

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

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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PANEL NO. 45
In chief by Mr. McGowan

Vancouver, B.C./Vancouver
(C.-B.)
June 15, 2011/le 15 juin 2011

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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

June 15, 2011

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

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

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

18

19 MR. ARNOTT: Yes.

20

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

23

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

29

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

33

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

36

37 Q It is Canada who is vested with the responsibility
38 and the jurisdiction to protect fisheries
39 resources, correct?

40

41 MR. ARNOTT: Correct.

42

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

45

46 MR. ARNOTT: Correct.

47

48 Q In the crafting of the regulations, Canada could,
49 if it saw fit, prescribe higher levels of
50 treatment requirements for particularly sensitive
51 or important receiving environments, could it not?

52

53 MR. ARNOTT: It could.

54

55 Q We had some scientists here yesterday, a couple of
56 whom gave evidence about the benefits of higher,
57 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