



First Nations Health Authority
Health through wellness

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FNHA Fish Testing – FAQ Update *September 23, 2014*

The following are answers to some questions we have been receiving:

How was FNHA involved when the breach happened?

FNHA Environmental Public Health Services connected with the two closely impacted First Nations (Xat'sull Soda Creek First Nation and T'exelc Williams Lake Indian Band) to confirm immediate safety was not affected. Drinking water sources were confirmed to be in areas not affected by the breach. FNHA became aware of fish safety concerns further downstream as the travel of mine tailings moved through the Fraser River. Fear for fish safety, the effects of reduced harvesting, and a request from FN leadership supported the initiation of the fish testing project. Water and sediment results that became available were also interpreted by FNHA staff to provide an independent review. Crisis response supports were made available for those in need.

What chemicals were analysed in the FNHA fish testing project?

Total metals, total mercury, and arsenic speciation analysis was conducted. The metals scan includes those metals which Imperial Metals Corporation was reported to have released into the tailings pond. Arsenic speciation determines what portion of total arsenic is *inorganic*, which is the harmful form. In salmon, it has been previously found in studies that most arsenic is in the non-harmful form.

There were reagents reported to be used in mine processing; were these tested?

We are aware that the mine uses certain surfactants in mine processing, and we have asked for more information on these products. The surfactants are reported to biodegrade in the environment. An additional challenge is in finding a lab that can analyse the reagents, and to date we have not found a lab that can do this. Fish samples that were submitted are being stored and could be used for further analysis of specific reagents, should a lab be found.

Why might salmon have less bio-accumulation than lake trout?

Metal accumulation in fish happens when fish eat other organisms that have high metal concentrations. Fish need to be living in water containing metals for a significant period of time, as well as eating other organisms which have accumulated the metals. This is called bioaccumulation. Fish such as trout, which live long term in Quesnel Lake, have a higher chance to accumulate metals. Accumulation will often take several months to years depending on the metal, the fish species, and the type of tissue (muscle, liver, etc).

Was the number of fish collected of sufficient sample size?

Yes, the minimum number of fish desired was 10 with a goal of 30. The goal was exceeded with a total of 45 fish submitted. This is sufficient to allow for a risk assessment to be made.

What standards were used in assessing the results?

There are no defined “standards”; and instead, *toxicity reference values* for safe intake rates are available. This is the approach recommended by the World Health Organization and Health Canada. Available baseline data is also used to determine if results are within normal ranges found pre-breach. In addition, the quantity of salmon consumed is important in evaluating the overall risk. For this, available data on the typical amount of salmon consumed by First Nations people in BC is used.

How do we know what normal levels are?

The FNHA received contributions of salmon caught in 2013 from First Nations Fisheries departments. The salmon from 2013 would be considered as control samples, since they would not have been impacted by the 2014 tailings breach. Additionally, the First Nations Food Nutrition and Environment Study (FNFNES) conducted in 2008-09 in BC provides data for metals in salmon, as well as information on the typical amount of salmon consumed by First Nations people in BC. More information on the study can be found at: <http://www.fnfnes.ca/>

What do the results so far tell us?

Two leading toxicologists have looked at the muscle tissue data and indicate that most metals are in normal ranges compared to pre-breach, and in all cases metals are below levels of human health concern.

What do the results of the salmon roe and liver tell us?

Because salmon roe and liver are not consumed at the same quantities as muscle, the results need to be analysed differently and considered along with muscle consumption. The data is being evaluated more closely, however at this time the data does not suggest there is a health concern.

Are the current fish results similar to pre-breach data?

Fish results were compared to other available salmon data (Fraser River 2013 salmon and FNFNES data) and most metals are within the range of values found prior to the breach. For metals not in this range, they are still within safe levels.

Does this mean there was no impact on 2014 salmon from the breach?

The purpose of the FNHA fish project was to confirm safety to consume salmon caught during the 2014 salmon run in the Fraser River. In order to determine if there is difference in pre/post tissue levels a statistical analysis would be needed to determine whether any differences are due to chance, or are significant. There is natural variability in levels and the analysis would indicate if there was a true difference. An individual with experience in statistical analysis would be needed to complete that analysis.

What is the ongoing monitoring that is recommended?

Because metals require time to bio-accumulate in fish, ongoing monitoring of salmon runs in 2015 and beyond is recommended to determine if there may be bio-accumulation. The salmon tested in the 2014 run are felt to be representative of the current salmon run and the current Fraser River environment.

Would dried fish have different results?

Dried salmon is expected to be as safe as fresh salmon. We have focused on fresh/frozen salmon so that results can more easily be compared to results prior to the breach (i.e., FNFNES 2008/2009 dataset was focused on fresh salmon). It is noted that whenever food is dried (e.g., fish, moose, berries and other fruit), metals concentrations will appear to increase (sometimes by 5 to 10 times); however, this is purely due to moisture loss of the food and does not represent a health concern, especially since people tend to consume smaller amounts of dry fish compared to fresh fish.

Why are results for dead fish not considered to be reliable?

We generally discourage analysing dead fish since we want food to be examined that could appear on people's plates. And so, analysing dead fish may not be consistent with such typical food harvesting. In addition to this, there is the potential that if a fish has started to decay, some of the tissue may have been infiltrated with river water and/or released some of the cellular components containing metals and so this may not represent the concentrations from live caught fish. Even with that noted, the metals concentrations in the one dead salmon sample seem to be comparable to the fresh sockeye salmon results and none of the concentrations indicate a concern to safety.

Did the lab use detection levels that are able to be compared to consumption guidelines?

Yes, the detection levels were specifically confirmed prior to testing to be low enough in order for results to be compared to the proper guidelines.

Would river water temperatures affect the metals concentration in fish?

Although the water temperature of the Fraser River could have an influence on metabolic rates which some research indicates could increase chemical concentrations, we are not modelling concentrations and instead we are directly measuring tissue. So even if water temperature has an effect, our measurements will reflect this and reflect what a person may eat.

Who carried out the risk assessment and what are their qualifications?

Two internationally recognized experts in risk assessment have assisted to develop the sampling project and interpret the current set of data against available guidelines.

Ross Wilson, Wilson Scientific Consulting Inc. is internationally accredited in the area of toxicology; Diplomat of the American Board of Toxicology (DABT), and appointed as professional expert as a risk assessment specialist (Contaminated Sites Approved Professional Society of British Columbia, CSAP)

Dr. Laurie Chan, Professor and Canada Research Chair in Toxicology and Environmental Health Director, Center for Advanced Research in Environmental Genomics, University of Ottawa

What are other agencies/groups doing?

Ministry of Environment – sediment sampling, water sampling at Quesnel Lake (various depths), Polley Lake, and Hazeltine Creek, including sampling within the plume. Lake fish sampling Aug 9/10 (lake trout, burbot, whitefish, longnose sucker). Are comparing results to BC lake background levels and historical Quesnel Lake trout data. Salmon testing is at lab pending results.

MOE - Mount Polley Incident Updates and Raw Sample Data
<http://www.env.gov.bc.ca/eemp/incidents/2014/mount-polley/>

BC Conservation Officer Service - Independent investigation being conducted since Aug 4.

Ministry of Energy and Mines – daily onsite inspectors for investigation of breach, and oversight of mitigation and remediation work.

Research

University of Northern British Columbia – Quesnel River Research Center - collecting water, sediment, and biological samples from the Quesnel watershed and looking at the movement of water and sediment plumes in Quesnel Lake.
<http://www.unbc.ca/quesnel-river-research-centre>

Imperial Metals Corporation

Responding and taking actions to meet the Pollution Abatement Order issued by MOE.
Temporary dyke built at the impoundment to stop further release of tailings.
Polley Lake water levels have been lowered to reduce potential release of more sediment and debris currently sitting in the lake.
Environmental Impact Assessment being completed and implemented.
Reducing erosion.
Plans for a silt curtain to minimize more sediment from Hazeltine Creek.
Water, sediment and fish sampling (lake fish and Fraser River salmon)
http://www.imperialmetals.com/s/Mt_Polley_Update.asp?ReportID=671668