COMMISSION OF INQUIRY INTO THE DECLINE OF SOCKEYE SALMON IN THE FRASER RIVER

In the matter of Her Excellency the Governor General in Council, on the recommendation of the Prime Minister, directing that a Commission do issue under Part I of the *Inquiries Act* and under the Great Seal of Canada appointing the Honourable Bruce Cohen as Commissioner to conduct an inquiry into the decline of sockeye salmon in the Fraser River

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FINAL SUBMISSIONS OF THE FIRST NATIONS COALITION ON ISA VIRUS

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I. OVERVIEW

1. These are the final submissions of the First Nations Coalition ("FNC") in relation to the hearings held on December 15, 16 and 19, 2011 on the subject of tests for infectious salmon anaemia ("ISA") virus and subsequent actions by the Department of Fisheries and Oceans ("DFO") and the Canadian Food Inspection Agency ("CFIA") in relation to such test results. These hearings were announced on November 4, 2011, after participants had filed written final and reply submissions, and were convened to "put new information about recent testing for the ISA virus in BC on the Commission's record."[1]

2. These submissions and the recommendations made herein should be read in conjunction with the final written submissions of the FNC provided to the Commission on October 17, 2011, the reply submissions of the FNC provided to the Commission on November 3, 2011, and the oral submissions made on November 10, 2011.

3. These submissions address four main issues:

   a. The tests for ISA virus that were conducted in the fall of 2011 by Dr. Fred Kibenge at the Atlantic Veterinary College ("AVC Lab"), by Dr. Are Nylund at the Fish Disease Group Laboratory at the University of Bergen ("Norway Lab"), Nellie Gagné at DFO's Gulf Fishery Centre ("Moncton Lab"), and Dr. Kristi Miller at DFO's Pacific Biological Station ("Nanaimo Lab");

   b. The tests for ISA virus that were conducted in BC from 2003 to 2004 by then post-doctoral student Molly Kibenge;

   c. The responses of DFO and CFIA to the test results, including: assessments of the AVC Lab and the Moncton Lab; communications with government employees, foreign governments, industry, media, First Nations, stakeholders, and the public; and development of a draft surveillance plan; and,

[1] Cohen Commission Issues Statement About Dealing With New Virus Reports, November 4, 2011 [http://www.cohencommission.ca/en/NewsReleases/DealingWithNewVirusReports.php]; Cohen Commission to hold three days of hearings on ISAv testing December 15, 16 and 19, Media Alert, December 2, 2011 [http://www.cohencommission.ca/en/NewsReleases/HoldThreeDaysOfHearingsOnISAv.php]

d. Recommendations for future research and improved communications and decision-making involving First Nations.

II. TESTING FOR ISA VIRUS USING RT-PCR METHOD

4. ISA virus, which is part of the orthomyxoviridae family, is similar to the influenza virus and causes ISA disease.[2] ISA virus causes communicable disease in farmed Atlantic salmon and has also been found in various species of wild fish.[3]

5. Reverse transcription polymerase chain reaction ("RT-PCR") testing is the method used to detect the presence of ISA virus in fish. Ms. Gagné of the Moncton Lab described the RT-PCR testing process as follows:

> PCR is a process of specific amplification of DNA that is on specific detection of a fragment of DNA in the mixture of DNA. RT is for reverse transcription. In this case, we're working with RNA viruses, so we need to start by extracting the RNA from, in this case, a fish tissue. And if the RNA of the virus is present in there, mixed with the RNA of the fish, where we'd try to detect it with the PCR assay.
>
> So the assay requires primers. Primers are short custom-made segments of DNA that will anneal if there's a match with the DNA in your mixture. If the virus is in the mixture with the DNA of the fish, we would get a match, and the PCR process will amplify that segment between the two primers that you have put in your mixture.
>
> The probe is in between those primers. The probe is linked with a reporter of fluorescent molecule. So when the PCR process goes on, if there was a match with the primers first, the PCR process amplifies what's in between those primers, so it creates a sequence, a short fragment of DNA, and the probe will be released, and what the real time RT-PCR acid detects is the fluorescence from a probe.[4]

[2] Transcript, December 15, 2011, pp. 9-10 (Dr. Fred Kibenge)
[3] Transcript, December 15, 2011, p. 10 (Dr. Fred Kibenge)
[4] Transcript, December 15, 2011, pp. 10-11 (Nellie Gagné)

III. TESTS FOR ISA VIRUS CONDUCTED IN FALL 2011

a. Test Results of Dr. Fred Kibenge (AVC Lab)

6. Dr. Fred Kibenge is a professor of virology and chair of the department of pathology and microbiology at the Atlantic Veterinary College at the University of PEI.[5] He is also the head of the AVC Lab, which is the Organization of International Epizootics ("OIE") Reference Laboratory for ISA for the Americas; one of only two such reference laboratories worldwide.[6] Dr. Fred Kibenge was qualified as an expert in viral diseases of fish, in particular ISA virus, and methods for viral detection and identification.[7]

7. On October 4, 2011, the AVC Lab received a shipment of hearts of 48 sockeye smolts originating from Rivers Inlet ("the 48 sockeye") which Dr. Fred Kibenge tested for the presence of ISA virus.[8] Dr. Fred Kibenge's test results revealed that two of the 48 sockeye (numbers 26 and 36) were positive for ISA virus.[9] The AVC Lab subsequently received three more shipments of fish samples to be tested for ISA virus. Dr. Kibenge's test results for the second shipment of samples revealed that three of the samples were positive for ISA virus.[10] The test results for the third and fourth batches of samples that the AVC Lab received were negative for the ISA virus.[11]

8. When questioned whether the positive ISA virus results the AVC Lab obtained could be attributed to contamination or whether they could be false positives, Dr. Fred Kibenge testified as follows:

> ...the way we work in my lab, by the time we put a result, we would have ruled out all possible causes of contamination, or if it's a false positive. **So by the time we put a result, we are confident that [it] is a true positive result.**[12]

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[5] Transcript, December 15, 2011, p. 8 (Dr. Fred Kibenge)
[6] Transcript, December 15, 2011, pp. 8, 74, 75 (Dr. Fred Kibenge)
[7] Transcript, December 15, 2011, p. 9 (Dr. Fred Kibenge)
[8] Transcript, December 15, 2011, p. 12 (Dr. Fred Kibenge); Exhibit 2005 (Content of information to provide from an OIE Reference Laboratory to inform the OIE on positive result of samples on OIE listed diseases)
[9] Transcript, December 15, 2011, pp. 12, 115 (Dr. Fred Kibenge and Dr. Are Nylund); Exhibit 2015 (Nylund Results, November 2, 2011), p. 1; Exhibit 2005 (Content of information to provide from an OIE Reference Laboratory to inform the OIE on positive result of samples on OIE listed diseases)
[10] Transcript, December 15, 2011, p. 13 (Dr. Fred Kibenge)
[11] Transcript, December 15, 2011, p. 13 (Dr. Fred Kibenge)
[12] Transcript, December 15, 2011, p. 13 (Dr. Fred Kibenge)

9. The RT-PCR tests at the AVC Lab were conducted using a TaqMan probe, a LightCycler machine and its associated software.[13]

10. Dr. Fred Kibenge communicated his results to CFIA on October 15, 2011.[14]

b. Test Results of Dr. Are Nylund (Norway Lab)

11. Dr. Nylund was qualified as an expert in viral diseases of fish, in particular ISA virus and methods for viral detection.[15]

12. Dr. Nylund tested gill tissue of the 48 sockeye. Dr. Nylund's test results revealed that one of the 48 sockeye (number 36) was positive for the ISA virus.[16] Dr. Nylund, however, was not able to repeat the test results.[17] Dr. Nylund testified that there were no signs of contamination and that the Norway Lab was specially designed to conduct this type of testing.[18] The RT-PCR tests were conducted using an ABI 7500 machine and its associated software.[19]

13. Dr. Nylund testified that, based on his own results and his understanding of Dr. Fred Kibenge's methodology, he thinks that Dr. Fred Kibenge's results are correct and reliable.[20]

c. Test Results of Nellie Gagné (Moncton Lab)

14. Ms. Gagné is the molecular biology scientist and laboratory supervisor of the molecular biology unit at the Moncton Lab.[21] Ms. Gagné was qualified as an expert in diagnostic methods and validation techniques for viral detection in fish and seafood.[22]

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[13] Transcript, December 14, 2011, p. 43 (Dr. Fred Kibenge); Exhibit 2005 (Content of information to provide from an OIE Reference Laboratory to inform the OIE on positive result of samples on OIE listed diseases)
[14] Transcript, December 19, 2011, pp. 35-37 (Dr. Kim Klotins)
[15] Transcript, December 15, 2011, p. 8 (Dr. Are Nylund)
[16] Transcript, December 15, 2011, pp. 14, 115 (Dr. Are Nylund); Exhibit 2015 (Report, 2nd November 2011, Testing of gill samples from juvenile *Oncorhynchus nerka* (sockeye salmon) collected in Rivers Inlet on the central coast of British Columbia, Canada)
[17] Transcript, December 15, 2011, p. 14 (Dr. Are Nylund); Exhibit 2015 (Report, 2nd November 2011, Testing of gill samples from juvenile *Oncorhynchus nerka* (sockeye salmon) collected in Rivers Inlet on the central coast of British Columbia, Canada)
[18] Transcript, December 15, 2011, p. 15 (Dr. Are Nylund)
[19] Transcript, December 14, 2011, pp. 43-44 (Dr. Are Nylund)
[20] Transcript, December 15, 2011, p. 116 (Dr. Are Nylund)
[21] Transcript, December 15, 2011, p. 9 (Nellie Gagné)
[22] Transcript, December 15, 2011, p. 9 (Nellie Gagné)

15. On October 25, 2011, the Moncton Lab received the 48 sockeye to be tested for the presence of the ISA virus.[23] From November 10 to 14, 2011 the Moncton Lab conducted RT-PCR testing on a small volume of gill tissue from the 48 sockeye.[24] The Moncton Lab found a "weak positive" in sample number 38, but as the result was not reproducible, the Moncton Lab rejected it.[25]

16. The Moncton Lab reported its results as follows:

> None of the 48 fish tested showed positive results for ISAV by qRT-PCR (samples tested in duplicate). Although qRT-PCR assay passed the quality assurance test based on the results obtained from positive and negative controls, the reference gene test results indicated compromising RNA degradation on all samples tested, **hence the inconclusive result**.[26]

17. Ms. Gagné testified that the Moncton Lab "reported them [the results of the ISA virus testing on the 48 sockeye] as inconclusive based on our policy."[27] Anne Veniot, Section Head of Aquatic Animal Health at the Moncton Lab, noted that:

> Absolutely every sample we received showed signs of degradation. If we compare them all, the kidney extracts showed less degradation than the others. Unfortunately, although "less," **it was still much more than what allows conclusive testing**.[28]

18. The RT-PCR tests at the Moncton Lab were conducted using a Stratagene machine and its associated software.[29] Research conducted by Dr. Fred Kibenge and published in *Aquaculture Research & Development* has revealed that several laboratories that have reported false positives were using the Stratagene real time machine with the MXPro software.[30]

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[23] Exhibit 2002 (Laboratory Results, November 17, 2011)
[24] Exhibit 2002 (Laboratory Results, November 17, 2011)
[25] Transcript, December 16, 2011, pp. 21-22 (Nellie Gagné)
[26] Exhibit 2002 (Laboratory Results, November 17, 2011)
[27] Transcript, December 15, 2011, p. 16 (Nellie Gagné)
[28] Exhibit 2039 (Email from Anne Veniot to Stewart Johnson, dated November 18, 2011); see also Transcript, December 16, 2011, p. 16 (Nellie Gagné)
[29] Transcript, December 15, 2011, p. 44 (Nellie Gagné)
[30] Transcript, December 15, 2011, p. 43 (Dr. Fred Kibenge); Transcript, December 16, 2011, p. 38 (Dr. Fred Kibenge); Exhibit 2034 (Infectious Salmon Anaemia Virus (ISAV) Ringtest: Validation of the ISAV Diagnostic Process using Virus-spiked Fish Tissues and ISAV TaqMan® Real-time RT-PCR)

19. The Moncton Lab has not received its international certification, which as Ms. Gagné noted, is an important assurance or indicator of the quality of the tests the laboratory performs.[31]

d. Research of Dr. Kristi Miller (Nanaimo Lab)

20. Dr. Miller researches molecular genetics at the Nanaimo Lab, and has been running tests on BC fish samples for various known viruses in association with her research on a mortality related signature ("MRS").[32] When Dr. Miller heard about initial, potential positive results for ISA virus she went back and re-tested some of the fish she had previously tested for ISA virus, as she realized she had previously been using an assay that focused on segment 6, not segments 7 and 8 of the ISA viral sequence, and hence may not have been detecting all strains of ISA virus.[33] Every time that Dr. Miller ran the tests, she noted positive results for an ISA sequence.[34]

21. Dr. Miller described her testing process and results as follows:

> Well, since we've actually sequenced from a number of individuals that we ran this assay from, and every time we have sequenced from positives we have obtained an ISA sequence. To me it suggests that these primers are not amplifying all -- the primers are amplifying -- or there are nulls in some of the primers. So the ISA 7, P7 primer set amplifies the most positive samples. It seems to -- it probably matches the ISA variant that we are amplifying in our B.C. sockeye salmon better than the other primers and probes. The other primers and probes are mostly from segment 8. A lot of the work that has been done in DFO in the validation and by, I believe, Nylund and Kibenge, [has] centred on segment 8, and we find quite a lot of variability in our ability to pick up positives with segment 8 with various segment 8 primers. But when we do pick them up, they sequence as being ISA.
>
> So I believe that what we have in B.C. is a somewhat divergent strain of ISA that is not universally picked up with all -- with the assays that are presently in use. So, you know, when you develop one of these assays, you usually develop the assay and a lot of them were developed in, I guess, Nylund's lab, and he could speak to this better than I could in terms of their development. But

[31] Transcript, December 15, 2011, pp. 64, 132, 133 (Nellie Gagné)
[32] Transcript, December 15, 2011, p. 20 (Dr. Kristi Miller); for further information on Dr. Miller's research, please see Section V, E, iv (paras. 296-302) of the FNC's final submissions dated October 17, 2011.
[33] Transcript, December 15, 2011, p. 20 (Dr. Kristi Miller); see also Exhibit 2044 (Rivers Inlet Notes, Miller)
[34] Transcript, December 15, 2011, p. 22 (Dr. Kristi Miller); Exhibit 2042 (Prevalence of ISAV identified using 5 distinct TaqMan assays)

> you have a backdrop of knowing all of the strains that you know about, all of the sequences that you know exist and you try to develop an assay that will amplify all known strains. But you can't know things that you don't have a sequence for, and so there is always the possibility that you will develop an assay that doesn't pick other variants that you didn't know about. And I believe that that's what's happening here.[35]

22. Dr. Miller further testified that the virus that she has detected in her work has been present in wild fish in BC since at least 1986.[36]

23. Dr. Nylund expressed some concerns about the methods used by Dr. Miller to detect ISA virus.[37] Dr. Peter Wright, National Manager of the National Aquatic Animal Health Laboratory System ("NAAHLS"),[38] also testified about the need for Dr. Miller's approach or "new technique" to be further investigated and developed to see if it could transition from a research tool to a diagnostic tool.[39]

24. Dr. Fred Kibenge testified that Dr. Miller's research and results "cannot be ignored."[40] He testified that he thought that the virus present in wild fish in BC could be either orthomyxovirus or orthomyxovirus-like.[41]

25. The Nanaimo Lab uses an ABI 7900 machine and a Fluidigm BioMark machine and their associated software.[42]

26. Dr. Miller's current (in-progress) research has also detected a virus in both wild and farmed fish, which is thought to be causing Heart and Skeletal Muscle Inflammation ("HSMI").[43] Dr. Nylund testified that HSMI, which affects the muscles of the fish and may reduce the quality of the fish "gives up to 10 percent losses in detected farms and up to 100 percent morbidity".[44] HSMI has been found in Chile and is a significant disease of concern in fish farms in Norway.

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[35] Transcript, December 15, 2011, p. 22 (Dr. Kristi Miller)
[36] Transcript, December 15, 2011, pp. 78-79 (Dr. Kristi Miller)
[37] Transcript, December 15, 2011, pp. 57-58 (Dr. Are Nylund)
[38] Transcript, December 16, 2011, p. 85 (Dr. Peter Wright)
[39] Transcript, December 16, 2011, p. 110 (Dr. Peter Wright)
[40] Transcript, December 15, 2011, p. 69 (Dr. Fred Kibenge)
[41] Transcript, December 15, 2011, p. 69 (Dr. Fred Kibenge)
[42] Transcript, December 15, 2011, p. 43 (Dr. Kristi Miller)
[43] Transcript, December 15, 2011, p. 113 (Dr. Kristi Miller)
[44] Transcript, December 15, 2011, p. 113 (Dr. Are Nylund)

e. Conclusions to be Drawn from the 2011 Tests and Research

27. The FNC submits that the evidence and expertise of Dr. Fred Kibenge and Dr. Nylund should be preferred over that of Ms. Gagné. Dr. Fred Kibenge and Dr. Nylund are internationally recognized experts in viral diseases and in particular ISA virus. While Ms. Gagné was qualified as an expert in diagnostic methods and validation techniques for viral detection in fish and seafood, she was not qualified in the Inquiry, nor is she recognized internationally, as being an expert on ISA virus.

28. Two of the 48 sockeye that Dr. Fred Kibenge at the AVC Lab tested were positive for the presence of ISA virus. When Dr. Nylund tested gill tissue from the same 48 sockeye, he too found the presence of ISA virus in one of the same samples that had tested positive under Dr. Fred Kibenge's watch. The fact that the results of the Moncton Lab are "inconclusive" for the ISA virus due to degradation of the samples does not negate either Dr. Fred Kibenge or Dr. Nylund's results.

29. In addition, the FNC submits that the historical context elucidated in the research of Dr. Molly Kibenge (described in section IV(a), below), and the recent work of Dr. Miller, underscore the need for more research to be undertaken in order to better understand whether ISA virus, or an ISA-like virus, is affecting wild and farmed fish in BC, and whether such a virus may be contributing to the declining productivity of Fraser River Sockeye Salmon ("FRSS"). That decline is the very subject of this Inquiry.

30. Dr. Fred Kibenge operates an independent laboratory, tested the 48 sockeye first and before they were heavily degraded, and has internationally recognized expertise in the detection of ISA virus. Accordingly, the FNC supports his assessment of the possibility of there being ISA virus in wild salmon in BC, where he testified as follows:

> You know, **in my view, based on the information I've had this morning and from the test results I came with beginning in October, I think there's evidence that there are ISA virus sequences in the fish samples from B.C.** and some of that information actually ties back to the work that Dr. Molly Kibenge was doing here way back in 2002, 2004, where she had that type of information, but the data was not allowed to go forward because it was considered to be -- because of contamination.
>
> So the information we're getting now seems to actually suggest that probably it wasn't contamination and that probably there are some sequences here that can be picked up when you use the ISA virus primers and probes.

> I respect the comment by Dr. Nylund that maybe the sequences may not indicate ISA virus here in B.C., and part of that is simply because probably they are very small sequences, you know, in the case of Dr. Miller's -- the results of (indiscernible) nucleotides. But I think the fact that they were obtained without any positive control and when we have blasted the GenBank, which has most of the published ISA virus sequences, I mean, I think that result is credible.
>
> **Now, whether it's ISA or ISA virus-like, you know, that depends on probably to need some more work. I know that in the virus classification, you know, ISA is put in the family Orthomyxoviridae. There's one genus ISA virus and there's one species, ISA -- infectious salmon anaemia virus. So within that genus, I would expect that there may be ISA virus-like sequences that could be homologous - we've got to get picking up here - so I cannot exclude the fact that the virus that we're detecting here may be within the genus ISA virus. It may be ISA virus sequences or it may be ISA virus-like, but I think the evidence is, to me, it's overwhelming that there's Orthomyxovirus here.**[45]

31. The FNC's recommendations regarding areas of further research are outlined in sections VI and VII below.

IV. RESEARCH ON ISA VIRUS CONDUCTED IN 2003-2004

a. Research of Dr. Molly Kibenge

32. Dr. Molly Kibenge was a post-doctoral student in Dr. Simon Jones' laboratory at DFO's Pacific Biological Station from approximately January 2003 to June 2004.[46] During that time Dr. Molly Kibenge surveyed wild Pacific salmon (including Cultus Lake sockeye salmon) for viruses, including ISA virus. Dr. Molly Kibenge likely worked with First Nations on the ground, including the Soowahlie First Nation, to gather samples from Cultus Lake sockeye salmon.[47]

33. DFO's expectation at the time with regard to Dr. Molly Kibenge's research was, in Dr. Jones' words, "looking for something we didn't believe to be there."[48]

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[45] Transcript, December 15, 2011, pp. 59-60 (Dr. Fred Kibenge)
[46] Transcript, December 16, 2011, p. 126 (Dr. Simon Jones)
[47] Transcript, December 19, 2011, p. 95 (Dr. Simon Jones)
[48] Transcript, December 16, 2011, p. 126 (Dr. Simon Jones)

34. During the course of her work, and through RT-PCR testing of numerous fish samples, Dr. Molly Kibenge began to find positive signals for ISA virus.[49] In particular, of the 64 tissue samples Dr. Molly Kibenge tested from Cultus Lake sockeye salmon, all 64 showed positive results for ISA virus.[50] These findings were outlined in a draft manuscript prepared by Dr. Molly Kibenge under the supervision of Dr. Jones entitled "Asymptomatic infectious salmon anaemia in juvenile *Oncorhynchus* species from the North West Pacific Ocean", which is Exhibit 2045.

35. Dr. Jones testified that Dr. Molly Kibenge was unable to consistently reproduce the positive findings for ISA virus. The samples were sent to Dr. Fred Kibenge at the AVC Lab to see if he could reproduce the results. Dr. Fred Kibenge was able to confirm some positives, however, some of the positives Dr. Fred Kibenge obtained were those that Dr. Molly Kibenge had originally found to be negative.[51]

36. Dr. Jones testified that "a positive result or a negative result really didn't mean much until we could get some evidence of consistency and reproducibility."[52] Ultimately Dr. Jones concluded that the findings that Dr. Molly Kibenge had produced were not representative of ISA.[53]

37. Dr. Fred Kibenge testified that, to the best of his knowledge, the draft manuscript prepared by Dr. Molly Kibenge (Exhibit 2045) was never published as the results were considered by Dr. Jones to have been obtained due to contamination.[54] Dr. Jones testified that he felt that the draft manuscript didn't achieve the standards required in order for it to be considered publishable.[55]

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[49] Transcript, December 15, 2011, pp. 25-26 (Dr. Fred Kibenge)
[50] Transcript, December 16, 2011, p. 60 (Dr. Fred Kibenge); Transcript, December 19, 2011, p. 57 (Dr. Simon Jones); Exhibit 2045 (Asymptomatic infectious salmon anaemia in juvenile *Oncorhynchus* species from the North West Pacific Ocean)
[51] Transcript, December 16, 2011, p. 127 (Dr. Simon Jones)
[52] Transcript, December 16, 2011, p. 127 (Dr. Simon Jones)
[53] Transcript, December 16, 2011, p. 128 (Dr. Simon Jones)
[54] Transcript, December 15, 2011, pp. 26, 92 (Dr. Fred Kibenge)
[55] Transcript, December 19, 2011, p. 5 (Dr. Simon Jones)

38. DFO did not advise the Soowahlie Band or the Sto:lo First Nation of Dr. Molly Kibenge's findings with regard to the potential presence of ISA virus in Cultus Lake sockeye salmon.[56] Nor did DFO notify the Cultus Lake Recovery Team of these findings.[57]

39. Dr. Jones was not aware if further testing of Cultus Lake sockeye salmon had been undertaken since 2004 to test for the presence of ISA virus.[58] Dr. Jones himself has not suggested to anyone that additional sampling and testing for ISA virus in Cultus Lake sockeye salmon be carried out.[59]

40. Dr. Fred Kibenge testified that Dr. Molly Kibenge's results suggest the need to have further research done in the field and that he would have expected that these results would have been followed up on.[60] The FNC agrees. The FNC submits that DFO had, and still has, an obligation to inform First Nations about the results of Dr. Molly Kibenge's research, and to conduct further research and testing to learn more about the potential impacts of ISA virus on wild fish on which First Nations depend, including for their food, social and ceremonial needs. The fact that no one from DFO advised First Nations about the results of this research (inconclusive or not) represents a breach of the Crown's legal obligations owed to First Nations. The failure to inform also serves to undermine current efforts to develop co-management structures that must be based on a foundation of open and honest communication, a shared information base, and trust.

41. In addition, the FNC submits that Dr. Molly Kibenge's research from the early 2000s provides a critical context in which to understand the test results for ISA virus from the fall of 2011. As Dr. Fred Kibenge testified:

> **When we reported the two positives in the sockeye smolts, there was a very strong reaction from CFIA that this is a new finding, this has never been recorded in B.C. and so on. And it just occurred to me that, actually, there was some information to that effect that I was aware of, and my expectation was that if CFIA had this information, they'll be probably better informed and find they are dealing with this whole result.** So my inclination was initially to ask Dr. Molly Kibenge if she could check with (indiscernible) to see if that work could be published. When the information came back that it would

[56] Transcript, December 19, 2011, p. 95 (Dr. Simon Jones)
[57] Transcript, December 19, 2011, p. 95 (Dr. Simon Jones)
[58] Transcript, December 19, 2011, p. 57 (Dr. Simon Jones)
[59] Transcript, December 19, 2011, pp. 57-58 (Dr. Simon Jones)
[60] Transcript, December 16, 2011, p. 60 (Dr. Fred Kibenge)

> not be published, then I thought that at least we could make this information aware to CFIA....So that they would use that information in their own understanding of the results and what we were finding.[61]

42. The results of Dr. Molly Kibenge's research were not previously shared with First Nations, and were not disclosed to the Commission until November 2011. But for the sampling and testing conducted in the fall of 2011, and the Commission's decision to re-open the hearings on the topic of ISA virus, this information would still not be available.[62]

43. Dr. Jones was interviewed by Commission Counsel and testified in the Inquiry in September of 2011. Prior to his testimony in the Inquiry, Dr. Jones was asked to produce all relevant documents in his possession that pertained to the work of the Inquiry.[63] This request was also made of other witnesses. Dr. Jones was aware of the dialogue in the public realm about the concern of ISA virus being present in wild Pacific salmon.[64] Yet neither Dr. Jones, nor any other DFO employee who would have been aware of Dr. Molly Kibenge's research, produced such information to the Commission until November 2011. When questioned about this potential oversight in terms of disclosure, Dr. Jones testified that he considered Dr. Molly Kibenge's findings to be "a failed experiment" as they weren't reproducible and, for this reason, he did not feel the information was of significance to the Inquiry.[65]

44. DFO failed to disclose information regarding Dr. Molly Kibenge's work on ISA virus to the Inquiry and to First Nations. This failure casts doubt over DFO's stated transparency in its information sharing procedures, including its response to potential findings of reportable disease.

V. CFIA AND DFO RESPONSE TO TESTS FOR ISA VIRUS CONDUCTED IN FALL 2011

a. Assessments of the AVC Lab and the Moncton Lab

45. Following the report from the AVC Lab stating that the ISA virus had been found in BC, and the report from the Moncton Lab noting that its findings were inconclusive, the CFIA,

[61] Transcript, December 15, 2011, pp. 92-93 (Dr. Fred Kibenge)
[62] Transcript, December 19, 2011, p. 38 (Dr. Kim Kiotins)
[63] Transcript, December 16, 2011, p. 125 (Dr. Simon Jones)
[64] Transcript, December 16, 2011, p. 125 (Dr. Simon Jones)
[65] Transcript, December 16, 2011, pp. 125-128 (Dr. Simon Jones)

which has the regulatory mandate to investigate suspicion of ISA virus, initiated an assessment of two of the diagnostic laboratories involved in testing the samples.

46. Dr. Fred Kibenge was informed by the CFIA that it wanted to compare the methods used in the Moncton Lab with those used in the AVC Lab for the purpose of understanding how to best move forward collaboratively.[66]

47. Dr. Timothy Davis, a Veterinarian and Animal Health Program Specialist for CFIA in Moncton, assisted in preparing CFIA to undertake the assessment of the two laboratories.[67] As part of this preparatory work, Dr. Davis spoke with Ms. Gagné at the Moncton Lab – one of the laboratories that would be subject to the assessment. Ms. Gagné provided the assessment team with some suggestions on things to look for relating to conducting RT-PCR tests, and things to consider based on Dr. Fred Kibenge's report.[68] Dr. Davis wrote that it was "too bad" CFIA couldn't bring Ms. Gagné to conduct the assessment of Dr. Fred Kibenge's lab.[69]

48. Dr. Fred Kibenge testified that he was "quite surprised" that Ms. Gagné had been consulted about his test results prior to the assessment of the AVC Lab.[70] Dr. Fred Kibenge was not asked to provide input into the Moncton Lab.[71] Dr. Kim Klotins, Acting National Manager of the Disease Control and Contingency Planning Section of the Aquatic Animal Health Division in the Policy and Programs Branch of CFIA,[72] testified that Dr. Fred Kibenge was not sought out to provide input into developing a laboratory assessment "as he's the one being assessed."[73]

49. Dr. Fred Kibenge testified that when the assessment team arrived at the AVC Lab, the purpose of the assessment revealed itself not to be what he had been led to believe, but rather that CFIA was seeking to confirm an hypothesis that had already been

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[66] Transcript, December 16, 2011, p. 56 (Dr. Fred Kibenge)
[67] Transcript, December 16, 2011, p. 117 (Dr. Kim Klotins)
[68] Transcript, December 16, 2011, p. 52 (Nellie Gagné); see also Exhibit 2135 (Email from Timothy Davis and attached PCR Issues dated October 20, 2011)
[69] Exhibit 2101 (Email from Timothy Davis, Fwd: Re: PEI dated October 19, 2011)
[70] Transcript, December 16, 2011, p. 56 (Dr. Fred Kibenge)
[71] Transcript, December 16, 2011, p. 56 (Dr. Fred Kibenge)
[72] Transcript, December 16, 2011, pp. 84-85 (Dr. Kim Klotins)
[73] Transcript, December 16, 2011, p. 119 (Dr. Kim Klotins)

communicated to the media, namely, that there were no conclusive tests confirming the presence of ISA virus in BC's wild fish:

> Before I was made aware of the actual lab assessment, we had spoken with the several senior people in CFIA, and they had told me that they may want to compare our methods to the lab in Moncton, but for the purposes of understanding how best we can move forward with what we are doing. When the lab assessment was presented to me, it was presented as an assessment between two labs, the DFO Moncton lab and the AVC lab. And at that point my view was that it's, you know, being done fairly.
>
> **I was not aware that actually they first consulted the DFO Moncton lab for what issues to look for, and then set up this assessment. ...At the time of the site visit, I quickly got aware that actually the purpose of the site visit itself was not to do the things that I had been made to understand from the conversation with the senior officials in CFIA, and the collection of the lab documents, it was actually, in my view, to confirm a hypothesis that had already been communicated in the media.** I expressed that very strongly to people I was working with. And when we got the report, I think a draft report a few days ago, I had to respond, and I think I made that aware to the person who was in charge of this lab assessment.[74]

50. Dr. Fred Kibenge went on to testify that:

> **...the way the lab assessment was presented to me initially was along the lines of understanding my testing, my methods, comparing them to DFO Moncton, to see if we can improve our knowledge and move forward.** I got a sense that I felt that probably was not the purpose at the time of the site visit. And this was based on my sense of the questions they were asking and the way they wanted the inspection to take place. I can briefly mention that the normal process, and this again goes along the points of being a veterinarian. If you are going to inspect in a place, particularly where you suspect there is infection or something like that, you usually try to move from the cleanest area to the dirtiest area. In my view, at least the way I had been presented with this lab assessment, I assumed they were just planning to look at where I work and see how they can best improve on -- on the methods we are sharing with the DFO Moncton. But the first thing I was told, actually at the time of the inspection was that, no, we are not going to move from the cleanest to the dirtiest. We want to follow the sample. And in reference actually what they meant was the 48 samples that I had received from SFU. So beginning there, and then the subsequent

[74] Transcript, December 16, 2011, pp. 56-57 (Dr. Fred Kibenge)

> questions, **I realized that this was not about the objectives of the particular lab assessment I had been led to believe, it was actually a method to collect the information to support a hypothesis they had come with.**
>
> Q: And that hypothesis was that you were wrong?
>
> DR. KIBENGE: Well, yeah, **based on actually the questioning I got, I sensed that the interest here was to confirm that my result was a result of contamination. The second point was that probably I was doing shoddy science.**
>
> Q: Yes.
>
> DR. KIBENGE: And I think there was a third thinking that I felt they wanted to confirm, and I made that very clear to ... CFIA in my response to them.
>
> **Q: You concluded that they were there to discredit your results, correct?**
>
> **DR. KIBENGE: That's the term someone else who was familiar with that inspection of -- that CFIA used, and I couldn't disagree.**[75]

51. The FNC submits that the prior interaction of Ms. Gagné with the CFIA in the work leading up to the assessments suggests that the laboratory assessments were not conducted independently from DFO.

52. The FNC submits that the CFIA organized and carried out an assessment of the AVC Lab not to do as had been explained to Dr. Fred Kibenge – to compare laboratories and share information to determine how best to move forward – but rather to discredit the positive findings of ISA virus he had reported and to support the statements that both DFO and CFIA had made in the media that Dr. Fred Kibenge was erroneously undertaking "unfounded" or "shoddy" science.

53. Two draft assessments have been produced following the on-site laboratory visits. Dr. Klotins testified that the assessment team drafted the 75-page written assessment of the AVC Lab first, and that the written assessment of the Moncton Lab (currently only 11 pages) is in the process of being completed.[76] The FNC submits that little to no weight should be placed on the draft written assessment of the AVC Lab, dated December 14,

[75] Transcript, December 16, 2011, pp. 68-69 (Dr. Fred Kibenge)
[76] Transcript, December 19, 2011, p. 6 (Dr. Kim Klotins)

2011 (Exhibit 2075), given that the accompanying written assessment for the Moncton Lab (Exhibit 2074) is not yet in a similar state. The FNC submits that the assessment team's relative haste in completing the written assessment of the AVC Lab while failing to draft an assessment of the Moncton Lab further supports the inference that CFIA is seeking to discredit the AVC Lab, while sheltering the Moncton Lab from similar critique.

54. The FNC submits that the several reasons provided by Dr. Fred Kibenge as to why the AVC Lab could have obtained positive results for ISA virus on the 48 sockeye while the Moncton Lab yielded only inconclusive results are credible. Dr. Fred Kibenge and Ms. Gagné noted that the laboratories:

a. Used different primer probe sets;[77]

b. Ran a different number of cycles (the AVC Lab runs 45 cycles; while the Moncton Lab runs 40 cycles);[78]

c. Tested the samples at different times and therefore when they were in differing states of degradation. (Dr. Fred Kibenge noted that if a sample is degraded the most likely result will be to get a negative, not a positive[79]); and

d. Operated with different levels of experience (the Moncton Lab has very little experience testing Pacific salmon).[80]

55. In addition, Dr. Fred Kibenge noted that it was difficult to compare laboratories or results when using field samples.[81] Using an experimental sample would, in Dr. Fred Kibenge's view, be the best and most objective way to compare laboratories:

> In my view, the best way to compare labs, if that was an issue in terms of repeatability or reproducibility of results, would be to have an experimental sample in which there is a known amount of virus, that sample to be distributed blind, so that each lab can use their methods, and that way that will be a very effective way, a very objective scientific way of comparing the labs. In which case, if they can't have the same results, then there is a problem. But to compare labs based on field samples and particularly in this case

[77] Transcript, December 16, 2011, p. 38 (Dr. Fred Kibenge); Transcript, December 15, 2011, pp. 33-34 (Dr. Fred Kibenge)
[78] Transcript, December 16, 2011, p. 37 (Dr. Fred Kibenge)
[79] Transcript, December 16, 2011, p. 18 (Dr. Fred Kibenge)
[80] Transcript, December 16, 2011, p. 19 (Nellie Gagné)
[81] Transcript, December 15, 2011, p. 31 (Dr. Fred Kibenge)

> where even the virus may be so variable that using real time on two separate segments you can't even pick up the same fish, it becomes a bit difficult...[82]

56. In addition, tests that are currently being used for the detection of ISA virus were developed based on the virus infection in farmed Atlantic salmon.[83] As Dr. Fred Kibenge testified, the fact that the tests used were designed for testing the presence of ISA virus in farmed Atlantic salmon, may pose a problem when those same tests are applied to test wild Pacific salmon:

> So clearly the tests we are using are designed for farmed Atlantic salmon, and we are applying them to tissue samples from wild fish, where we don't have very good information. But even if it was for farmed Atlantic salmon, the distribution of virus in the different tissues cannot be expected to be the same. In my case, for example, I received the samples that were heart, and the other labs were getting gills or kidney, and it's very difficult to expect that all those labs will have exactly the same results. So just on the basis of the tissues alone, it's very difficult to expect that you have agreeable results, let alone when you introduce the variations in the testing methods for the primers, probes, the different targets and so on.[84]

57. The FNC submits that further research is required in order to improve the tests used to detect ISA virus, as well as other viruses, in wild Pacific salmon.

b. DFO's Response to Dr. Kristi Miller's Research

58. Dr. Miller testified that, as a result of her research on the presence of ISA virus or an ISA-like virus in wild and farmed fish, she has experienced alienation from her DFO colleagues. Specifically, Dr. Miller testified as follows:

> Q: Let me ask you more generally, as a result of these findings of ISA, have you felt any pressure or adverse reaction from your other superiors?
>
> DR. MILLER: **I'm pretty alienated in the department at the moment so the end result of all of this is I'm not included in any conversations about any of this so once I reported this**

[82] Transcript, December 15, 2011, pp. 33-34 (Dr. Fred Kibenge)
[83] Transcript, December 15, 2011, pp. 31-32 (Dr. Fred Kibenge)
[84] Transcript, December 15, 2011, p. 32 (Dr. Fred Kibenge)

> **information on the 24th [of November 2011], nobody in the department talked to me about disease or ISA after that.**[85]

59. Dr. Miller went on to testify:

> **There was the general feeling that we shouldn't be looking so closely at disease if we didn't -- if we weren't one of the NAAHP** [National Aquatic Animal Health Program] **labs and didn't understand the ramifications.**[86]

60. Dr. Miller, who has a large genomics program that relies on an extensive sampling inventory, also testified as follows:

> **I personally took a level of intimidation at the idea of my samples perhaps being taken away.** I don't know what he [Stephen Stephen] meant – you know, I mean, it was said to me by a number of different individuals over and over again, and of course I did read about what happened to Rick Routledge's samples in his freezer in his graduate students' program when CFIA took away all those samples and they weren't able to continue with the research that they were doing. Of course, I look at my own program and I think I have a lot to lose here if CFIA decided to sweep in and take all my samples. I've got thousands of samples and a very big program in jeopardy, so whether Stephen Stephens [sic] meant that or not, I certainly have been very concerned about that.[87]

61. Dr. Miller stated:

> I think he [Stephen Stephen] just intimated that I, as a scientist, would not understand the complexities of these issues and that, as a scientist, I should not be undertaking research on something if I didn't understand the ramifications of what the results could do.[88]

62. Stephen Stephen, the Director of Biotechnology and Aquatic Animal Health Science Branch with DFO,[89] testified that he told Dr. Miller that until CFIA started its investigation into the potential presence of ISA virus in wild fish in BC, further sampling should be deferred, as a planned approach was necessary.[90] Under cross-examination, Mr. Stephen agreed that scientists should not be required to consider the political

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[85] Transcript, December 15, 2011, p. 109 (Dr. Kristi Miller)
[86] Transcript, December 15, 2011, p. 56 (Dr. Kristi Miller)
[87] Transcript, December 15, 2011, p. 127 (Dr. Kristi Miller)
[88] Transcript, December 15, 2011, p. 127 (Dr. Kristi Miller)
[89] Transcript, December 16, 2011, p. 84 (Stephen Stephen)
[90] Transcript, December 16, 2011, p. 108 (Stephen Stephen)

ramifications of their work and that their responsibility as scientists is to conduct their work in an objective way.[91]

63. The FNC submits that scientists conducting important research and diagnostic work on ISA or other viruses that are potentially affecting wild and farmed salmon should be free to pursue this work and should be supported by an environment that is open to accepting their results. The FNC submits that such science should be conducted in a cooperative and multi-disciplinary manner, involving those with on-the-ground experience and knowledge, including Aboriginal Traditional Knowledge ("ATK").

c. The War to be Won: Government Communications about the 2011 Test Results

64. Dr. Fred Kibenge testified that "negative findings are very easy to deal with because those are the default. Once you report a negative, there's no question, people move on. It's the positive findings that are difficult to accept..."[92] The FNC submits that the communications from DFO, the CFIA, as well as the Province following the release of Dr. Fred Kibenge and Dr. Nylund's results demonstrate how "difficult to accept" the governments have found these positive results to be.

65. The FNC submits that several of the public statements made by DFO, the CFIA, and the Province are misleading and mischaracterize the test results that the AVC Lab, the Norway Lab, and the Moncton Lab reported. The CFIA, for its part, appears to have treated communicating about the test results for ISA virus as a war to be won, as opposed to an effort to understand if wild fish were being affected by viruses or disease and whether this would have impacts for CFIA's mandate of facilitating safe trade of aquatic animals.

66. What follows are certain key communications from DFO, the CFIA and the Province on this issue.

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[91] Transcript, December 19, 2011, p. 69 (Stephen Stephen)
[92] Transcript, December 16, 2011, p. 34 (Dr. Fred Kibenge)

67. On November 7, 2011, DFO's Minister's Office requested that a letter be prepared to send to United States senators and members of congress including the following "key messages":

> Testing:
> **Our official lab in Moncton has completed the first tests and we can confirm that all samples which have previously been reported as infected with ISA have tested negative in our lab. The samples show no signs of the disease.**
>
> Lab review:
> We have contracted an **independent review into the conduct of both laboratories to determine how a false positive could have been obtained** - looking at diagnostic procedures, handling of samples and assessment of practises.
>
> Public confidence:
> The public can be confident in our current review and management practises - between the federal and provincial governments, we've tested over 5000 samples and none have tested positive for the disease. Our management practises are clearly working. Should we be required to adjust our practises in the future due to new data, we are prepared to adjust our review and management practises accordingly.[93]

68. On November 9, 2011, DFO's Minister and the provincial Minister of Agriculture made a public statement regarding the ISA virus test results. DFO's Minister stated:

> Our government takes the health of our fisheries very seriously. We have taken appropriate and immediate action to follow up on the allegations of the presence of ISA in BC waters. **We can now confirm that, preliminary analysis, using proper and internationally recognized procedures, has found that none of the samples has tested positive for ISA.** In recent years, over 5000 fresh, properly stored and processed salmon have been tested by the BC government and Fisheries and Oceans Canada and there has never been a confirmed case of ISA in British Columbia salmon. An active, science-based sampling program continues for both farmed and wild salmon.[94]

69. The provincial Minister noted:

> **It is vitally important that we base our policy decisions on sound science** so as to preserve and protect BC's reputation as a reliable supplier of high quality seafood to the world. This is

[93] Exhibit 2137 (Email entitled "Urgent Draft Letter Required asap please" dated November 7, 2011)
[94] Exhibit 2089 (Ministers' Statement, November 9, 2011)

> particularly true for the dozens of coastal communities that rely on wild and farmed fisheries to feed their families and maintain their way of life. **Reckless allegations based on incomplete science can be devastating to these communities and unfair to the families that make a living from the sea.** Since Premier Clark is currently on a trade mission to China, I have personally asked her to reassure our valued trading partners that now as always BC can be relied upon as a supplier of safe, sustainable seafood.[95]

70. On November 9, 2011, the CFIA posted an Information Bulletin with the heading "No Confirmed Cases of Infectious Salmon Anaemia in British Columbia". The Bulletin provided as follows:

> Based on analysis conducted by the Canadian Food Inspection Agency (CFIA), in close collaboration with Fisheries and Oceans Canada (DFO), the Province of British Columbia and the Atlantic Veterinary College, there have been no confirmed cases of infectious salmon anaemia in wild or farmed salmon in BC.
>
> ...
>
> **DFO has tested all 48 samples received as part of the original reports and the results are all negative for the virus. These results are consistent with the findings of an independent laboratory in Norway, which also tested samples associated with this investigation and provided a report to the CFIA.**[96]

71. Also on November 9, 2011, Joseph Beres, CFIA's Inspection Manager and one of the co-leaders for the team investigating and responding to the ISA virus in BC,[97] wrote to Mr. Stephen, Dr. Klotins, and others stating: "it is clear that we are turning the PR tide to our favour".[98] He went on to write "**one battle is won, now we have to nail the surveillance piece, and we will win the war, also**".[99]

72. On December 2, 2011, DFO's Minister made another statement on the testing for ISA virus (the "December 2nd Statement"). He stated:

> After Canada's reputation has needlessly been put at risk over the past several weeks because of speculation and unfounded science, additional in-depth, conclusive tests, using proper and internationally recognized procedures, are now complete and we

[95] Exhibit 2089 (Ministers' Statement, November 9, 2011)
[96] Exhibit 2021 (CFIA News Release, November 9, 2011)
[97] Transcript, December 16, 2011, p. 110 (Dr. Kim Klotins)
[98] Exhibit 2110 (Email from Joseph Beres to Stephen Stephen and others dated November 9, 2011)
[99] Exhibit 2110 (Email from Joseph Beres to Stephen Stephen and others dated November 9, 2011)

> can confirm that there has **never been a confirmed case of ISA in BC salmon, wild or farmed.**[100] [emphasis in original]

73. The FNC submits that it is inaccurate for DFO and the Province to characterize the tests undertaken by the AVC Lab or the Norway Lab as "un-sound science", "unfounded science" or "speculation."[101] There is no evidence that either of these laboratories failed to adhere to the necessary standards. Dr. Fred Kibenge testified that his science is both valid and founded on proper techniques, and it was inconceivable that DFO's December 2nd Statement could have been directed at him.[102]

74. The FNC further submits that to state that DFO's tests on the 48 sockeye were "conclusive" or "all negative" for ISA virus is incorrect. Ms. Gagné and Dr. Wright both testified that they would not have reported the results from the Moncton Lab as such, but would rather have used the term "inconclusive."[103] Dr. Wright testified that there have not been any conclusive tests.[104] Nor is it correct to state that the results from the Moncton Lab are "consistent" with those from the Norway Lab, as Dr. Nylund's tests yielded one positive result for ISA virus, whereas the Moncton Lab's tests were inconclusive.

75. With regard to the point that there has "never been a confirmed case of ISA in BC salmon, wild or farmed" contained in the December 2nd Statement, Dr. Miller wondered if the phrase was a "play on words."[105] While accurate that there has never been a confirmed case of ISA **disease** in wild salmon, tests from the fall of 2011 have shown positive results for ISA **virus.** If a play on words, as suggested by Dr. Miller, the FNC submits that this type of semantic game has no place in reporting on important scientific matters. The FNC submits that, read as a whole, the messaging from DFO, CFIA and the Province has been misleading and, in several instances, inaccurate. The FNC submits that the evidence suggests at least one reason why the messaging was not

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[100] Exhibit 2004 (Statement, Federal Minister of Fisheries and Oceans, December 2, 2011)
[101] Transcript, December 19, 2011, p. 72 (Stephen Stephen): Mr. Stephen would have said "unconfirmed science" not "unfounded science."
[102] Transcript, December 15, 2011, p. 132 (Dr. Fred Kibenge)
[103] Transcript, December 15, 2011, p. 6 (Nellie Gagné); Transcript, December 16, 2011, pp. 16, 21, 22, 25-28 (Nellie Gagné); Exhibit 2136 (Email from Peter Wright re: inconclusive as an interpretation, dated November 18, 2011): Dr. Wright writes that the "results must be considered as inconclusive at this time because of the poor quality of the samples received which prevent the detection of the virus with any reasonable confidence."
[104] Transcript, December 19, 2011, pp. 81-82 (Dr. Peter Wright)
[105] Transcript, December 15, 2011, p. 132 (Dr. Kristi Miller)

entirely accurate. The evidence shows the Minister directing what the messaging should be.

76. The FNC submits that the email from Mr. Beres (Exhibit 2110) suggests that senior CFIA employees tasked with investigating the findings of ISA virus in BC are treating the matter as a battle or a war to be won. Mr. Beres' aim seems to be convincing the public that there is no ISA virus or disease. Dr. Klotins also spoke to this matter as follows: "So we basically knew right from the beginning we probably wouldn't be able to confirm the results, but we wanted to get an idea of whether ISAV actually exists out there or not, and which is why we did some of the testing, corroborative testing."[106] She went on to note that this was so because CFIA "had no oversight in the collection of the samples."[107] The FNC submits that this is indication that CFIA approached the detection with a view to finding that there was no ISA virus, rather that considering, with an open, scientific and analytic process, whether the presence of ISA virus in wild salmon in BC was a reality.

d. The Need for Sampling and Surveillance

77. The FNC submits that, despite draft policies, such as the Aquatic Animal Health Functional Plan ("AAHFP") that refers to CFIA working collaboratively with all stakeholders and provides that "the provinces, industry, **First Nations**, and academia **play a role on many levels, primarily in the detection and reporting of animal disease at the earliest possible moment**,"[108] both DFO and the CFIA have approached the notion of conducting further sampling of wild fish for the presence of ISA virus in a largely non-collaborative manner.

78. On November 4, 2011, in an email to Dr. Cornelius Kiley, CFIA's Acting Director of the Aquatic Animal Health Division, Dr. Klotins wrote, "**I'm thinking we should also advise all laboratories in Canada to not test any more samples of wild finfish for ISAV from the Pacific Ocean.**"[109] Dr. Klotins testified that this was "just an idea" she had put forward because CFIA had been dealing with a "chain of custody issue".[110] Dr. Klotins

[106] Transcript, December 16, 2011, p. 96 (Dr. Kim Klotins)
[107] Transcript, December 16, 2011, p. 96 (Dr. Kim Klotins)
[108] Exhibit 2105 (Aquatic Animal Health Functional Plan), pp. 39-41
[109] Transcript, December 16, 2011, p. 91 (Dr. Kim Klotins); Exhibit 2104 (Email from Kim Klotins to Cornelius Kiley dated November 4, 2011)
[110] Transcript, December 16, 2011, pp. 91-92 (Dr. Kim Klotins)

testified that she preferred that CFIA start something over which it had oversight and that could be confirmed in the long run.[111] CFIA did not specifically adopt Dr. Klotins' suggestion.

79. In the fall of 2011, First Nations specifically asked DFO whether they should be conducting sampling of the fish in their territories and sending such samples for testing to determine if ISA or other viruses are present. There is no evidence that anyone within DFO encouraged this sampling to be undertaken.[112]

80. Other DFO employees, however, such as Dr. Miller, have noted the extraordinary value of having First Nations people observing salmon in their natural environment and providing researchers with their observations.[113]

> Q: And, for example, if you got an email now from an aboriginal fisheries manager saying, look, in light of everything that we are hearing about ISA virus, should we get samples to you, you wouldn't actively discourage them from sending samples and saying, you know, this is not really an issue?
>
> DR. MILLER: I've been pretty open about receiving those kind of samples.[114]

81. In addition, the FNC submits that while the Draft Surveillance Plan (Exhibit 2112) that is currently under development is an important next step in advancing disease surveillance in wild and farmed fish, there are many improvements still required in order to make this an effective response. A thorough surveillance plan is especially important given that the CFIA has never sampled wild fish.[115] Some of these improvements to the Draft Surveillance Plan include, but are not limited to:

a. Targeting for surveillance species that are not only of "trade significance" and/or "regional freedom significance,"[116] but also targeting those species that are of significance to First Nations for their food, social and ceremonial needs;

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[111] Transcript, December 16, 2011, pp. 91-92 (Dr. Kim Klotins); Exhibit 2104 (Email from Kim Klotins to Cornelius Kiley dated November 4, 2011); see also Transcript, December 19, 2011, p. 48 (Dr. Kim Klotins)
[112] Transcript, December 19, 2011, pp. 90-92
[113] Transcript, December 15, 2011, p. 137 (Dr. Kristi Miller)
[114] Transcript, December 15, 2011, p. 137 (Dr. Kristi Miller)
[115] Transcript, December 19, 2011, p. 49 (Dr. Kim Klotins)
[116] Exhibit 2112 (Draft Surveillance Plan for ISAV, IPNV, and IHNV in Anadromous Salmonids in British Columbia), p. 12

b. Ensuring that fish are collected not only from enhancement facilities[117] and processing plants,[118] but also from rivers and lakes that are spawning and rearing areas for conservation units ("CUs") that are important to First Nations;

c. Working collaboratively with DFO's Stock Assessment Division and with First Nations to conduct the necessary sampling in their territories;

d. Ensuring that the surveillance plan is flexible enough to expand to include a broad range of new and emerging disease organisms;[119]

e. Ensuring that there are effective methods to accurately test for the diseases that are captured within the surveillance plan;[120]

f. Ensuring that sufficient numbers of fish are sampled for sufficient periods of time in order to provide an accurate picture of any potential disease impacts;

g. Ensuring that fish are sampled at various life stages to better understand how diseases may affect fish in different environments and of different ages;[121]

h. Ensuring that the surveillance and monitoring plan is transparent;[122] and

i. Realistically assessing the costs of carrying out such a surveillance plan and securing the necessary resources to do so over the long term.

82. The FNC submits that consultation with First Nations is critical to ensuring that the surveillance plan charts a course consistent with the Crown's obligations to First Nations.

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[117] Exhibit 2112 (Draft Surveillance Plan for ISAV, IPNV, and IHNV in Anadromous Salmonids in British Columbia), p. 14
[118] Exhibit 2112 (Draft Surveillance Plan for ISAV, IPNV, and IHNV in Anadromous Salmonids in British Columbia), p. 14
[119] Transcript, December 16, 2011, p. 42 (Dr. Fred Kibenge, Ms. Nellie Gagné); Exhibit 2094 (Recommendations from SFU Think Tank, December 7, 2011)
[120] Transcript, December 19, 2011, p. 60 (Dr. Peter Wright)
[121] Transcript, December 15, 2011, pp. 70-71 (Dr. Kristi Miller)
[122] Transcript, December 16, 2011, p. 42 (Dr. Fred Kibenge, Ms. Nellie Gagné); Exhibit 2094 (Recommendations from SFU Think Tank, December 7, 2011)

e. The Need to Inform and Engage First Nations

83. The FNC submits that DFO and CFIA have failed to inform First Nations about the results from the testing for ISA virus. This failure is all the more pronounced since DFO and CFIA have been providing regular updates to the media, to the commercial fishing industry and the aquaculture industry, and to provincial counterparts.

84. In particular, on November 8 and December 2, 2011, DFO and CFIA provided technical briefings to the media.[123] On November 10, 2011, DFO and CFIA provided technical briefings to the Canadian Council of Fisheries and Aquaculture Ministers and to industry, including Rob Morley for the BC Seafood Alliance, Ruth Salmon for the Canadian Aquaculture Industry Alliance, and Mary Ellen Walling for the BC Salmon Farmers Association.[124] First Nations representatives were not included in any of these briefings. Nor has the CFIA informed First Nations of any research currently underway on ISA virus.[125]

85. CFIA does not currently have a policy that directs or assists its staff in working with First Nations to notify them about suspected diseases.[126] Under CFIA's current practices, if there is a confirmed report of ISA virus, CFIA would notify the OIE as well as its trading partners in both wild and farmed fish. The CFIA would then wait to see how the countries reacted and to identify whether Canada could meet any conditions such countries may impose for importing products.[127] Finally, CFIA would also notify the provinces in case they may wish to impose certain controls.[128] Dr. Klotins testified as follows:

> Q: I take it then that when CFIA receives notice of a suspected disease there's no policy to notify First Nations whose fishing rights might be affected now? At this time there's no policy, but there's an interest in developing one; is that what I heard you say?
>
> DR. KLOTINS: Well, there is some notification of suspect to provincial governments and to the Canadian Council of

[123] Transcript, December 19, 2011, p. 85 (Stephen Stephen)
[124] Transcript, December 19, 2011, pp. 86-87 (Dr. Kim Klotins, Dr. Peter Wright, Mr. Stephen Stephen); Exhibit 2138 (Aquatic Animal Health's Technical Briefing Regarding the Reported Suspect Finding of ISAV in BC)
[125] Transcript, December 19, 2011, p. 99 (Dr. Kim Klotins)
[126] Transcript, December 19, 2011, p. 104 (Dr. Kim Klotins)
[127] Transcript, December 19, 2011, p. 7 (Dr. Kim Klotins)
[128] Transcript, December 19, 2011, p. 7 (Dr. Kim Klotins)

> Aquaculture and Fisheries ministers. If that requires to be expanded, then we need to know about that....
>
> Q: But presently there's no process or policy to do that?
>
> DR. KLOTINS: No.[129]

86. When queried why CFIA had not yet informed First Nations about the testing for ISA virus, Dr. Klotins testified that CFIA hadn't notified First Nations because "we didn't realize there was an agreement to do so."[130] The FNC submits that CFIA and DFO have overlooked the necessity of notifying First Nations at the earliest opportunity regarding the possible presence of ISA virus in the wild fish on which they depend to meet, among other things, their food, social, and ceremonial needs.

87. The FNC submits that the CFIA and DFO must immediately address and improve their communications with First Nations. The FNC suggests that, as a first and preliminary step, CFIA and DFO use the joint DFO-First Nations Fisheries Council ("FNFC") Aquaculture Working Group as a vehicle for providing necessary information to First Nations on fish health and the possible presence of any viruses affecting the health of the wild salmon on which they depend.[131] Furthermore, the FNC submits that CFIA and DFO should enter into a protocol with First Nations with regard to the early notification (i.e. even at the time of receipt of presumptively positive results) about the results of testing for viruses in wild and farmed fish.

88. The AAHFP refers to the Aquatic Animal Health Committee ("AAHC").[132] Current members of the AAHC include the Canadian Aquaculture Industry Alliance, the Fisheries Council of Canada, the Aboriginal Aquaculture Association ("AAA"), the Canadian Veterinary Medical Association, Maritime Aboriginal Peoples Council, Congress of Aboriginal Peoples, provincial representatives, academia, DFO, and CFIA. This committee lacks representation from First Nations in BC, and particularly those that may have concerns about the presence of aquaculture facilities in their territories. The FNC submits that there must be representation from BC First Nations on the AAHC. Dr. Klotins testified that CFIA is open to broadening the membership of the AAHC and that

[129] Transcript, December 19, 2011, p. 103 (Dr. Kim Klotins)
[130] Transcript, December 19, 2011, p. 99 (Dr. Kim Klotins)
[131] Transcript, December 19, 2011, p. 90 (Dr. Kim Klotins)
[132] Exhibit 2105 (Draft Aquatic Animal Health Functional Plan), p. 40

CFIA would make an attempt to increase such participation.[133] The FNC submits that this is another important first step to establish communication between the CFIA and First Nations in BC.

VI. OPPORTUNITIES FOR FURTHER RESEARCH

89. Many of the witnesses identified areas of further research to better understand what type of virus may be present in wild fish in BC, and to better develop a response to the matter. In particular:

a. Dr. Miller testified to a need to get a "fundamental baseline of what viruses and what other pathogens" wild fish in BC may be carrying, and what their potential to cause epidemic levels of disease are;[134]

b. Dr. Fred Kibenge testified that further work is needed to isolate, sequence and conclusively classify the virus that is being detected in wild fish in BC;[135]

c. Dr. Fred Kibenge also noted the need to improve the diagnostic tests to detect the particular viral agent that appears to be affecting wild fish in BC;[136] and

d. Dr. Fred Kibenge recommended establishing experimental infections to detect where the virus is most and when is the best time to sample in order to get a handle on the spread of the virus, wherever it may be.[137]

90. The FNC supports these areas of further research, and encourages including ATK in pursuing the research.

91. In terms of an approach to take to these areas of further research, Dr. Fred Kibenge spoke of the need to encourage laboratories to work together for the common good and to increase the level of knowledge rather than seeking to discredit each other.[138] Dr. Wright similarly recommended using a multi-disciplinary approach to any further work. He noted that epidemiologists, diagnosticians, and researchers must all come

[133] Transcript, December 19, 2011, pp. 88-90 (Dr. Kim Klotins)
[134] Transcript, December 15, 2011, pp. 48-40, 128 (Dr. Kristi Miller); see also Exhibit 2052 (Brad Davis, Identification of the ISAv7 genomic expression profile in the 07/10 44K Liver Microarray data)
[135] Transcript, December 15, 2011, pp. 69-70 (Dr. Fred Kibenge)
[136] Transcript, December 16, 2011, p. 47 (Dr. Fred Kibenge)
[137] Transcript, December 16, 2011, pp. 48-50 (Dr. Fred Kibenge)
[138] Transcript, December 16, 2011, pp. 48-50 (Dr. Fred Kibenge)

together.[139] Dr. Kibenge also recommended the establishment of a funded chair for aquatic virology research.[140] The FNC supports these approaches to conducting the further research outlined above, and encourages including First Nations in these multi-disciplinary approaches.

92. Finally, the FNC agrees with Dr. Fred Kibenge and Ms. Gagné who both testified that work to get further clarity on the extent to which ISA virus or an ISA-like virus might be in BC waters must occur as soon as possible.[141]

VII. RECOMMENDATIONS

93. The FNC submits that the following recommendations are supported by the evidence and are reasonable and necessary steps to ensure that: further independent research is conducted; transparent communications and notification processes are used; and First Nations are properly informed and engaged at the earliest opportunity about potential viruses and diseases that could be affecting the fish on which they rely, including for food, social and ceremonial purposes. These recommendations are not presented in an order of importance.

Recommendation 1: DFO working collaboratively with others should conduct further research to isolate, sequence and conclusively classify the virus that is being detected in Pacific salmon.

Recommendation 2: DFO working collaboratively with others should seek to develop a fundamental baseline of what viruses and pathogens wild Pacific salmon may be carrying and to analyze their potential to cause epidemic levels of disease.

[139] Transcript, December 19, 2011, p. 11 (Dr. Peter Wright)
[140] Transcript, December 16, 2011, pp. 48-50 (Dr. Fred Kibenge)
[141] Transcript, December 16, 2011, p. 41 (Dr. Fred Kibenge, Nellie Gagné)

Recommendation 3: DFO working collaboratively with others should improve the diagnostic tests to detect viral agents that may be affecting wild Pacific salmon, as opposed to relying on diagnostic tests developed for testing viral agents in farmed Atlantic salmon.

Recommendation 4: DFO and CFIA should focus on working collaboratively with independent laboratories.

Recommendation 5: DFO should follow up on the research undertaken by Dr. Molly Kibenge.

Recommendation 6: DFO should encourage its scientists to research potential viruses affecting wild and farmed salmon.

Recommendation 7: DFO should encourage epidemiologists, diagnosticians, researchers and First Nations holding ATK to come together to better understand and develop tests and surveillance plans to detect the presence of viruses in wild and farmed salmon.

Recommendation 8: DFO and CFIA should provide accurate and timely reporting regarding the potential presence of viruses and diseases in wild and farmed Pacific salmon to First Nations, stakeholders, the media, and the public.

Recommendation 9: DFO and CFIA should collaborate with First Nations on the detection and reporting of diseases that may be affecting wild and farmed Pacific salmon.

Recommendation 10: DFO and CFIA should develop and implement a surveillance plan in consultation with First Nations.

Recommendation 11: DFO and CFIA should improve their communications with First Nations on issues relating to the detection, investigation, and reporting on potential viruses and diseases that may be affecting wild and farmed salmon. As first steps, DFO should use the joint DFO-FNFC Aquaculture Working Group as a vehicle to disseminate information to First Nations, and CFIA should broaden the membership on the Aquatic Animal Health Committee to include greater representation of BC First Nations.

Recommendation 12: CFIA should enter into protocols with First Nations regarding early notification of the possible presence of viruses in wild and farmed salmon.

All of which is respectfully submitted this 22nd day of December, 2011.

Leah Pence