelo, "Sand and gravel  
27 management and fish-habitat protection in British  
28 Columbia salmon and steelhead streams," is that  
29 the one you're referring to?

30 DR. ROSENAU: Yes, much of that dealt with the Fraser  
31 River. Second from the top, Rosenau and Angelo,  
32 2007, also dealt with that issue, as well,  
33 specific to the Fraser and the gravel reach.

34 Q Okay. And then moving on to technical reports and  
35 articles, second from the top is an article or a  
36 report that you prepared with Dr. Church and  
37 Ellis, 2004, "Characterization of 4 floodplain  
38 side channels of the lower Fraser River"?

39 DR. ROSENAU: That's correct. It was a student that I  
40 was co-supervising with Dr. Church.

41 Q Okay. Have you supervised any other Ph.D. theses  
42 or work by students on the gravel reach?

43 DR. ROSENAU: Laura Rempel's, sitting beside me, at the  
44 Ph.D. level.

45 Q Any others?

46 DR. ROSENAU: No.

47 Q Okay. And I should identify, Dr. Rempel, your



1 thesis is actually in the Commission's documents  
2 at Tab 2, and it's titled, "Physical and  
3 ecological organization in a large gravel bed  
4 river and response to disturbance," and what was  
5 the subject of that, in layman's terms?

6 DR. REMPEL: The focus of my thesis was looking at the  
7 physical habitat characterization of the gravel  
8 reach in the Fraser River, and characterizing the  
9 ecological communities associated with these  
10 habitats.

11 Q And are either of you fluvial geomorphologists?

12 DR. ROSENAU: Go ahead.

13 DR. REMPEL: No.

14 DR. ROSENAU: No, but I've interacted with quite a few  
15 over the years so I do have some level of  
16 understanding which I would suggest Laura probably  
17 does, too, but I don't want to put words in her  
18 mouth.

19 DR. REMPEL: Yes, I carried out my Ph.D. in the  
20 Department of Geography at UBC and studied  
21 directly with Dr. Michael Church, who is one of  
22 the pre-eminent fluvial geomorphologists in the  
23 province. So I have training in that, but I  
24 wouldn't say that's my realm of expertise.

25 Q All right. And terms of habitat and impacts on  
26 habitat by fluvial geomorphology and hydrology, is  
27 that within your area of expertise? Do you use  
28 that knowledge in assessing habitat impacts in  
29 your work?

30 DR. REMPEL: Yes, directly.

31 Q Dr. Rosenau?

32 DR. ROSENAU: Same for me.

33 MS. BAKER: Mr. Commissioner, I'd like both of these  
34 witnesses qualified as experts in two areas, one  
35 freshwater fish habitat and flowing waters and  
36 rivers, with an emphasis in the Lower Fraser, and  
37 second, experts in fluvial geomorphology and  
38 hydrology as those relate to freshwater aquatic  
39 ecosystems and flood profiles.

40 MR. SPIEGELMAN: Mr. Commission, for the record, it's  
41 Jonah Spiegelman for the Government of Canada. I  
42 just want to be clear on the record what the  
43 extent of the qualifications for these two  
44 witnesses are, and I have a couple of questions  
45 that I'd like to put to them in that regard  
46  
47

1 CROSS-EXAMINATION ON QUALIFICATIONS BY MR. SPIEGELMAN:

2

3 Q First, do either of you have any academic training  
4 in hydraulic engineering?

5 DR. REMPEL: No, not directly.

6 DR. ROSENAU: Not directly, either.

7 Q And no professional experience as hydraulic  
8 engineers?

9 DR. REMPEL: No.

10 DR. ROSENAU: Well, I have managed hydraulic  
11 engineering studies so I have had hydraulic  
12 engineers work for me and so by association, I do  
13 have some experience, but I'm not a hydraulic  
14 engineer.

15 Q No, and you've already stated that you're not a  
16 fluvial geomorphologist proper?

17 DR. ROSENAU: Not a registered professional fluvial  
18 geomorphologist.

19 Q Okay. Thank you. Do you have any training or  
20 work experience in the area of flood risk  
21 management?

22 DR. ROSENAU: Could you define "flood risk management"?

23 Q Devising strategies or assessing strategies as  
24 pertaining to managing a flood risk in a river  
25 system?

26 DR. ROSENAU: Well, I sat on gravel committees vis-à-  
27 vis flood risk so that is my experience. So both  
28 the Fraser River Technical Committee and the  
29 Vedder/Chilliwack Technical Committee, and that's  
30 my experience with flood risk management.

31 Q But you don't have any personal experience you  
32 brought to bear in those contexts; is that  
33 correct?

34 DR. ROSENAU: No, I do have personal experience because  
35 I saw on those committees, dealing with flood  
36 engineers, managing hydraulic modelling and I've  
37 also, in effect, provided my opinion on those  
38 issues. I'm not a flood engineer so that's the  
39 distinction.

40 Q Okay. So you're not a flood engineer. Thank you.  
41 And do you have any particular expertise in public  
42 safety issues generally, from a policy or  
43 operational level, from your experience?

44 DR. ROSENAU: Maybe you can describe that a little bit  
45 more clearly.

46 Q I'm wondering if you've ever brought personal  
47 experience or training to bear in the planning for

1 public safety as it pertains to flood risk?

2 DR. ROSENAU: Well, I was the B.C. Hydro representative  
3 from a fish perspective in Victoria. I had a  
4 secondment in Victoria, and we dealt with flood  
5 issues, in particular, the 1997 flood -- province-  
6 wide flood issue. And so that had those flood  
7 risk components to it, but I'm not trained as a  
8 flood risk engineer or manager.

9 MR. SPIEGELMAN: Thank you.

10 MS. SCHABUS: Mr. Commissioner, Nicole Schabus for the  
11 record. I'm co-counsel for the Sto:lo Tribal  
12 Council and the Cheam Indian Band. I also have  
13 some follow-up questions, if I may?  
14

15 CROSS-EXAMINATION ON QUALIFICATIONS BY MS. SCHABUS:

16  
17 Q Dr. Rosenau, looking at your c.v., you list one of  
18 the cases that you were qualified in as **R. v.**  
19 **Douglas**.

20 DR. ROSENAU: That's correct. I was one of the agency  
21 expert witnesses on that case.

22 Q And your qualifications were limited to being a  
23 habitat biologist in that case, right?

24 DR. ROSENAU: It could be, if that's what the document  
25 said.

26 Q Record shows? And you specifically admitted in  
27 that case that you're not qualified to speak to  
28 fluvial geomorphology, correct?

29 DR. ROSENAU: I might have at that time.

30 Q And you would also recall that actually, one of  
31 the points that the case came down to is the issue  
32 of whether gravel removal impacted or constituted  
33 destruction of fish habitat, right?

34 DR. ROSENAU: I believe that's correct, but you would  
35 have to point the line out to me.

36 Q Sure, I could point the line out to you, but you  
37 would be aware that your qualifications came in  
38 question in that case by Judge Lenaghan?

39 DR. ROSENAU: Well, I'd have to see the statement with  
40 regards to what he brought into question.

41 Q Okay.

42 MS. SCHABUS: I'm going to ask to pull up the document  
43 from the Province's list of documents, under Tab  
44 23, please. Sorry, Your Honour, I'm trying to  
45 find it in my paper copy -- Mr. Commissioner.

46 Q I'm going to first take you to paragraph 143, if I  
47 may, Tab 23. Yeah, perfect. That would be on --

1 I have a different version of the document. Just  
2 paragraph 143.

3 Q Just taking you to that paragraph first, you  
4 agreed that you're not a fluvial geomorphologist  
5 or could not assess the stability of the armouring  
6 layer on top of the gravel lift that he had seen  
7 in January 1998. You recall making that statement  
8 and being questioned in that regard?

9 DR. ROSENAU: I'll accept it as written.

10 Q And actually, you would not be qualified to  
11 conduct geomorphological studies about channel  
12 stability or generally, your qualifications and  
13 accreditation does not qualify you to conduct  
14 geomorphological studies, correct?

15 DR. ROSENAU: I'm not a fluvial geomorphologist, but I  
16 deal with fluvial geomorphological issues as part  
17 of my habitat dealings so I have a level of  
18 experience that allows me, I think, as a  
19 professional. Not a registered professional  
20 fluvial geomorphologist, but as somebody who's  
21 dealt with the topic. And again, the court case  
22 was about 10 years ago so there's been an  
23 additional 10 years of experience so I do view  
24 myself as being able to make some comments.

25 Q But the court case was exactly about that issue,  
26 connecting the habitat aspect to the gravel  
27 removal and whether it did constitute a  
28 destruction of fish habitat, right, and that's in  
29 regard to what you were called, correct?

30 DR. ROSENAU: In a general sense, yes.

31 Q Okay. So I'm going to just take you briefly to  
32 paragraph 204. And you've reviewed this decision  
33 since it came down? You listed it in your CV,  
34 right, the case?

35 MS. SCHABUS: Paragraph 204, please?

36 Q And this is Judge Lenaghan's ruling:

37  
38 I was unable to give any significant weight  
39 to the opinions the three experts offered on  
40 issues which they admitted were beyond their  
41 expertise. As a result, the evidence on  
42 these important issues fell far below the  
43 required standard of proof. It is somewhat  
44 puzzling that the Crown did not call a  
45 fluvial geomorphologist or river engineer to  
46 testify when it must have known ...  
47

1 That that would be required. And it refers to  
2 other fluvial geomorphologists. And it states in  
3 paragraph 205, then:  
4

5 As mentioned earlier, the experts were unable  
6 to provide any meaningful, direct evidence  
7 with regard to the effects of the gravel-  
8 extraction fish-habitat they described and  
9 discussed. Each relied ...

10  
11 On other secondary evidence so to say. And so  
12 basically, you would agree with me that in this  
13 case, the conclusion was, one, that there wasn't  
14 sufficient expert evidence and qualifications  
15 rendered to --

16 MS. BAKER: I don't think it's appropriate to ask the  
17 witness to agree with what an opinion of a court  
18 is. The opinion is what it is.

19 MS. SCHABUS: That is fine.

20 Q But clearly, that connection was not established  
21 in that court case, you'd agree with that?

22 DR. ROSENAU: No, I would agree that the judge had his  
23 opinion and other people had their opinions, and I  
24 would also add that a lot of -- I'll put it this  
25 way, a lot of water's gone under the Rosedale-  
26 Agassiz Bridge in the interim, where people like  
27 Laura and myself have spent a lot of time learning  
28 things and so I think we understand the river much  
29 better.

30 Q You understand and you can read studies that  
31 fluvial geomorphologists have written, but you are  
32 not the one who is qualified to actually  
33 specifically conduct those studies or provide  
34 primary evidence on those as a fluvial  
35 geomorphologist, correct?

36 DR. ROSENAU: If I have to put a stamp under the  
37 Association of Professional Engineers and Fluvial  
38 Geomorphologists, no, I can't do that, but I can  
39 certainly make statements of my opinion given the  
40 extent of experience I've had in the interim.

41 Q In the field of habitat and drawing conclusions,  
42 but not a fluvial geomorphologist, you'd agree  
43 with that?

44 DR. ROSENAU: The two are joined at the hip.

45 Q Where you rely on others to conduct the studies,  
46 but you're not the one qualified to conduct them,  
47 and you do not conduct them? You haven't

1           conducted them in the context of the Lower Fraser  
2           River, have you?

3   DR. ROSENAU: Not in a global sense, but I do interact  
4           with them on a regular basis.

5   Q    You interact with them, but you don't conduct  
6           those studies?

7   DR. ROSENAU: That's correct.

8   MS. SCHABUS: Thank you, those are my questions.

9   MS. BAKER: Oh, could my friend clarify, is she only  
10           attacking the expertise of Dr. Rosenau in this?

11   MS. SCHABUS: Specifically, yes, I've seen Dr. Rempel's  
12           Ph.D. so I think she's able to comment in the  
13           context of what she did in her Ph.D., but  
14           regarding Dr. Rosenau, I would oppose the  
15           qualification on the second point.

16   MS. BAKER: All right. And I take it Federal Crown is  
17           of the same position?

18   MR. SPIEGELMAN: Canada's position is that neither of  
19           these witnesses are qualified to give opinion  
20           evidence on the issue of flood risk impact and the  
21           engineering aspects of the topic today.

22   MS. BAKER: All right. To be clear, Mr. Commissioner,  
23           I'm not asking either of these witnesses to be  
24           qualified as experts -- oh, I'm sorry, I didn't  
25           realize I had a third objector, but I do.

26   MR. TYZUK: Boris Tyzuk for the Province of British  
27           Columbia. The Province concurs with the views of  
28           Canada on this matter.

29   MS. BAKER: To be clear, Mr. Commissioner, I'm not  
30           asking for either witness to be qualified as  
31           experts in flood risk or however my friend for  
32           Canada described it. What I'm asking them to be  
33           qualified as is experts in freshwater fish habitat  
34           and flowing waters and rivers, with an emphasis in  
35           the Lower Fraser. I haven't heard anybody dispute  
36           that. And fluvial geomorphology and hydrology as  
37           those relate to freshwater aquatic ecosystems and  
38           flood profiles. And what I'm asking these people  
39           to do today is to assist you in understanding how  
40           changes in the river system and how changes in  
41           gravel beds affect habitat for fish, in  
42           particular, sockeye salmon. That's why I've  
43           called these witnesses.

44   THE COMMISSIONER: Can you just say the second part  
45           slowly?

46   MS. BAKER: Sure. Fluvial geomorphology and hydrology  
47           as those relate to freshwater aquatic ecosystems

1 and flood profiles. So the issue that I'm asking  
2 these witnesses to testify on, and to assist the  
3 court, is how the flowing rivers affect fish  
4 habitat, how changes to the morphology of the  
5 river will affect fish habitat, particularly  
6 sockeye habitat. That's why I'm asking these  
7 witnesses to come and assist the court with their  
8 expertise in that area. And the case of **Douglas**,  
9 which Ms. Schabus took the witness to, in fact, in  
10 that case, Dr. Rosenau was qualified, at paragraph  
11 97 of that decision, he was qualified as an expert  
12 in river fish biology, with an emphasis on  
13 physical habitat, including sediment and its  
14 removal, and with regard to the life histories of  
15 salmonoids and sturgeon and their habitats. So  
16 while there were comments made later in the  
17 judgment about areas that he'd entered into  
18 outside of his expertise, the court did qualify  
19 Dr. Rosenau within that exact area of expertise  
20 which is, in my submission, another way of saying  
21 what I've asked him to be qualified here today as.  
22 And a number of the papers which have been  
23 described by Dr. Rosenau were written post. And  
24 in terms of Ms. Schabus' submission that Dr.  
25 Rempel is qualified in this area, but Dr. Rosenau  
26 is not, I note that Dr. Rosenau supervised Dr.  
27 Rempel's thesis on this front so it would be odd  
28 that the student is more qualified than the  
29 teacher.

30 THE COMMISSIONER: Yes, I -- I can't get the microphone  
31 any closer. Okay. Thank you very much. I was  
32 not aware of this objection to the qualifications  
33 of these two witnesses to testify in the areas in  
34 which Ms. Baker has outlined, so I haven't really  
35 enough background at this stage. You've made very  
36 brief submissions on areas that are very  
37 technical.

38 My suggestion is this: this is not a trial,  
39 we know. But my suggestion, if counsel will agree  
40 to it, is this: that we conduct a kind of *voir*  
41 *dire* around this evidence. I will allow Ms. Baker  
42 to examine the witnesses as she prepared to  
43 examine them, in the areas that she has prepared  
44 to examine them in. You will all have an  
45 opportunity to cross-examine these witnesses once  
46 their evidence is completed by Ms. Baker, and when  
47 you make your final submissions, I will receive

1 your submissions on, really, two matters, one,  
2 whether some parts of their evidence ought to be  
3 admitted as part of the Commission process in  
4 terms of the body of evidence, or alternatively,  
5 the question of how much weight I ought to attach  
6 to a piece of evidence from either one of them  
7 given during the course of their testimony. And  
8 ultimately, I will deal with that when I issue my  
9 report in terms of what weight or whether I, in  
10 fact, treat their evidence as part of the body of  
11 evidence whatsoever.

12 If we don't deal with it that way today, I  
13 would simply want to reserve on these objections  
14 because I don't have enough, at the moment,  
15 background in these areas which are very technical  
16 to be able to give a ruling based simply upon a  
17 couple of paragraphs from a court decision and  
18 your very brief submissions today.

19 So that would be my suggestion, if it's  
20 comfortable for counsel to conduct it that way,  
21 I'm content to do it that way.

22 MS. BAKER: I support that. I think my friends will  
23 find that the witnesses are not going to move out  
24 of the areas that I've described for them.

25 MR. SPIEGELMAN: I'm quite content with that proposal.  
26 Thank you.

27 MS. SCHABUS: So am I, Mr. Commissioner. Sorry.

28 MR. TYZUK: As are we, Mr. Commissioner.

29 THE COMMISSIONER: Thank you, counsel, very much. As I  
30 say, I don't plan to qualify them today, I reserve  
31 on that, but I will have an opportunity later to  
32 receive your submissions about the body of their  
33 evidence and how I ought to deal with it. Thank  
34 you.

35 MS. BAKER: Thank you.

36  
37 EXAMINATION IN CHIEF BY MS. BAKER:  
38

39 Q I'll start with you, Dr. Rempel. If you could jus  
40 provide us with a bit of background, and I'll ask  
41 you to lay a lot of the foundation for the  
42 evidence that we're going to hear today and  
43 tomorrow. First of all, if we could go to Tab 3  
44 of the Commission's documents, you'll see the  
45 article, 2009 article of Rempel and Church. This  
46 is the one I referred to when I reviewed your CV,  
47 is that right?



1 DR. REMPEL: That's correct.

2 Q And on Ringtail page 3, which is 54 out of the  
3 journal, there's a nice map that shows us the  
4 area, the study area, but that, I think, will be  
5 helpful for the Commissioner when you answer this  
6 question I'm going to pose, which is can you  
7 identify the area known as the gravel reach on the  
8 Fraser River?

9 DR. REMPEL: Yeah, Commissioner, referring to the  
10 figure here, the gravel reach generally refers to  
11 a stretch of the Fraser River that's,  
12 approximately, 60 kilometres in length. It's  
13 bounded at the upstream end by the town of Hope  
14 and at the downstream end by the town of Mission,  
15 and it represents a stretch of the Fraser River  
16 that is predominantly an accumulation zone of  
17 gravel-sized sediment, and it's referred to as the  
18 gravel reach because it's gravel-sized sediment  
19 that makes up the bed of the river. And at the  
20 town of Mission, the gradient slackens to such a  
21 degree that the river no longer has the power to  
22 move gravel-sized sediment so it transitions to a  
23 sand bed reach, and that's why from Mission  
24 downstream, it's referred to as the sand reach.

25 Q Okay. Thank you. And in your thesis, which we've  
26 included at Tab 2 --

27 MS. BAKER: Oh, sorry, I'll first mark that exhibit,  
28 please, as the next exhibit, the article.

29 THE REGISTRAR: Exhibit 1070.

30 THE COMMISSIONER: Which tab is that, Ms. Baker?

31 MS. BAKER: Three.

32 THE COMMISSIONER: I have a screening report. Maybe I  
33 have the wrong binder.

34

35 EXHIBIT 1070: Rempel & Church, "Physical and  
36 Ecological Response to Disturbance by Gravel  
37 Mining in a Large Alluvial River," 2009  
38

39 MS. BAKER: Is that the Commission's, or B.C.'s?

40 THE COMMISSIONER: It says, "Gravel Removal B.C.  
41 documents"

42 MS. BAKER: Yeah, okay, that's B.C.'s.

43 THE COMMISSIONER: Oh, all right, then I've got the  
44 wrong one. I'm sorry. My apologies.

45 THE REGISTRAR: Okay. Here we are.

46 THE COMMISSIONER: My apologies. Thank you very much.  
47 It's my fault.

1 MS. BAKER: There's a lot of big binders for this one.  
2 I'm sorry. You're going to have strong wrists by  
3 the end of tomorrow.

4 THE COMMISSIONER: Sorry.

5 MS. BAKER: Okay. So Tab 3 is the article that Dr.  
6 Rempel wrote with Dr. Church, and we were looking  
7 at page 54 in the journal, but it's 3 in the  
8 Ringtail numbers. And then I was going to ask Dr.  
9 Rempel to her Ph.D. thesis because there's a  
10 useful diagram in that, as well, and we've just  
11 got excerpts, I think, in the binder, but Ringtail  
12 page number 100 should pull up a figure. Right.

13 Q Okay. First of all, just to identify, this is a  
14 copy of your thesis?

15 DR. REMPEL: That's correct.

16 MS. BAKER: I'll first mark the thesis as an exhibit  
17 and then we'll go to the figure.

18 THE REGISTRAR: Exhibit 1071.

19

20 EXHIBIT 1071: Rempel Thesis: Physical and  
21 Ecological Organization in a Large, Gravel-  
22 Bed River and Response to Disturbance, July  
23 2004  
24

25

MS. BAKER: All right.

26 Q Now, could you use this diagram and just explain  
27 to us how sockeye salmon may use aspects of the  
28 reach, as you've -- I think this is just a make  
29 believe bar that shows all the different features  
30 you might see on a bar; is that right?

31 DR. REMPEL: That's correct. Yeah, this illustration  
32 in my thesis is meant to be a simple caricature of  
33 gravel bars that are commonly occurring along the  
34 gravel bed reach. Gravel bars are sedimentation  
35 zones, or locations where gravel accumulates in  
36 large quantity and the schematic is meant to  
37 depict the range of habitat types that you would  
38 typically see around the perimeter of a gravel  
39 bar. So it gives a sense of the variety and the  
40 complexity of these gravel bars and each of these  
41 habitat types have a particular depth, and  
42 velocity and substrate characterization, and that  
43 makes them more or less suitable and favourable  
44 for different fish species. And the channels that  
45 are depicted bounding the gravel bar, the main  
46 channel and side channel, as well as a summer  
47 channel intersecting diagonally across the bar are

1           meant to represent the different flow paths that  
2           sort of divert around these sedimentation gravel  
3           bar zones.

4           Q     All right. So which of these areas would be used  
5           by sockeye salmon?

6           DR. REMPEL: Based on the extensive sampling that I did  
7           over three years for my Ph.D. research, as well as  
8           based on the sampling that others have done in the  
9           gravel bed reach, we found juvenile sockeye salmon  
10          consistently locating only in slack water habitats  
11          which on this figure, we referred to as channel  
12          nooks and bays. And this is consistent with the  
13          literature, where juvenile sockeye are found in  
14          other river systems, as well.

15          Adult sockeye salmon moving upriver in  
16          migration don't tend to be associated with any  
17          particular habitat features as they're making an  
18          upriver migration so they're just following sort  
19          of energetically-favourable flow paths upriver.

20          Q     And are you aware of any sockeye that's spawned on  
21          the gravel reach?

22          DR. REMPEL: I'm not aware of any sockeye salmon that  
23          spawn in the mainstem gravel reach, but I am aware  
24          of a population that has been observed spawning in  
25          a slough habitat towards the top end of the gravel  
26          reach. The slough is referred to as Mariah  
27          Slough, and this population has been observed in  
28          at least four different years over the past three  
29          decades so the observations indicate it's a  
30          sporadically-occurring population of very small  
31          numbers. These numbers have been as small as two  
32          adult sockeye in some years, such as 2006, but as  
33          large as up to 100 adult sockeye in 1986. But the  
34          observations suggest that it's a sporadically-  
35          occurring population.

36          Q     All right. And you just identified that you spent  
37          three years doing surveys of fish in the gravel  
38          reach as part of your thesis?

39          DR. REMPEL: That's right, between the years of 1999  
40          and 2001.

41          Q     All right. And as part of your thesis, was within  
42          the scope of that work to determine what species,  
43          aquatic species are using the gravel reach?

44          DR. REMPEL: Yeah, that's exactly right.

45          Q     All right. If I could ask you to turn to your  
46          thesis, Table 3-4, which is at page 53. Let me  
47          find the Ringtail number for that. So that would

1 be Ringtail number 77.

2 Q All right. What does this table show? First of  
3 all, just to identify that sockeye is noted here,  
4 sockeye salmon, *O. nerka*, on the second to the  
5 last line under "salmonoids." What is this table  
6 illustrating or describing?

7 DR. REMPEL: This table is a summary of my catch data  
8 using a beach seine net, based on 960 beach seine  
9 samples, and it reflects the occurrence of the  
10 species in the gravel reach, the occurrence of  
11 those species in my beach seine sample. So out of  
12 a total of 960 beach seines that were carried out  
13 over three years, sockeye salmon occurred in 11.7  
14 percent of those. And that corresponds to, I  
15 believe, around 105 of the 960 samples. So at  
16 least one or more juvenile sockeye salmon were  
17 found in 105 of the 960 samples.

18 Q All right. And then Table 6.1, which is Ringtail  
19 number 199, what does this table show?

20 DR. REMPEL: This table is based on the exact same data  
21 set of 960 beach seine samples, and it reflects  
22 the total number of fish caught in those beach  
23 seines, a total of 40,000, and it demonstrates  
24 that on average, sockeye salmon represented .8  
25 percent of my total catch so that was 201 juvenile  
26 sockeye out of a total of 40,974 fish. So these  
27 fish were caught over multiple seasons and over  
28 three years.

29 Q Thank you. I'd also like to take you to the PPR  
30 and ask you to assist me in making a correction at  
31 page 6 of that document. So at the top of the  
32 page, which is in paragraph 8, you'll see it's  
33 describing the fish, and then a gravel reach. It  
34 says, and this is the beginning of the sentence on  
35 the previous page:

36  
37 Sockeye salmon are not known to spawn in the  
38 gravel reach, unlike pink --

39  
40 And it says:

41  
42 -- coho salmon.

43  
44 And I don't think "coho" is right. Should it be a  
45 different?

46 DR. REMPEL: That's correct. That should say "chum."

47 Q Or Chinook, or just chum?

1 DR. REMPEL: Pink and chum are known to spawn in the  
2 gravel reach. That sentence should be corrected  
3 to "chum."

4 Q Okay. Thank you. Without taking you to it, in  
5 your Ph.D. thesis, you refer to the sockeye salmon  
6 that you found in your study as accidentals. What  
7 did you mean by that and is it still your view  
8 that they're accidentals?

9 DR. REMPEL: At the time of conducting my research, I  
10 was aware of river-type sockeye occurring in the  
11 Pitt River, and I make mention of that in my  
12 thesis, and these 201 sockeye that I had caught  
13 over those three years was puzzling to myself and  
14 to my committee members, including Dr. Rosenau.  
15 And at the time, the body of knowledge we had on  
16 these river-type sockeye, really, we discounted  
17 the possibility that these sockeye might be these  
18 river-type juveniles and instead, we referred to  
19 them as accidentals, indicating that we expected  
20 they were likely strays from a lake-type  
21 population that had either inadvertently or  
22 deliberately moved out of the lake environment to  
23 rear in the gravel bed reach. And the fact that  
24 we found them in such low numbers sort of, I  
25 guess, substantiated that view.

26 Now, with more information available on this  
27 river-type juvenile sockeye that we know of, I  
28 would perhaps refer to them as incidentals, but  
29 there's no way to be absolutely sure that they  
30 would be either a lake type or a river-type  
31 sockeye without genetic analysis. There's a  
32 likelihood that it might have been a mix.

33 Q Okay. Are you aware of any other studies or  
34 surveys, or work done, published or unpublished,  
35 that would help understand the number of sockeye  
36 salmon using the gravel reach?

37 DR. REMPEL: In addition to the work that I've carried  
38 out, there have been extensive stock assessment  
39 surveys done over many decades, over the fall  
40 month periods during spawning, that have looked  
41 for all species of Pacific salmon, including  
42 sockeye, and some of those observations I've  
43 referred to earlier.

44 There has been some work recently done by Dr.  
45 Rosenau that he might speak to later, and some of  
46 his students. That more or less sums up the body  
47 of work I know of on sockeye.

1 Q All right. I'd like to move to Dr. Rosenau. You  
2 have done some sampling work in the Fraser River,  
3 and I think going back to 2007, you did some  
4 sampling work in the Fraser River, which data was  
5 provided to Canada; is that right?

6 DR. ROSENAU: I think you're referring to the BCIT  
7 studies; is that correct?

8 Q Well, I'm actually looking at --

9 DR. ROSENAU: Oh, the *ad hoc* gravel committee work.

10 Q Right. There was a --

11 DR. ROSENAU: Yes.

12 Q If you look in Canada's binder of documents,  
13 there's an email at Tab 3 and some data following,  
14 in Tab 4. So this is an email from you to Barbara  
15 Mueller, and it attaches the sampling results or I  
16 don't know how to describe it, but the work that's  
17 at Tab 4 --

18 DR. ROSENAU: Yeah.

19 Q -- which is, I think, taken from the sampling work  
20 you did in the river?

21 DR. ROSENAU: Yes, basically, it was a single-day  
22 survey that I conducted, or a bunch of us  
23 conducted through the auspices of the Fraser River  
24 Gravel Stewardship Committee, and we got  
25 permission through a sampling permit to be able to  
26 look at and sample some of the sites that we  
27 thought were of importance in the gravel reach  
28 upstream, from Tramner Bar upstream.

29 MS. BAKER: And if you could, Mr. Lunn, turn to Tab 4  
30 and go to the very end of that document, the last  
31 two pages.

32 Q And maybe just before you get there, Dr. Rosenau,  
33 you can just explain what you found when you did  
34 that work.

35 DR. ROSENAU: Well, we found, I think it was about  
36 eight or 10 species, different species of fish  
37 inhabiting a variety of different habitat types,  
38 some of those habitat types of which Laura has  
39 mentioned already. Most ubiquitous and probably  
40 the highest density or highest numbers were  
41 chinook salmon, juvenile chinook salmon, which is  
42 understandable. Juvenile chinook salmon utilized  
43 the gravel reach very extensively. We also found  
44 some non-salmonoid species, *Cyprinids*, which are  
45 normally known as or often known commonly as  
46 minnows, and *Catostomids*, which are suckers. We  
47 also found a number of salmonoids that were not

1 chinook, including, I think, maybe a cutthroat  
2 trout or two, some whitefish, and we also juvenile  
3 sockeye salmon.

4 Now, those sockeye salmon -- I just want to  
5 make a bit of a distinction, which Laura didn't  
6 make, but I think she can appreciate what I'm  
7 saying here, when you refer to juveniles, you can  
8 refer to animals that have lived a year in  
9 freshwater in lakes, and when they smolt or go out  
10 to sea, that's one life history phase. The fish  
11 that we're talking about, the life history of  
12 sockeye salmon that we're predominantly talking  
13 about today as juveniles are younger than a year  
14 or fish that have not spent a full year in  
15 freshwater or have just passed that full year, if  
16 you catch them January. And so those are the  
17 juveniles that we caught at Tramner Bar, and we  
18 caught them in what I refer to as a nook.

19 Q Okay. The page that's on the screen now, which is  
20 Ringtail 19, what does that describe?

21 DR. ROSENAU: Basically, what it basically says is of  
22 the 10 habitats or 10 locations that we sampled,  
23 the two locations that we found juvenile, the  
24 younger than a year sockeye or upper spring bar  
25 and Tramner, and at Tramner, which was kind of a  
26 very discrete habitat relative to the other  
27 habitats that we looked at so in other words, it  
28 was one of these channel nooks that Laura  
29 describes, I think we caught something like 13  
30 sockeye in the mix, in addition to a large number  
31 of juvenile chinook.

32 Q Okay. And then the following page, does this tell  
33 us anything different from what you just  
34 described?

35 DR. ROSENAU: It's just a continuation of what I  
36 described. We found very large numbers of chinook  
37 in particular habitats. The bar directly across  
38 from Tramner Nook had a look of chinook. There  
39 were chinook upstream. But again, Tramner Nook  
40 was the one location, the one habitat feature, and  
41 it's consistent with Laura's thesis, where she  
42 found most of the juvenile, the younger than a  
43 year sockeye in nooks as opposed to the spectrum  
44 of the other eight or 10, or 12 habitat types that  
45 she found. And the Tramner Nook was kind of  
46 unique insofar as it appeared to be groundwater  
47 fed, that is water percolating from out of the

1 ground. It wasn't a stillwater environment. And  
2 one of the hints that it might have been  
3 groundwater is that it was very intensely covered  
4 with algae, as opposed to a lot of the other  
5 habitats that we looked at. So the water  
6 chemistry, or the water temperatures, or whatever,  
7 was different about Tramner. These sockeye were  
8 very clearly, in my view, in my opinion, attracted  
9 to that site.

10 Q And then did you go back to the Tramner site in  
11 2010?

12 DR. ROSENAU: Yes, we did, we went. Sort of the same  
13 group of people, or similar group of people under  
14 the auspices of the Fraser River Gravel  
15 Stewardship Committee went out on a day,  
16 December 17th. DFO was gracious in providing us  
17 with a permit to do this. And we didn't have a  
18 lot of time that day, but one of the things that I  
19 wanted to do was go back to Tramner and basically  
20 say, "Okay, this is my hypothesis. If that  
21 particular habitat type is special to sockeye,  
22 will we find them again?" We went back to the  
23 Tramner Nook, it was there in one form or another,  
24 similar to what it was in 2007. And, essentially,  
25 the first seine that we did, we caught sockeye  
26 again so there's something consistent going on  
27 there.

28 Q And did you prepare a document to set out the  
29 observations and photographs of the work that you  
30 did that day in December 2010?

31 DR. ROSENAU: That's right. A colleague of mine, Otto  
32 Langer, was the first person to provide a  
33 document, and I basically abstracted his key  
34 points, put the words in my own way, wrote them  
35 down on paper, and that document was submitted to  
36 you.

37 Q All right.

38 MS. BAKER: And that's at Tab 28 of the Commission  
39 documents. If I could have that marked, please,  
40 as the next exhibit?

41 THE REGISTRAR: Ms. Baker, did you want Tabs 3 and 4  
42 marked?

43 MS. BAKER: I did, thank you.

44 THE REGISTRAR: Tab 3 will be marked as 1072, Tab 4  
45 will be marked as 1073, and now you wish, on your  
46 list, Tab 28 --

47 MS. BAKER: Yes.



97  
PANEL NO. 46  
In chief by Ms. Baker

1 THE REGISTRAR: -- to be marked, which will be 1074; is  
2 that correct?

3 MS. BAKER: Yeah. No, that's correct. Thank you.

4 THE REGISTRAR: Thank you.

5

6 EXHIBIT 1072: Email from M. Rosenau (BCIT)  
7 to B. Mueller et al, re Fish Collection  
8 Permit, Dec 13 2010

9

10 EXHIBIT 1073: Attachment to Exhibit 1072 -  
11 Basok et al, Fraser River Seine Sampling,  
12 Nov 7 2007, [FR Gravel Stewardship Committee]

13

14 EXHIBIT 1074: Rosenau, Lower Fraser Gravel  
15 Reach Assessment of Past and Proposed Gravel  
16 Bar Mining Locations, Dec 10 2010 [FRGSC]

17

18 THE COMMISSIONER: Ms. Baker, I note the time.

19 MS. BAKER: Thank you.

20 THE COMMISSIONER: John, could you just bring up Tab 3,  
21 or it would be, now, 1072. I'm sorry. Is that  
22 the only thing at that tab?

23 MR. LUNN: The email is Tab 3.

24 THE COMMISSIONER: All right. Just so you know, maybe  
25 it's just me today, Ms. Baker, but I think I do  
26 have Commission counsel's binder, but my Tab 3,  
27 there's a --

28 MS. BAKER: No, I went too fast. I apologize. It's in  
29 Canada's binder, the very small binder.

30 THE REGISTRAR: Microphone, please.

31 THE COMMISSIONER: Your mike's not on.

32 MS. BAKER: Excuse me. Canada's binder, a very small  
33 binder --

34 THE COMMISSIONER: Oh.

35 MS. BAKER: -- was where the Tabs 3 and 4, the 2007  
36 sampling was found. Yeah, so you've probably got  
37 it there in your hand.

38 THE COMMISSIONER: Okay. So --

39 MS. BAKER: You should have an email at Tab 3, and then  
40 those data at Tab 4.

41 THE COMMISSIONER: Yes, I think, just for the record,  
42 so you've been saying Tab 3 of Commission counsel  
43 and, I'm sorry --

44 MS. BAKER: I did talk about Tab 3 of Commission  
45 counsel initially, that was the Rempel and Church  
46 article.

47 THE COMMISSIONER: Yes, correct.

June 15, 2011

1 MS. BAKER: And I may have gotten mixed up here and  
2 said --  
3 THE COMMISSIONER: Oh, I see. Okay.  
4 MS. BAKER: Potentially, I got that mixed up.  
5 THE COMMISSIONER: I think that's what happened. I was  
6 still --  
7 MS. BAKER: Sorry.  
8 THE COMMISSIONER: I was still on the Commission's  
9 binder. All right. That clarifies it for me.  
10 Thank you very much. Sorry about that. Okay.  
11 Thank you.  
12 THE REGISTRAR: The hearing is now adjourned for the  
13 day and we'll resume at ten o'clock tomorrow  
14 morning.

15  
16 (PROCEEDINGS ADJOURNED TO THURSDAY, JUNE 16,  
17 2011, AT 10:00 A.M.)  
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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.

---

Pat Neumann

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.

---

Diane Rochfort

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.

---

Irene Lim