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Safety Commission**

**Commission canadienne de
sûreté nucléaire**

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Salle de bal Regency
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Peterborough (Ontario)

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TABLE OF CONTENTS

	PAGE
Opening Remarks	1
CMD 20-H2.245/20-H2.245A/20-H2.245B Oral presentation by Citizens Against Radioactive Neighbourhoods	5
CMD 20-H2.29 Oral presentation by Jenny Carter	50
CMD 20-H2.13 Oral presentation by George Fogarasi	65
CMD 20-H2.205/20-H2.205A Oral presentation by David Berger	82
CMD 20-H2.101 Presentation by Curve Lake First Nation	97
CMD 20-H2.17 Oral presentation by Dan Rudka	131
CMD 20-H2.175 Oral presentation by Jason Rogers	161
CMD 20-H2.75/20-H2.75A/20-H2.75B Oral presentation by Steve Daniels	177
CMD 20-H2.139 Oral presentation by Rosana Salvaterra	210
CMD 20-H2.109/20-H2.109A Oral presentation by Kathryn Campbell	238
CMD 20-H2.117/20-H2.117A Oral presentation by Jennifer Logan	256
CMD 20-H2.120/20-H2.120A Oral presentation by Dana Jordan	284

TABLE OF CONTENTS

	PAGE
CMD 20-H2.121/20-H2.121A Oral presentation by Peter Harris	304
CMD 20-H2.133/20-H2.133A/20-H2.133B Oral presentation by Philip Kienholz	335
CMD 20-H2.134/20-H2.134A Oral presentation by Port Hope Community Health Concerns Committee	355
CMD 20-H2.160 Oral presentation by James Wilkes	376
CMD 20-H2.167/20-H2.167A/20-H2.167B Oral presentation by Adam Prinsen	391
CMD 20-H2.187 Oral presentation by Nick Lato	410
CMD 20-H2.201 Oral presentation of Sarah Vandenberg	423
CMD 20-H2.58 Oral presentation by Lainey Bates	432
CMD 20-H2.246 Oral presentation by Jane Scott	450
CMD 20-H2.2 Written submission from Caroline Tennent	471
CMD 20-H2.3 Written submission from Don and Heather Ross	471
CMD 20-H2.4 Written submission from Barbara Russell	471
CMD 20-H2.5 Written submission from Layne and Gail Lewis	472

TABLE OF CONTENTS

	PAGE
CMD 20-H2.6 Written submission from Devon Code	472
CMD 20-H2.8 Written submission from C. & T. Tool & Machine Inc.	472
CMD 20-H2.9 Written submission from Laurie Westaway	473
CMD 20-H2.12 Written submission from Anne Elliott	473
CMD 20-H2.14 Written submission from Jennifer Kazda	473
CMD 20-H2.15 Written submission from Robert Paehlke	473
CMD 20-H2.16 Written submission from Lisa Wood	474
CMD 20-H2.18 Written submission from Karin DesChamp	474
CMD 20-H2.19 Written submission from Emily Straka	474
CMD 20-H2.24 Written submission from Helen Burnaby	476
CMD 20-H2.25 Written submission from Miriam Davidson and Marlowe Bork	476
CMD 20-H2.28 Written submission from Gordon and Claudea Usher	476
CMD 20-H2.30 Written submission from Sheila Collett	477

TABLE OF CONTENTS

	PAGE
CMD 20-H2.34 Written submission from Jennifer Guerin	477
CMD 20-H2.37 Written submission from Philip McMichael	477
CMD 20-H2.38 Written submission from Adam Baker	477
CMD 20-H2.39 Written submission from Ruth Pezzack	478
CMD 20-H2.41 Written submission from Leslie McGrath	478
CMD 20-H2.43 Written submission from Timothy Holland	478
CMD 20-H2.44 Written submission from Anna Tennent-Riddell	478
CMD 20-H2.46 Written submission from Cynthia Conner	479
CMD 20-H2.47 Written submission from Kathy Dunne	479
CMD 20-H2.48 Written submission from Jacqueline Wright	482
CMD 20-H2.49 Written submission from Joshua Benjamin Marston	482
CMD 20-H2.50 Written submission from Lara Elizabeth George	482
CMD 20-H2.52 Written submission from Gwen Stevens	484

TABLE OF CONTENTS

	PAGE
CMD 20-H2.53 Written submission from Mary Garvey	484
CMD 20-H2.54 Written submission from Sarah Thomson	484
CMD 20-H2.59 Written submission from Jonathan Campbell	485
CMD 20-H2.60 Written submission from Anna Eidt	485
CMD 20-H2.62 Written submission from Karen Hjort-Jensen	485
CMD 20-H2.64 Written submission from Drew Ginter	487
CMD 20-H2.69 Written submission from Barton Feilders	487
CMD 20-H2.70 Written submission from Ursula Pflug	488
CMD 20-H2.72 Written submission from Beverley Peever	488
CMD 20-H2.73 Written submission from Katrina Behr	488
CMD 20-H2.74 Written submission from Jessica Rowland	491
CMD 20-H2.76 Written submission from Mathew and Karlie Holtby	491
CMD 20-H2.77 Written submission from Janet Harris	491

TABLE OF CONTENTS

	PAGE
CMD 20-H2.83 Written submission from Stacy Smith Barriault	491
CMD 20-H2.84 Written submission from Erin Parker	492
CMD 20-H2.86 Written submission from Carolyn Ross	492
CMD 20-H2.88 Written submission from Andrew Griffin	492
CMD 20-H2.90 Written submission from Stu Morris	492
CMD 20-H2.91 Written submission from Sharon Fitzgerald	493
CMD 20-H2.94 Written submission from Ava Richardson and Zenryu Owatari	493
CMD 20-H2.95 Written submission from Leanne Simpson	493
CMD 20-H2.96 Written submission from Peter Prinsen	494
CMD 20-H2.97 Written submission from Jonothan Fiddler	494
CMD 20-H2.98 Written submission from Claire Symington	494
CMD 20-H2.100 Written submission from John Climenhage	494
CMD 20-H2.102 Written submission from Michael Phillips	495

TABLE OF CONTENTS

	PAGE
CMD 20-H2.103 Written submission from Cathy Manias-Fiddler	495
CMD 20-H2.106 Written submission from Chris Risley	495
CMD 20-H2.107 Written submission from Katherine Orgill and Bruce Scott	496
CMD 20-H2.110 Written submission from Joanne O'Donoughue	496
CMD 20-H2.111 Written submission from Matt Snell	496
CMD 20-H2.112 Written submission from Adrienne Newman	496
CMD 20-H2.113 Written submission from Charlotte Kennedy	497
CMD 20-H2.115 Written submission from Roy Brady	497
CMD 20-H2.123 Written submission from Ralf Pohlak	497
CMD 20-H2.126 Written submission from Susan Cooper	498
CMD 20-H2.127 Written submission from Rosemary MacAdam	498
CMD 20-H2.128 Written submission from Rebecca Reeves	498
CMD 20-H2.129 Written submission from Danielle Tassie	498

TABLE OF CONTENTS

	PAGE
CMD 20-H2.130 Written submission from Miriam Lyall	499
CMD 20-H2.244/20-H2.244A Oral presentation by Julian Aherne	499
CMD 20-H2.131 Written submission from Timothy Wilson	510
CMD 20-H2.135 Written submission from Stephanie Benn	511
CMD 20-H2.136 Written submission from Ann Jaeger	511
CMD 20-H2.141 Written submission from Robert Gibson	511
CMD 20-H2.145 Written submission from Claudette Beaudoin	511
CMD 20-H2.148 Written submission from Arndt Kruger	512
CMD 20-H2.149 Written submission from John Marris	512
CMD 20-H2.150 Written submission from Andrew Jobs and Sarah Crane	512
CMD 20-H2.153 Written submission from Ken Brown	512
CMD 20-H2.153 Written submission from Anna Petry	513
CMD 20-H2.155 Written submission from Robert Steinman	513

TABLE OF CONTENTS

	PAGE
CMD 20-H2.156 Written submission from Sheila Nabigon-Howlett	513
CMD 20-H2.158 Written submission from Rachel Wortis Beda	514
CMD 20-H2.161 Written submission from Anne White	514
CMD 20-H2.162 Written submission from Pete Hewett	514
CMD 20-H2.163 Written submission from Kendra Couling	514
CMD 20-H2.172 Written submission from Lisa Campbell	515
CMD 20-H2.179 Written submission from Colin Purcell	515
CMD 20-H2.182 Written submission from Corry Prinsen	515
CMD 20-H2.183 Written submission from Caroline (Cara) Peterman	515
CMD 20-H2.185 Written submission from Steven do Vale	516
CMD 20-H2.188 Written submission from Janice Rosen	516
CMD 20-H2.190 Written submission from Jamie Flagg	516
CMD 20-H2.194 Written submission from Barbara Chisholm	517

TABLE OF CONTENTS

	PAGE
CMD 20-H2.197 Written submission from Trevor Middel and Stephanie Melles	517
CMD 20-H2.199 Written submission from Julian Aherne, Gary Burness, James Connolly, Peter Lafleur, Erica Nol, Mark Parnis and Rachel Wortis	517
CMD 20-H2.202 Written submission from Thomas Miller	518
CMD 20-H2.204 Written submission from George Campana	518
CMD 20-H2.209 Written submission from Mary Elizabeth Konrad	518
CMD 20-H2.212 Written submission from Juliette Barriault	518
CMD 20-H2.213 Written submission from Everett Barriault	519
CMD 20-H2.214 Written submission from Jennifer Bowe	519
CMD 20-H2.217 Written submission from Gordon and Caroline Langill	519
CMD 20-H2.218 Written submission from Bruce Harris	520
CMD 20-H2.221 Written submission from Jillian Hansen	522
CMD 20-H2.224 Written submission from Graeme Marrs	522

TABLE OF CONTENTS

	PAGE
CMD 20-H2.226 Written submission from Jennifer Kirkpatrick	523
CMD 20-H2.227 Written submission from Linda Patterson	523
CMD 20-H2.228 Written submission from Fred and Maggie Baker	524
CMD 20-H2.229 Written submission from Rosanna Zerafa	524
CMD 20-H2.230 Written submission from Katherine Fee	525
CMD 20-H2.231 Written submission from Judy Dixon	525
CMD 20-H2.232 Written submission from Annie Gelfand	525
CMD 20-H2.233 Written submission from Susan Chiddix	525
CMD 20-H2.234 Written submission from Craig Niziolek	526
CMD 20-H2.235 Written submission from Laura Pauk	526
CMD 20-H2.236 Written submission from Riki Kretschmar	526
CMD 20-H2.238 Written submission from Christie Nash	526
CMD 20-H2.239 Written submission from Judy Stewart	527

TABLE OF CONTENTS

	PAGE
CMD 20-H2.242 Written submission from Melinda Rees	527
CMD 20-H2.248 Written submission from Catherine Prinsen, Beatrice Chan, James Wilkes, George Campana and 33 interested persons	527
CMD 20-H2.178 Written submission from Bree and Aaron Walpole	528

Peterborough, Ontario / Peterborough (Ontario)

--- Upon commencing on Thursday, March 5, 2020
at 8:30 a.m. / L'audience débute le
jeudi 5 mars 2020 à 8 h 30

Opening Remarks

THE PRESIDENT: Good morning everyone and welcome to the continuation of the public hearing of the Canadian Nuclear Safety Commission. Welcome also to those joining us via webcast and videoconference.

My name is Rumina Velshi, I am the President of the Nuclear Safety Commission.

I would like to begin by recognizing that the land we are gathered on is the traditional territory of the Mississauga Anishnabeg peoples and in the territory covered by the Williams Treaties.

For those who were not here yesterday, I will begin by introducing the Members of the Commission that are with us for this public hearing.

On my extreme right is Dr. Sandor Demeter; to my left are Dr. Stephen McKinnon, Dr. Marcel Lacroix and Dr. Timothy Berube.

Ms Lisa Thiele, Senior General Counsel to the Commission, and Mr. Marc Leblanc, Secretary of the Commission, are also joining us on the podium today.

For the benefit of the Members and for participants in this hearing, I would like to inform you of some special guests that will be joining us today from Environment, Parks and Conservation. They will be with us all day today via webcast and this is an opportunity for us to ask the questions we have been holding for them around environment and remediation and legacy waste and so on.

The Medical Officer of Health for Peterborough will be with us this afternoon where we will ask our questions around health risks and health studies.

And the Fire Chief will be with us this evening and all day tomorrow, so we can get our questions related to fire and emergency preparedness and planning at that time.

I will now turn the floor to Mr. Leblanc for a few opening remarks.

Marc...?

M. LEBLANC: Merci, Madame la Présidente.

During today's business we have simultaneous interpretation. The English version is on

channel 1, et la version française est au poste 2.

We would also ask that you please keep the pace of your speech relatively slow so that the interpreters have a chance to keep up.

The hearing is transcribed in the language that is being used.

I would also like to note that this hearing is being video webcast live and that the hearing is also archived on our website for a three-month period after the close of the hearing.

The transcripts should be available on the CNSC website in about two weeks.

To make the transcripts as meaningful as possible, we would ask everyone to identify themselves before speaking.

As a courtesy to others in the room, please silence your cell phones and other electronic devices.

From a safety standpoint, please note there are five emergency exits in this room.

Yesterday we heard the presentations by BWXT, CNSC staff and 12 intervenors.

Twenty-two intervenors are scheduled to

present orally today. Ten minutes are allocated for each presentation, with the Commission Members having the opportunity to ask questions after each presentation.

To help you in managing your time, a timer system is being used today, as it was yesterday. The light will turn yellow when there is one minute left and turn red at the 10-minute mark.

After the presentations this evening, and time allowing, we will be addressing some of the written submissions. If not, they will be addressed on Friday.

Your key contact persons will be Ms Louise Levert and Ms Julie Bouchard, who are at the reception desk, from the Secretariat staff and you will see them going around at the back of the room if you need information regarding the timing of presentations and other logistical considerations.

We anticipate that there will be a health break around 10:30-10:35 this morning and a lunch break around 12:30-12:45. There will be a dinner break around 5:30 and there will be another afternoon break. So we have a big day in front of us and I wish you a good hearing day.

Madame la Présidente...?

THE PRESIDENT: Thank you.

The first presentation today is from the Citizens Against Radioactive Neighbourhoods, as outlined in CMD 20-H2.245, 245A and 245B.

Ms Kerrie Blaise and Mr. Morten Siersbaek are with us today presenting the submission, and Dr. Edwards and Dr. Markvart are joining us remotely.

The floor is yours. Thank you.

CMD 20-H2.245/20-H2.245A/20-H2.245B

Oral presentation by

Citizens Against Radioactive Neighbourhoods

MS BLAISE: Good morning, Madam President, Members of the Commission. Thank you for the opportunity to address you today in this critical licensing matter regarding BWXT's proposal to conduct pelleting in Peterborough.

You are correct, I am Ms Kerrie Blaise from the Canadian Environmental Law Association, and with me today is co-counsel Morten Siersbaek. A number of members of CARN are also in the audience as well and joining us remotely online.

I would like to begin by acknowledging

that we are on the Treaty 20 Mississauga Anishinaabeg Territory and as guests to these lands we recognize that we have a responsibility to protect the health integrity of this air, land and water.

Our client, the Citizens against Radioactive Neighbourhoods, is a non-profit organization. Its members live and reside in Peterborough, and for many, their children attend the school which is located just metres from the BWXT facility.

CARN, as I will refer to them today, was formed in order to raise awareness about nuclear facilities and the need for strong human health and environmental safeguards. Leading up to this hearing, CARN, too, hosted many information sessions which attracted hundreds of participants.

As the work of CARN and all of its members underscores, the Commission, acting in the public interest and their authority under the *Nuclear Safety and Control Act*, cannot issue a 10-year licence that would be flexible in allowing for permitting in Peterborough for the simple reason that the Commission lacks the information and evidentiary basis to do so.

By way of brief introduction,

Mr. Siersbaek and myself are legal counsel at the Canadian Environmental Law Association. We are a public interest non-profit founded in the 1970s and we are a clinic of Legal Aid Ontario.

Today we will provide a high-level review of our findings which demonstrate why this licence should be denied.

First, a 10-year licence is not appropriate. We have heard that public awareness about BWXT, its operations, its facilities is poor and its engagement is ineffectual, and despite encouraging words from the Commission and CNSC staff that they have heard public concerns and that they are committed to enhancing public engagement in the process, this cannot be accomplished if the next licence occurs -- or the next licensing hearing occurs in 10 years.

And BWXT isn't ready for a 10-year licence. This has been demonstrated by their already poor engagement record and a lack of public openness in sharing documents.

As you have heard, there is a high level of community concern about potential human health risks arising from the proposal to pellet in Peterborough and

this has been further heightened by the recent Environmental Monitoring Reports showing beryllium levels in soil to be highest at the Prince Of Wales Elementary School.

And because so many issues aren't before the Commission, including whether BWXT has a social licence to operate, the socioeconomic impacts have been considered, intergenerational harms and alternatives to the proposal, to name just a few, the CNSC should work with federal ministers to ensure more nuclear projects are covered by our federal *Impact Assessment Act*.

And, as our experts, Dr. Markvart and Dr. Gordon Edwards have concluded -- who I believe have joined us remotely today over the phone -- there is inadequate consideration of sustainability by CNSC and the proponent and there is a critical need to examine human health implications on vulnerable populations.

In my time that remains I will attempt to address each in turn.

First, the threshold issue the CNSC must consider in making its licensing decision is whether the licence as drafted is consistent with the *Nuclear Safety and Control Act* and would ensure the adequate protection of

human health and the environment. In our respectful view, this test has not been met, even if we adopt the proposed licence conditions 15.1 and 15.2 proposed by staff.

First, conditions relating to environmental protection cannot be deferred by way of a licence condition. They are expressly matters which must be considered prior to a licence being granted.

Second, proposed licence condition 15.1 sends a message that Environmental Monitoring Programs are not a precondition to licensing. In our view, the public has a right to know and, as the Independent Environmental Monitoring Program will canvass issues of critical importance -- or, my apologies, the Environmental Monitoring Program will canvass issues of critical importance in the community as set out in licence condition 15.1, it should be reviewable in a public forum such as this hearing.

Furthermore, how is the CNSC to anticipate, prevent and attack the causes of environmental harm if the Environmental Monitoring Program which would allow it to do so doesn't yet exist?

For these reasons, we find that conditions 15.1 and 15.2 to be contrary to the precautionary

principle, which is not only a valid principle of international law but a principle adopted by the Supreme Court of Canada into Canadian law.

Moving to our second key finding, we find that there has not been convenient access to information, which is essential to a fair public participation process. As the accountability of decision-makers is enhanced when citizens have access to relevant documents, this is squarely within the jurisdiction of the Commission.

On this slide we list a number of documents we did seek in order to gain a better understanding of the proposal, all of which were denied.

On this basis, CARN submits that BWXT has failed to meet its obligations as set out by the CNSC in its regulatory documents. I will point you to REGDOC-3.2.1, which requires that the public information program and its disclosure protocol by the proponent be commensurate with the public's perception of risk.

Given the high level of concern about the risk accompanying BWXT's licence application to pellet in Peterborough, which is partly rooted in the legacy of illness and contamination left by the GE facility, the Commission must understand that the public interest is

sufficiently high to warrant an open and transparent process for accessing all relevant reports, analyses and data.

I will now turn to the recent Independent Environmental Monitoring Program data as an example to show how the CNSC's public disclosure requirements and protection of human health and the environment have not been met, but ought to have been.

Per section 2.2.4 of REGDOC-3.2.1, there should have been a means in place to ensure open and transparent access to this information when it became evident that there were elevated levels of beryllium in the elementary school.

We recommend that a press release should have been issued bringing attention to the new IEMP data prior to the public hearing and this press release should have described the increases in beryllium and explained potential causes, implications and next steps.

Unfortunately, none of this occurred and because of the conflicting deadlines with the release of this data and intervention deadlines, many intervenors were not able to directly comment on this data.

Moving now to our fourth finding, and

recognizing this isn't directly within the scope of the hearing today, we have heard that socioeconomic impacts are not considered by the Commission. We have also heard that the Commission will not opine on if BWXT has a social licence.

Concerns, however, about siting, intergenerational effects, legacy pollutants are beyond the Commission's jurisdiction. However, they would have been within the Commission's jurisdiction had this project been subject to an *Impact Assessment Act*. And we again reiterate that the CNSC take these comments to the federal government and ensure that a greater number of nuclear projects fall under the project list as set out in the IAA.

Turning now to our expert report written by Dr. Markvart.

Among other things, she reviewed the licensee's licence application and the licensee's Environmental Risk Assessment in detail. What Dr. Markvart found was that the Environmental Risk Assessment and licence application do not devote adequate attention to guiding principles of sustainability, adaptive management and precaution.

I will note that Dr. Markvart is on the

line, so should there be questions for her, she is available to further detail the findings of her report.

Dr. Markvart found that at a minimum BWXT should have acknowledged and incorporated the principles of sustainability, precaution and adaptive management in a systemic way throughout their analysis, and this requirement flows from the CNSC's REGDOC-2.10.1. -- my apologies, 2.9.1. As a result, the CNSC should have required BWXT to provide a detailed explanation of how these guiding principles were considered in their analyses.

Turning to our second expert report and supplemental submission by Dr. Edwards, who is an expert in radionuclides and a professional mathematician, he found that in the event that pelleting got moved to Peterborough from Toronto, in the next 10 years 1,200 school children would be exposed to airborne emissions on a daily basis. As Dr. Edwards notes in his expert report, it is a fundamental principle of radiation protection that no unnecessary exposure be allowed if it can be prevented or avoided.

As Commissioners are mandated to prevent unreasonable risk to Canadians, Peterborough schoolchildren who have not previously been exposed to uranium oxide

particulate matter should not be given this risk in light of the request for a licence before you today.

Dr. Edwards also found that should pelleting occur, airborne emissions of uranium would increase by a factor of approximately 3,000. As this image shows, particulates of uranium dioxide are much smaller than even the finest human hair, measuring less than 2.5 microns in diameter. However, hundreds of billions of these particulates would be emitted every year from the facility should it commence pelleting.

Uranium also gives off alpha particles that travel a very short distance in living tissue. This photograph shows that the tracks made by alpha particles emitted by an alpha-emitting particulate lodged in the lung tissue of an experimental animal irradiating at a tiny region of the lung. A single 1 micron diameter particle of uranium dioxide, given a very large absorbed dose in one year, can have a very significant impact on the volume of the tissue exposed.

As Dr. Edwards concludes, the Commission has a duty to prevent unreasonable risk to the health and safety of Canadians, and it's on this basic principle of radiation protection that he finds the request for a

10-year licence and to bring pelleting to Peterborough is unjust and not supported.

Madam President and Commissioners, we have reviewed all of the nuclear safety laws, regulations, policy documents, we have retained experts and we have undertaken a huge amount of research and it is on this basis that we conclude that the threshold information that the Commission requires to make its decision is not available.

And while responses have been provided by BWXT during the course of this hearing that do shed light on some of the issues, including whether vulnerable populations and human health have been protected and whether precautions have been taken to limit and control emissions to the environment, we remain of the view that the information before the CNSC remains unchanged and insufficient, and on this basis CARN submits that the CNSC deny BWXT's request to pellet in Peterborough and deny their request for a 10-year licence.

Subject to your questions, those are our submissions. Thank you.

THE PRESIDENT: Thank you very much for the presentation.

Dr. Berube...?

MEMBER BERUBE: Well, thank you very much for your presentation and welcome back.

The first thing I wanted to comment on, it's really up to the Commission to determine whether or not there is enough evidence to make a determination on this matter and I think that is pretty clear to everybody in the room. So in that regard, I just wanted to make that clear.

In terms of your presentation, I just want to quickly go back to this model where you are showing this destructive force in the lung and maybe have one of your experts go through their justification for why they are making that determination.

MS BLAISE: Thank you, Commissioner. I would like to turn to Dr. Edwards, who I believe has joined us online.

DR. EDWARDS: Yes. Thank you for the opportunity to comment.

It's important to realize that the International Atomic Energy Agency research and testing, which goes back to the World Health Organization, has pointed out that alpha particles are the carcinogen and it

doesn't matter what the source of the alpha particles are, carcinogenesis occurs as a result of alpha particles bombarding radiosensitive cells.

Now, the range of an alpha particle in tissue, in the case of uranium it is no more than 30 microns, that's micrometres. So if you take a small unit of tissue, 30 micrometres in diameter or in radius, then you can calculate how many joules per kilogram are deposited in that small particle of living tissue.

And it turns out to be for 1 micron particle of natural uranium oxide, it turns out to be about 22 grays. So that's a large dose and that is not converting it to sieverts, it's simply looking at the absorbed radiation dose, which is joules per kilogram. That is certainly more than enough to cause damage to a cell which can trigger a cancer.

Now, it doesn't have to trigger a cancer. In most cases it will not trigger a cancer. However, cancers produced by a low dose are indistinguishable from cancers produced by a high dose, and those cancers are in more than 90 percent of the cases fatal. So we are talking here about a life-and-death issue. Even if the probability is low, the risk is real.

MEMBER BERUBE: Thank you for that.

CNSC, would you care to comment on that particular analysis of the situation?

MS TADROS: Haidy Tadros, for the record.

So I would ask that our specialist in Ottawa on internal dosimetry to provide some detail on that, but I would also ask our human health specialist as well to please stand by to talk about the cancer risk.

So Ottawa, over to you, please.

MR. THÉRIAULT: Bertrand Thériault, for the record. I am a Dosimetry Specialist with the CNSC.

So yes, in fact, the U-238, -234, -235 are alpha emitting. Their range is in fact about 30 to 35,000th of a millimetre. So in order to assess the risk, the dose is used as a measure of the risk and it's the amount of energy absorbed per kilo of absorbing tissue, so joules per kilo. So of course if we divide the energy absorbed from a single alpha particle divided by the range of 30 or 35 microns, we divide by a very small number, so we get a very large result.

To assess the risk, the approach recommended by the ICRP is to assess the risk not from a single alpha particle but all alpha particles released over

time in an organ or a tissue. So the approach is to calculate the risk to not a small volume but the entire organ, which is the approach used in the calculation of worker or public dose from inhaled UO₂.

MS TADROS: Haidy Tadros, for the record.

So perhaps our human health scientist can shed some light on the cancer rates at low dose.

MS RANDHAWA: Kristi Randhawa, Radiation and Health Sciences Officer, for the record.

So when we take into consideration public dose from this facility, that incorporates internal alpha emitters and from what we know from the scientific evidence is we do not necessarily have direct evidence of an increase in the likelihood of adverse events over -- or, sorry, under 100 mSv.

As Dr. Gordon Edwards said, there may be a chance that there is an increased likelihood of adverse events under 100 mSv, but it is very difficult to distinguish that from background radiation.

However, when we look at the dose from these facilities, it is well below the dose of the public dose limit, well below the dose where we know -- where we have seen health effects. And in terms of exposure from

uranium, from the evidence we have seen no health effects other than alterations on kidney function that have been found in human populations.

So when you take into consideration the dose and how much of a dose you would need in order to potentially see cancer effects, we haven't seen that in human populations yet.

THE PRESIDENT: Dr. Lacroix...?

DR. EDWARDS: May I comment, please?

THE PRESIDENT: We will get to you at the end, Dr. Edwards.

DR. EDWARDS: Thank you.

DR. LACROIX: Thank you. Thank you for your presentation.

Still on this subject, staff, have you checked and cross-checked and validated the calculation of the absorbed doses that are reported in Table 4 of Dr. Edwards' report on page 21?

MS TADROS: Haidy Tadros, for the record.

I would ask our internal dosimetry specialist in Ottawa to verify that question.

MR. THÉRIAULT: Bertrand Thériault, for the record, again.

Yes. So we did calculate the dose from a 1 micron diameter particle. We calculated in terms of the dose to the organ or the effective dose and came out to, for one particle, about a millionth of a microsievert, which is basically to determine the amount of UO₂ that has to be inhaled to have one particle and the overall 50 or committed dose to the entire body.

But for the single particle I don't have the exact numbers with me, but we would get of course a high number. I can't confirm whether it is 22 grays, but it would certainly be higher than the dose to the organ.

MEMBER LACROIX: The purpose of my question is that I want to make sense of these numbers reported by Dr. Edwards' report. I want to get a sense, a feeling of what these numbers mean when he reports the absorbed dose in terms of milligrays and you guys at CNSC, you report it in terms of millisieverts.

MS TADROS: Haidy Tadros, for the record.

So I will again pass it to our internal dosimetry specialist in terms of the weighting factors that are used per organ and also the factors that are used to compare different atoms of radiation, alpha, beta and gamma.

So Bert, over to you, please.

MR. THÉRIAULT: Bertrand Thériault, for the record.

So, right, there are several different types of quantities referring to dose. The absorbed dose is simply the amount of energy absorbed per mass of tissue or absorbing material. So these are joules per kilo. It's a physical quantity, but it is not an accurate measurement of the actual risk to health.

In order to have a sense of what is the risk, the equivalent dose is calculated, which is the absorbed dose multiplied by a radiation weighting factor, which is a number which is representative of the biological effectiveness of different types of radiation at low doses and dose rates for cancer induction in humans.

So for alpha particles the factor is 20, which means that a dose of, say, 1 gray of alpha particle will produce the same biological effect in tissue as a dose of 20 grays from X-rays for instance, which has a radiation weighting factor of one.

So when calculating the dose, then the dose to each organ and tissue is calculated considering the radiation weighting factor of each type of radiation

emitted, and once the organ equivalent dose is calculated, then the effective dose is calculated by multiplying each organ equivalent dose by their respective tissue weighting factor, which is a number that -- which is a weighting factor that is representative of the susceptibility of cancer induction in each of the various tissues and organs.

So for instance, for the lung the tissue weighting factor is 12 percent compared to the thyroid which is 5 percent. So in that sense, these are summed to get a single quantity, the effective dose which is a measure of the risk of cancer induction in humans at low doses and dose rates.

THE PRESIDENT: Dr. McKinnon...?

DR. MCKINNON: Yes, thank you.

I would like to follow up on the question you had about the monitoring program. And yesterday we spent quite a lot of time discussing the soil sampling and especially the measurements at the nearby school.

But it raised another general question which I have for CNSC staff in terms of measuring contaminants that get into the local environment. The focus has been entirely on soil sampling. And it occurred to me that with some of the other discussion that there may

be other places that the contaminants accumulate. And around a school there are hard surfaces, asphalt, where children play also. And things could get flushed into certain areas and concentrate.

So my question would be is there evidence to suggest that soil is the primary place that in this case the beryllium would concentrate and provide exposure? Or are there other places that it could be? Because this would guide the methodology of the sampling program.

MS TADROS: Haidy Tadros, for the record.

So perhaps I'd ask both Mr. Rinker to give an explanation of sort of how we look at the dispersion models of these kinds of chemicals, and then perhaps I'd ask Ms. Kiza Sauv e to give an appreciation for how the sampling is done based on some of the models that we see.

MR. McALLISTER: Andrew McAllister, director in the Environmental Risk Assessment Division.

I'll speak to your first point, Dr. McKinnon, about areas where things might potentially accumulate and such.

The advantage I guess of soil is that when things deposit on it, you will get processes that will -- sometimes you will get processes that will -- such as

overland flow which will move the particles, but more often than not, it gets mixed into the top level of the sort of five centimetres of soil.

But when we talk about things like hard surfaces and those aspects, we look at so how are those affected and what sort of processes are at play. With hard surfaces, we see -- tends to point us towards stormwater and how is stormwater dealt with in that respect.

That was looked at in the environmental risk assessments that were done by BWXT, both individually and then they looked at things consolidated. Because one of the things in an environmental risk assessment when you're developing your conceptual site model is what are the potential pathways for contaminants.

What BWXT did for both uranium and beryllium in a consolidated way is took the maximum recordable annual amount of uranium and beryllium that has gone through the stack and basically deposited it within a certain radius of the facility and assumed that it was all in the stormwater, and then did some other calculations -- these are detailed in the risk assessment -- to see what sort of concentrations we were talking about.

The results that they found for uranium

was 0.007 parts per billion, I believe, and beryllium likewise was a very low number, both those numbers being well below guidelines that are protective for human health and the environment. And as such, they didn't pursue that pathway further.

So that's to give you a bit of appreciation of how those were dealt with.

THE PRESIDENT: Okay, thank you.

Dr. Demeter?

MEMBER DEMETER: Thank you for the presentation.

We've partially discussed this before, but I think it's good, I'll ask BWXT in the intervenor's document that talks about concerns for radon and polonium. And we had a lot of discussion about the presence or absence of radon. But maybe you could clear up -- they are part of the decay chain -- why they are or aren't an issue with the particular form of uranium you're dealing with.

MR. CHAMBERS: Doug Chambers, for the record.

It was well discussed a few days ago, but in brief, the raw material comes from a mine. It goes for a first step of purification at the mine site, and the

product that leaves the mine site is very pure. It's refined further by Cameco in Port Hope, and the uranium dioxide that's received in Peterborough and in Toronto is basically pure uranium, containing uranium-238, -234, and natural quantities of uranium-235.

And over time, the intermediates between uranium-238 and -234 grow in. But the bottom line, there's a natural break of 80,000 years or so between uranium-234 and other radionuclides of potential interest. And that comes from the half life of thorium-230.

So basically in the materials that BWXT handles, there is no radium, and hence there is no radon. And similarly, polonium comes after radium, and if there is no radium, there is no polonium.

And I think that's the simplest answer.
Thank you.

MEMBER DEMETER: So I just want to summarize so that I understand that the decay rate to get to the thorium is so long, that the product you have never gets to radon or polonium?

MR. CHAMBERS: That's correct.

MEMBER DEMETER: In any significant --
okay.

MR. CHAMBERS: Doug Chambers, for the record.

That's correct, sir, 80,000 years. And I would suggest that BWXT doesn't want to have an inventory of uranium on site for 80,000 years.

MEMBER DEMETER: Thank you.

MR. CHAMBERS: Thank you.

THE PRESIDENT: Before I turn to you, Dr. Edwards, a question for BWXT: On slide 7 of the intervenor's submission where they list a number of documents that they were denied access to, I understand some may be for proprietary reasons, some just from their titles I don't know why they would not have been disclosed. And Mr. MacQuarrie, I know in Toronto you spoke at some length on this. Can you comment on these specific documents and how access can be better provided?

MR. MacQUARRIE: It's John MacQuarrie, for the record.

So yes, some of those documents, for example the business plan, we would view as proprietary. I'm not sure why it would be needed to be shared. But in terms of the other documents, we have moved to have summaries of a number of those on our website recently.

And as I said in Toronto, we're moving to increase transparency and provide either the entire document or summaries so that we can meet the expectations of these intervenors.

THE PRESIDENT: Thank you.

Mr. Jammal, did you have something you wanted to add?

MR. JAMMAL: Thank you, Madam President.

It's not related to this question, but I would like to give clarity with respect to Mr. McAllister's answer for Dr. McKinnon with respect to beryllium.

We gave you a description of one input and outcome of the environmental risk assessment for beryllium and how it's being modelled with respect to potential exposures or releases.

I would like to contribute to the fact that beryllium is a by-product from fossil burning. So I'm not taking away the fact we are going to look at the beryllium itself, but if you're burning fossil, it'll be from gasoline refining, vehicles, everything else. These are contributors to the ambient beryllium that is in the environment.

So again, I want to reiterate the fact my

comment is to give a fact that beryllium presence in the environment could be other contributors, but we're not stopping and accepting it. So we're going to continue the assessment and investigation for the beryllium to make sure that we've covered all aspects of it contributing to the beryllium increase.

MEMBER MCKINNON: Okay, so if it is other sources, you would be establishing general background levels and then comparing those to the local readings?

MR. JAMMAL: Ramzi Jammal, for the record. That's correct. I will pass on to Mr. McAllister if he has anything else to add.

MR. McALLISTER: The only thing I would add to revisit a point that I made yesterday referring to background. It will have -- and I believe the Ministry of Environment and Conservation and Parks can also complement the answer -- but when we're looking at points of comparison, whether it be background or guidelines, it's not the CNSC's -- in the case of a hazardous substance, it's not the CNSC's guidelines, it's those established by provincial or federal authorities.

In the case of background, we look to the Ministry of Environment's soil standards for background

that they have established. And the means by which they've established them is they've looked at background levels in areas not impacted by point sources and developed backgrounds used a value representing sort of an upper limit of background.

And so that's the points that we've seen here, that that background is similar for both uranium and beryllium and is the ones that we use when, you know, situating the concentrations that we found in the independent environmental monitoring program relative to other aspects.

THE PRESIDENT: So maybe now is a good time to see if we've got folks from the Ministry of the Environment, Conservation and Parks on the line and get their perspective on this.

MS CHISHOLM: Good morning, thank you. My name is Cathy Chisholm, and I'm representing the Ministry of the Environment, Conservation and Parks.

With me on the phone and available to answer your questions are my colleagues Ross Kircher, air scientist; Jamie Mugford, issues project coordinator; Mark Phillips, surface water scientist; Nancy Orpana, air engineer; and Kyle Stephenson, a hydrogeologist.

And in response to your question about the beryllium in soils, I'm going to call on Jamie Mugford for a response.

MR. MUGFORD: Good morning, Commission Members.

So this was an interesting point of analysis, the soils beryllium data. And we did see an apparent increase between the three years of sampling. And so we did discuss -- we reviewed this internally with our technical people, Kyle, a professional geoscientist and engineer. And then we discussed it with CNSC as to what some potential causes. It didn't look really natural, these changes.

And so they described that there were some changes in the sampling methodology and there were some changes in the analytical methodology. And when you put those factors together, it seems that they could account for the changes we've seen. And when you also consider natural background natural background variability of soils, soil sampling itself, you put that all together, and then you also consider that air monitoring data shows essentially very negligible amounts coming out, and then you also consider the highest increase was at the school,

which is actually in the upwind direction where you would expect to see the lowest, and then you also consider the facility's been operating for 50 years and we're still seeing very low background numbers. So you put that all together and it doesn't look like this is reflecting actual emissions.

The future soil sampling will help to confirm these points, but it does not seem that these numbers are reflecting actual outputs to us.

Kyle Stephenson, our professional geoscientist, he could clarify and add to that, if you would like.

THE PRESIDENT: No, I think that is good.

Do you see much fluctuation in the background levels? How often do you sample, anyway, for that? And does it vary a lot from year to year?

MR. MUGFORD: Those background numbers are there, they've been determined statistically from sampling all across Ontario. They represent an Ontario background range.

The CNSC, they could speak best about their background sampling in this program, the IEMP program. I believe they have some background locations.

They're showing one that, you know, that compares.

But the background number that we're using, that's like a background typical Ontario range. And the samples, the results we're seeing, they're all within that range and they're all just slight variations of very low and within the background range. So that's our opinion.

THE PRESIDENT: So I think from what I'm hearing from you is that you're at a loss as to why at the Prince of Wales School the results are high.

And so for CNSC staff, if -- not if -- when you do your resampling and you get high results again to confirm that this is indeed a real level of contamination, what would be your next steps?

MS SAUVÉ: Kiza Sauvé, for the record. I'm the director of Health Science and Environmental Compliance Division.

Something I want to make sure that we're saying is the numbers aren't high. Okay? The children at the school are safe. I'm a mother as well, and if I was seeing these results and comparing them to the guidelines and the screening levels that are out there, my children, if they went to that school, are safe. So I want to make

sure that that's clear. The numbers are not high; they're within typical background range.

When we go back and sample this year, we will be comparing looking at those numbers as well. And we'll have to make a judgment call, a professional judgment call as to what would be done next, just like we do with any IEMP program should we get results back.

In terms of when we publish those results, we do put them on the website. We'll do a push-out when we get our results. In this case, we've added something to the IEMP website to talk about our next steps, which would be to resample and to look again. And like any IEMP program, if we see results that show that the public was at risk, we would take immediate action.

We have not seen results that show the public's at risk.

THE PRESIDENT: So what I've heard is the reason why these may be high is because you've changed the sampling, the analytical methodology, but it's not been consistent with the other sites. And in fact, given that this is upwind of the facility, that that's even more puzzling.

And as we've seen from the interventions,

I mean, this causes a lot of, understandably, anxiety and is this a trend and maybe they're fugitive emissions that we're not aware of.

I'm just wondering, do you think of what the outcome may be of your next sampling and monitoring results? And if it's just going to raise more questions, we should try to anticipate how we're going to address those.

MR. RINKER: Mike Rinker, for the record.

So that's a very good point. While we're explaining we don't anticipate tying this back to the facility, we have to be prepared for what if we see something that remains unusual. And the pathway, of course, is if it was from the facility, it's through air emissions, whether they're from stack emissions or they could be fugitive emissions, which are not through the stack. And in both cases, the way to monitor for that is to be monitoring for ambient air concentrations.

And so if we were to see a continuing trend in soil or unusually high numbers in the school that are not observed elsewhere, we would put in place a requirement to do further monitoring to narrow down where would be the cause, whether it's BWXT or if there's other

sources. That needs to be pinpointed and we would act upon that.

THE PRESIDENT: Thank you.

Dr. Edwards, over to you on the health implications and the responses you heard to some of the questions of the Commission Members.

DR. EDWARDS: Thank you very much, Madam Chairman.

Yes, as you can hear from the responses, there's a lot of guesswork involved in trying to estimate what is the biological effect of a certain dose of alpha radiation to the lungs. And that's because it's very difficult to measure. Once an alpha emitter is inside the body, you can't really measure it from outside the body.

Now, the World Health Organization, consisting of health professionals -- which is not the case with CNSC staff; it's not dominated by health professionals even though health, protecting health is one of the Commission's main jobs -- but they say that

"all radionuclides that emit alpha particles ..."

-- I'm quoting --

"... have been shown to cause cancer

in humans and in experimental animals." (as read)

Now, a cancer is the same whether it's caused by a low dose or a high dose. And as a result of this, one of the basic principles of radiation protection is that no radiation exposure should be allowed without justification. Justification comes first; dose limitation comes second; and ALARA, as low as reasonably achievable, comes third.

Six months ago an IAEA team of 24 experts from 17 countries visited Canada from the 3rd to the 13th of September 2019 for 10 days. Their number one recommendation was that CNSC begin to respect the need for justification of any radiation exposure. This is something which is currently being overlooked by the staff in this case. Dose limitation is no substitute for justification.

Your staff has been told that there will no risk to these children. That's wrong. It is unscientific. When it comes to cancer, as I said, low risk is not the same as no risk.

We have in 2017 had a European study of 553 dead workers showing that uranium dust does cause excess lung cancer. This study was supervised by the woman

who ran the radiation division of the IARC of the World Health Organization up until 2008.

So I think that we have to realize that there are hundreds of young children at Prince of Wales Elementary School that need your protection, Commissioners. The Commissioners' job is to prevent unreasonable risk to Canadians.

The youngest -- they are four to 14 years of age, and the youngest ones will be attending that school for eight or nine years. Is it reasonable that they should be inhaling radioactive particulates into their lungs, where it will stay for a long time, on a weekly basis? I don't believe it is, and I don't think there's justification to warrant that.

Justification has been enshrined in the law in Germany. It's part of the actual law. And here in Canada, the IAEA mission that was here in September recommended that Canada follow suit and enshrine the need for justification of radiation exposure in the law. So I would ask the Commissioners to please take this to heart and realize that any risk of a fatal lung cancer that is avoidable should be avoided.

Is it really necessary for pelleting to

take place in Peterborough? There's been no reason given for that. Is there any benefit to the people exposed or to society at large for pelleting to take place in Peterborough? There's been no reason given for that. Consequently, there has been no study of the justification at all. And I believe that this makes it impossible in conscience for the Commissioners to approve pelleting on the basis that it is simply gratifying the wish of the licensee and not following their mandate to protect Canadians.

THE PRESIDENT: Thank you, Dr. Edwards.

Before I turn to you, Dr. Demeter, staff, can you comment on Dr. Edwards' comment around the IRS IAEA's review and a recommendation that Canada revises its law around justification of any dose?

MS TADROS: Haidy Tadros, for the record.

I will pass this question to Mr. Ramzi Jammal.

MR. JAMMAL: It's Ramzi Jammal, for the record.

The IRRS mission provided a suggestion. So in other words, the suggestion and a recommendation under the IRRS review are classified according to the

following. A suggestion, that means you are not -- not you are -- the member state that's being reviewed is in line with the safety standard of the IAEA. A suggestion means to provide clarity. So we have published the CNSC response to the IRRS mission.

But Dr. Edwards presents the fact justification. The justification, the safety fundamental principle itself, it says for facilities and activities to be considered justified, the benefits that they yield must outweigh the radiation risks to which they give rise. That is the safety fundamental.

In Canada, CNSC achieves this through the licensing regime and the regulation and promulgation of regulations. So we have regulatory documents, we have regulations. So before any activity is authorized, the Commission -- doesn't matter if it's for an operation or a possession -- the Commission is empowered by Parliament in order to address under the *Nuclear Safety and Control Act* the risk associated with it and the mandate of the Commission with respect to the health and safety of persons.

So in other words, the justification is taken into consideration into the determination with

respect to the risk of the facility and the associated activity by which the Commission approves via a licence.

So section 24 of the Act literally talks about the qualification "unreasonable risk," and that's why we are providing you with our recommendation with respect to the negligible risk that exists; as a matter of fact, no risk.

In addition to the 24(4) section of the Act, we do our own environmental determination and, under the *Canadian Environmental Assessment Act*, which was implemented 2012, is it's been determined that the purpose and -- of and the need of the designated project and then was alternative means being carried out and any alternative of the designated project that are technically economically feasible that are directly related to the designated project.

So in other words, everything has been assessed and determined based on unreasonable risk being imposed on the public, workers and the environment.

So justification is embedded in law. Even though the wording does not exist in the Act as such, but it's embedded in law via many sections of the Act.

THE PRESIDENT: Thank you.

Dr. Demeter.

MEMBER DEMETER: Thank you.

I wanted to stick with the health theme and sort of maybe help -- maybe our internal dosimetry at CNSC can help me with understanding something.

So our whole scheme of risk to humans from radiation is based on absorbed dose equivalent dose which takes into account radiation rating factors and effective dose which also takes into account distribution to different organs that have different susceptibilities.

That's been -- and based on that, all the risk calculations that have dose per -- risk per meter of dose have been based on. And Dr. Edwards presented data on dose in a very, very small micro environment cell to cells, which is called micro dosimetry.

And from my understanding, micro dosimetry has its uses for radiation therapy planning and very specific uses, but I have not seen it used for risk assessment in humans.

The risk assessment in humans is effective dose, which is radiation weighted factors, tissue weighting factors, and that's how we face all our risk perceptions.

So maybe the internal dosimetrist can help

me understand if this is an apples -- I think this is an apples and oranges comparison, and maybe they can help determine if that's a reasonable observation.

MR. THÉRIAULT: Bertrand Thériault, for the record.

So yes, in fact, the concept of effective dose has been developed and recommended by the ICRP since the late 1970s. Before that and as we could see in the Atomic Energy Control Regulations going back to that time or before, there wasn't dose limits based on effective dose. Rather, they were separate dose limits for different organs, so there was a dose limit for dose to the lung, dose limit for dose to the thyroid and so on and for the whole body.

And you could get dose close to the limit to the lung, but very low for the whole body, for instance, so -- but the concept of the effective dose first published in ICRP Publication 26, 1977, it -- the idea was to capture the risk to health of cancer induction in persons into one number, into one metric.

And this is the quantity that's been used ever since. And even in their latest recommendations, ICRP Publication 103 published in 2007, the concept of effective

dose is still used and it's recommended by the IAE in their basic safety standards 2014 and worldwide it is used as the metric and dose limit as a risk to humans and dose limits throughout the world are expressed in terms of the effective dose.

MEMBER DEMETER: Thank you.

DR. EDWARDS: I'd like to comment on that.

THE PRESIDENT: Dr. Edwards?

DR. EDWARDS: Can you hear me?

THE PRESIDENT: Yes, we can.

DR. EDWARDS: Can you hear me?

THE PRESIDENT: Yeah.

DR. EDWARDS: Okay, thank you.

Yes. I just wanted to say that Ramzi Jammal did not really quote the full principle 4.

Principle 4 of the IAEA, the International Atomic Energy Agency, is the one that is singled out as something that they may a suggestion to the Government of Canada that this should be enshrined in law. Principle 4 says -- this is from their own safety document, the IAEA safety document.

Principle 4 says justification of facilities and activities. Facilities and activities that

give rise to radiation risk must yield an overall benefit and the justification must take into account both the risks and the benefits.

Now, there has been no discussion of benefits. There are no benefits to the children, for sure, for being exposed to this radiation in salt, and there's no discussion of benefit to society. So it's really just to benefit the licensee.

Now, that is part of justification. Justification is not having to do with satisfying the licensee; it has to do with benefits to society or to the people being exposed by radiation.

That precedes any discussion of dose limitation. Dose limitation is only considered and meeting standards and as low as reasonably achievable. These come after justification.

And what the submission from the IAEA pointed out is that Canada has not been doing this.

The CNSC -- it is not enshrined in the CNSC Regulations. They simply think that if the Regulations are met that everything is fine.

Well, that's ignoring the fact that you need to justify the exposure to begin with, and that has

not been done.

THE PRESIDENT: Okay, thank you for that.

Any further questions?

Ms Blaise, final word for you, 30 seconds, please.

MS BLAISE: Thank you, Madam President and Members of the Commission.

I would just like to close by reiterating the significance of the decision the Commission has before it today. This is no insignificant issue, and it will affect the lives of CARN and also individuals living in Peterborough.

There's a few issues that have arisen over the course of questioning that I would just like to turn to.

First, should the CNSC choose to grant a 10-year licence, it will be doing so despite deficiencies in the material. And while recognizing that it is a matter before the Commission to determine if the information is sufficient, we ask that in the written record of decision conclusions that are reached are substantiated, verifiable through thorough analysis and review.

However, even if that is conducted by the

Commission in their written record of decision, the issue remains that the documents the Commission Members have access to is not the same documents that we as intervenors and the public have access to.

So while BWXT has remarked they don't know why we want access to these documents, which include their quality assurance program and their preliminary decommissioning plan, there's no way for the public to independently verify what is being said about these documents in the Commission's decision without access to these documents.

We also ask that the Commission exercise their jurisdiction and discretion in a way that upholds natural justice and procedural fairness, as currently CARN and the citizens of Peterborough who stand to be most affected do not have an open and transparent evidentiary record.

As our expert, Dr. Markvart, found, the environmental risk assessment is insufficiently narrow and does not sufficiently respond to the widespread public concerns about the long-term cumulative effects and its associated costs on future generations.

As Dr. Edwards has continued to reiterate,

there is a critical need for ongoing health study and to consider the implications should this change to the licence be granted for Peterborough.

It isn't good enough to say improvements will be made to public awareness and that improvements will be made to environmental monitoring and sampling. Commitments, unfortunately, are not binding and we must have these within the licence and Licence Conditions Handbook.

And it is our submission that BWXT has not demonstrated why, in the circumstances, it should be granted a 10-year licence and the flexibility to pellet in Peterborough, and our position remains unchanged and we would reiterate that the licence be denied and the request to conduct uranium pelleting in Peterborough not be permitted.

Thank you, Members of the Commission.

THE PRESIDENT: Thank you for your submission.

The next presentation is by Ms Jenny Carter as outlined in CMD 20-H2.29.

Ms Carter, the floor is yours.

CMD 20-H2.29

Oral presentation by Jenny Carter

MS CARTER: Thank you for giving me this opportunity.

I do not trust the assurances that we are given about the safety of the BWXT plant in Peterborough, especially if pelleting comes.

I'll give examples of why I feel this way, and I assure you that they are relevant.

These hearings include the Toronto plant, which already produces pellets. For years, they hid from the public around them. They have had problems with the emergency plans and do not seem to have acted on recommendations for increased safety.

When a member of the public asked what happens in an accident there, the answer was, "Well, there won't be".

There is no basis for trust in our twinned plant.

I have a book called "Nuclear Family" by Joanne Young. Ms Young's husband worked at Eldorado Nuclear in Port Hope. He started there in 1952, and by

1956 he was dead of a rare cancer after realizing that he had been exposed to excess radiation.

A claim against Eldorado for the death of Bill Young was rejected, as were all such claims made to Eldorado. Joanne was left to struggle financially to raise her four children.

Later, when she joined demonstrations against nuclear energy, she was thrown into jail, manhandled and fired from her job as a teacher. She ended up unemployed and with a criminal record.

In 1984 she demonstrated against the construction of the Darlington nuclear plant, and was manhandled and jailed again.

Port Hope is, despite past clean-up efforts, now thoroughly polluted, although we hear very little about it. I do not know whether there has been any monitoring of health effects.

The CNSC information on Port Hope states that there has been nuclear contamination from Cameco, but it's completely bland, making no mention of the deaths that have happened there or the school that had to be closed or the public outcries that had to be suppressed.

I see that Cameco has been in trouble

recently over excessive discharges of uranium and uranium hexafluoride into sanitary sewers. In their report for the second quarter of 2017, they deliberately concealed a massive illegal increase in such discharges.

A similar plant in Ohio now being turned into a nuclear waste dump has led to the closure of a school because of nuclear contamination. BWXT is a defendant in the resulting court case.

Then there is Peterborough itself. A lot has already happened in that building.

GE was Peterborough's pride and joy until people started dying, but when claim after claim for compensation for sickness was turned down, it became clear that the Worker Safety Insurance Board did not care about the well-being of workers.

Workers in the nuclear division wore badges to record radiation exposure. At least once, they deliberately exposed the badges to see what would happen when they were turned in and tested. Nothing happened. They were returned without comment.

The severity of the 2010 accident at Shield Source in Peterborough, which released 30 percent of its legal daily limit for tritium in five minutes, was

grossly under-reported by CNSC Staff.

Most conclusively, I want to refer to the Three Mile Island accident of March 1979. Officially, it caused no deaths, and yet over 2,000 lawsuits were filed, mostly due to cancer and birth defects in the surrounding area. Cattle died, eggs would not hatch, and the neonatal deaths spiked in Pittsburgh and elsewhere.

The movie "The China Syndrome", which appeared at the same time, provided an oddly accurate commentary.

For three years, the development of nuclear power in the U.S. was halted, but it began to come back in 2007.

There have been many, many nuclear accidents about which we hear little, and there is a long history of those who complained of shortcomings not being listened to. They were punished instead.

There are many other reasons not to trust the nuclear power industry.

Since sickness and death can occur decades after exposure to radiation or in unexpected geographical locations, the connection to radiation damage is not made. Thousands of unborn babies have died in the womb or been

grossly damaged.

In total, there must have been millions of deaths, but since statistics have been unreliable or non-existent, nothing can be proved.

Background radiation has increased. This is being caused by nuclear tests which did not go underground until 1963, by extensive lists of accidents, by nuclear tipped shells used by the U.S.A. in warfare, by nuclear waste, which cannot be safely stored, and by routine emissions.

This must have already caused a worldwide increase in cancers, hereditary defects and premature aging, but documentation is missing.

Had statistics been recorded, we would know whether being a student at Prince of Wales School has had any effect on subsequent health or whether Wharf Street and Albert Street have had more than their share of cancers. To even consider siting pelleting opposite that school is appalling.

It is significant that the insurance industry will have nothing to do with nuclear energy. They know the damage can be astronomical.

Nuclear energy is expensive and becoming

more so, which is why the government of Ontario is subsidizing our hydro bills with taxpayers' money.

Nuclear energy is unsafe in many ways. Extreme weather from climate change and changes in water levels and temperatures could trigger accidents. Nuclear energy demands perfect in those who construct its buildings and in those who operate them, which is impossible.

In the event of terrorism or war, these installations could be a powerful weapon against the public if, heaven forbid, times change and we cease to have the orderly, peaceful society we are accustomed to or to have the trained personnel necessary to run these installations, there would be disaster.

Even now, there could be an accident which would make the city uninhabitable. Evacuation would be the first need, but where would people go?

So why do we have nuclear energy? The real answer lies in money and with the military.

We do not seem to realize that a nuclear war would destroy us all. Nuclear energy is a great profit maker for large companies, many of whom supply the U.S. military with substances such as plutonium and tritium which are required for the maintenance of nuclear weapons.

By filling in the electricity grid, nuclear energy is blocking Ontario's development of cheaper, safer renewable energy which would provide far more jobs, with conservation, is a real answer to climate change.

It seems that Admiral Rickover, father of America's nuclear navy and the pressurized water reactor, made a confession to his daughter-in-law. He had used his personal influence with President Jimmy Carter, he said, to suppress the most alarming aspects of the Presidential Permission Report into Three Mile Island and, instead, release it in a watered-down form. The report if published in its entirety would have destroyed America's civilian nuclear power industry because the accident at Three Mile Island was infinitely more dangerous than was ever made public.

But there is worse. In 1959, the International Atomic Energy Association and the World Health Organization made an agreement to simply discourage research into the health effects of nuclear radiation. This is why health agencies can say that there is no research saying that exposure to nuclear radiation is bad for our health.

Standard risk models underestimate the health impacts of low levels of internal radiation by between 100 and 1,000 times. I repeat, between 100 and 1,000 times.

We value our children. We do not want you pelleting in Peterborough. We do not want this licence renewed.

Thank you.

THE PRESIDENT: Thank you very much for your intervention.

Dr. Lacroix.

MEMBER LACROIX: Thank you very much, Mme Carter, for this presentation.

I must say that among all the submissions that I've read in preparation for this hearing, yours was one of the most interesting, the most fascinating in the sense that you have a way of blending your own story with history, so thank you for this submission.

And I would like also to say one thing.

I strongly disagree on one point only concerning your written submission, and it is when you say "I'm very old". You shouldn't say that. You're very wise. You're experienced.

You have not grown old; you have grown up.
So thank you very much for your
submission, and rest assured that we will address your
concerns.

THE PRESIDENT: Dr. McKinnon.

MEMBER MCKINNON: Thank you for your
historical overview. I think it's very important that we
not forget the past and we learn lessons from that.

One point I was alarmed to hear about your
story that people took their dosimeters and exposed them
and submitted them to see what would be the response, so
that brings my question to the company.

If you could just explain your control
systems internally over the use of dosimeters, if any
issues could be -- like people taking them out of the plant
or exposing them like that, is there any possibility, and
how you respond to the readings.

MR. SNOPEK: Dave Snopek, for the record.

At both of our plants, our employees that
are designated as nuclear energy workers wear TLD badges or
radiation monitors on them at all times while they're in
the work area.

Those TLDs are picked up in the morning at

a badge rack, so it's a specified location where workers when they're not at work store the badges in the rack. When they get to work, they pick them up and they wear them, and there are certain requirements about where they wear them on their body, between the belt and the chest.

We have surveys that we do when we go through the facility to ensure that people are, in fact, wearing their badges, they're wearing them appropriately and they're storing them appropriately.

There is potential that badges are left in lab coats, for example, and in that case a lab coat left overnight or over the weekend may pick up dose. That is not representative of the worker being there.

So we have tight controls over the storage of those badges.

Additionally, we send these out for counting, so the way this works is you wear a badge for a period of time, the badge gets sent out to a third party for counting to determine the dose that was incurred in that period of time.

In Toronto, that interval is monthly. In Peterborough, that interval is quarterly.

When those results come back, they're all

reviewed. They are reviewed by our EHS staff and they are compared against internal control levels and action levels.

They're also looked at generally in terms of unusual readings. But most importantly, they're compared against our internal control levels.

And if we see anything that exceeds an internal control level, it prompts investigation and -- to determine the nature of the cause. Was the badge stored appropriately? Was there -- was this basically a real exposure that caused an exceedance of the internal control level or was it something like a badge left in a lab coat in an area inappropriately?

So the investigation is conducted and then it's determined is this a real dose, is it not. If it's a real dose, then we look at what's the cause of that and can we take steps to ensure that that's controlled and those doses are brought back down?

I will mention that internal control levels are levels that are set very low. They are lower than action levels and they are lower than regulatory levels. So the intention of these internal control levels is to identify small upsets so that we can intervene and determine the cause and take corrective action early.

THE PRESIDENT: Dr. Demeter.

MEMBER DEMETER: Thank you for your intervention. I will follow up when we have Emergency Response and the Public Health people here with some of the questions you have so I can get the information, but no other questions at this time.

THE PRESIDENT: Dr. Berube.

MEMBER BERUBE: Yes, I just want to follow up a bit on the dosage of your employees, some of the things that I've come to understand.

I believe it's true that the majority of the dose to your employees is gamma. Is that correct?

And you have a full characterization, I guess, of your processes in both facilities as to where the gamma sources are and take precautions about that?

And finally on that, you are using mobile gamma detectors to quantify and monitor these things on a regular basis? Is that also true? And how do you do that?

MR. SNOPEK: Dave Snopek, for the record.

That's correct. The primary external dose hazard is gamma radiation. The gamma comes from stored material, comes from product. It is well understood where that material is.

The gamma dose rates in the facility are low. They are measured routinely and they are measured by radiation detection instruments. So we survey the facility on a periodic basis to ensure that the doses remain low, that there has not been an accumulation of material that is leading to a dose that's unusual.

In both of our facilities there are no areas in the facility where there is a danger of acute dose, where you could get a high dose over a short period of time, as is the case in other facilities. That doesn't exist in our facilities. We have very low dose rates that don't change over time because we have areas where we store material, we have areas where we work with materials.

So those dose rates are fairly consistent, but we do monitor them.

Most importantly every year we have objectives in terms of ALARA projects, or as low as reasonably achievable projects, where we put in place a handful of projects that look to reduce the dose in those areas that are our highest dose in terms of not just necessarily the dose but the dose and the occupancy.

So if we have areas where people are working six, seven, eight hours a day, then we're going to

want to look at those areas to make sure is there a rearrangement of that area we could do so that material they're not directly working on isn't immediately beside them, for example?

Where that's not possible, can we introduce shielding so that the gamma dose from that material is shielded?

MEMBER BERUBE: Just one other question with regard to gamma. Do you actually carry DRDs or just TLDs all the time?

MR. SNOPEK: Dave Snopek, for the record.

We carry TLDs. We don't carry direct reading dosimeters, and the reason for that is we don't have that very high radiation zones that are changing in time and space very quickly. They are very consistent. They are very low. It's mostly an ALARA type of issue where we're trying to drive those further lower still. But there are no acute radiation hazard zones in our facilities.

THE PRESIDENT: We've spoken mostly about your fuel processing side of the business. Your service side of the business, do you get highly contaminated equipment to work on?

MR. SNOPEK: Dave Snopek, for the record.

No, we do not. Typically what we would get back under what we call our fuel handling side of the business, we would get parts from a reactor site, for example, that can't quite be cleaned down to free release. They typically are cleaned so bulk materials typically aren't present on the part. But there is either a potential that there's radiation above the limits for free release from the reactor site or known contamination on the part, but at low levels.

So typically these are parts that maybe when they're disassembled we're exposing surfaces that just can't be cleaned, that might be contaminated, but it's low levels of contamination.

Also dose rates from the part are very low or even zero. It's mostly contamination that's on the part.

THE PRESIDENT: Thank you.

Thank you for your submission. Do you have any final words you wanted to make, Ms Carter?

MS CARTER: I would just like to say there is no safe dose of radiation, zero. We've always had background radiation and there have always been some

cancers, but Rosalie Bertell was working to find out why there had been a rise in cancers and such in certain parts of the U.S. and she discovered that the rise was due to medical radiation, x-rays and so on. So even a small thing like that produced more cancers.

It's just a simple fact that the more you get over time, it accumulates slowly over time, the more radiation you receive the more likely you are to get cancer, which is presumably why old people get cancer because by that time it has developed.

So to say that there is any sort of actually safe dose is just not true.

THE PRESIDENT: Thank you. Thank you for your submission.

MS CARTER: Yes.

THE PRESIDENT: The next presentation is by Mr. George Fogarasi, as outlined in CMD 20-H2.13.

Mr. Fogarasi, over to you.

CMD 20-H2.13

Oral presentation by George Fogarasi

MR. FOGARASI: Hello. I'm George

Fogarasi.

You all worked late last night. I was watching you online. And you worked diligently and with respect. You paid close attention to the intervenors. I want to believe you are impartial professionals working from a space of goodwill.

This is democracy, civil society at its best. But is there a system of bias built into the process that is hard to see? Let me ask you this. Can you imagine nuclear pelleting in Rosedale?

BWXT leverages archaic zoning laws in a poor neighbourhood to do work that would never be zoned today. Their applications reads: "The Peterborough facility is located in a mixed industrial, commercial and residential area."

This is a legal fiction. It's a couple of blocks away. Walk over, take a look. You will see funky buildings repurposed for a rock climbing gym, an axe throwing emporium, book publishing and guitar repair.

BWXT is the only industry.

The application is built on the fiction that rock climbing is an industrial activity. Are you kidding me?

Can you imagine nuclear pelleting in Ottawa's Byward Market? It's a quaint neighbourhood. There's restaurants and cheese shops. Nothing industrial, but in the 1800s a saw mill, a candle factory, meat packers.

But nobody is suggesting this means a slaughter house should be set up today beside Mexicali Rosa's.

Nowadays no factory would be zoned across the street from an elementary school. You know this.

The BWXT plant was built in 1892. Canadian women could not vote. Slavery was legal in many countries. We don't grandfather these things and accept them. Why do we accept the factory in a location that would never be zoned industrial today? Because it's a poor neighbourhood.

Can you imagine nuclear pelleting in Westmount?

Our culture is learning to see injustice when it comes to race, gender and endogeneity, but marginalization based on socio-economic status remains largely invisible.

This consultation process, what we're

doing right here, it assumes a very high level of literacy and cultural capital. It's not just a communication problem; there's a built-in bias that suits people.

What does it mean in the licence application when there's terms such as "trends and non-conformances for closure metrics"? What does that even mean? I've got three university degrees. I can't follow this stuff.

Can you imagine pelleting in Forest Hill?

A transparent and fair intervention process would be known by the community. Here's an example of how the process doesn't work.

In December CNSC sent out a notice. The notice stated that participant funding information was published in June with a September deadline. This is absurd. Writing in December about a funding window from the previous June to September?

This looks like a disingenuous box-ticking. It is to genuine consultation what axe throwing is to industry: a convenient fiction.

Dr. Velshi, almost exactly a year ago you gave a talk at a Women's Leadership Forum. You spoke eloquently about gender bias, that The Iron King speaks to

boys, not girls. It's a nuanced and important point. You spoke about "addressing systemic bias".

Sometimes systemic bias is really hard to see for those who benefit from it.

Can you imagine nuclear pelleting beside Havergal College?

We all agree there's a risk. We wouldn't be here if there is no risk. That's not the question. The question is: Why is the risk worth it? And I'm asking you: Why is the risk worth it in a poor neighbourhood in a struggling town?

This is what systemic bias looks like. Can you see it?

Peterborough consistently has one of the highest unemployment rates in the country.

Join me in a little exercise. If I say an Ohio school was closed due to radioactive contamination from a plant BWXT was involved with, what's your first reaction? Quickly, what comes to mind?

If you think oh, that's a different process, you're deep in the weeds of industry. But if you think why is the school close enough to be contaminated, that's big picture impartial thinking. That's thinking

like the public.

If you think zoning, that's a municipal matter, it's not our mandate, you're passing the buck, you're ticking boxes, calling axe throwing an industry.

But you can address an 1892 anachronism. You have the rare power to make a real difference, to right historical and contemporary wrongs. The choice is yours. This is not 1892. No industry would be zoned there today.

It is International Women's Day on Sunday. Dr. Velshi, last year you gave a talk on Women's Day at the Ismaili Centre and the theme was civil society champions living the social conscience of Islam.

Would a civil society champion support industry beside Upper Canada College? No. Then why support it beside Prince of Wales?

I urge you to deny the request for pelleting and create a shorter licence renewal to allow for a far more accessible consultation process to develop.

Dr. Berube, last night you said you were "looking for ways to question" -- I offer these to you -- and that you wanted to be "fair and equitable".

Will you perpetuate or address systemic bias?

Dr. Demeter, you spoke eloquently about how Commissioners are independent and have professional alliance. As individuals I'm certain you feel like impartial regulators. You kind of even appear that to me. You are sincere. But is the process impartial? Is there a built-in bias that's hard to see?

As my friend Nick says, the world has a crisis of democracy because people doubt the legitimacy of supposedly democratic and impartial institutions that claim to represent people but really represent an elite.

Who does this process represent? Is it about satisfying the licensee?

Show us that you are working from an unbiased space of goodwill by treating Peterborough as you treat Rosedale.

Thank you.

THE PRESIDENT: Thank you for your very eloquent submission, Mr. Fogarasi.

We will turn to Dr. McKinnon.

MEMBER MCKINNON: Thank you. You raise a lot of very good and complicated points that would take a long time to really go through. One point that resonated with me was we tend to pick on detailed questions which are

down in the weeds. So it made me think that maybe this is a time to ask which for me may be a bit of a naïve question but I'm going to ask it anyway of the company.

A lot of the discussion has been on beryllium and monitoring it, but if we look at the other end it struck me: In the manufacturing could you describe what are the primary requirements of using beryllium in the first place and would there be any other engineering solutions? And what are the particular constraints that you have that make you stay with the use of beryllium?

MR. MacQUARRIE: John MacQuarrie, for the record.

We do not design our product, our fuel product. There are other agencies that are the designers of that. We build it to a technical specification that's provided by our customer. It's a very precise and detailed specification and it does require us to use beryllium at the moment.

That being said, the industry does recognize that there are hazards with beryllium, so there has been significant and considerable work done looking at alternatives to that.

So I would say that there's been some

progress there. There's been testing done that we participated in. There's been irradiations and post-irradiation examination to confirm that alternate materials which are less hazardous could be used, and we're working through that in a methodical way.

Also, ourselves, we've looked at if we're requirement to use beryllium, which we are, to make our product, how could we do it differently?

Certainly over the years there have been changes in how the process is implemented, controls and things like that. We've looked at different ways of fusing beryllium onto the appendages, and we continue to look at that and investigate that. Even at this time we're looking at that.

So it's not that we accept the status quo. We continue to look at how we can do it more safely.

MEMBER MCKINNON: Are there any potential timelines that you are aware of for changing from the use of beryllium?

MR. MacQUARRIE: So in terms of actual material change where we no longer use beryllium, we are actively engaged with our customer at this time, saying we think that we can change and go to a different material.

We need to get their agreement so we need to work through that.

There is no specific date set for that decision, but we are regularly, including in the last week, talking to them about that.

THE PRESIDENT: Dr. Demeter.

MEMBER DEMETER: Thank you very much for your presentation.

I gather that there is a City of Peterborough representative here? Is that correct?

Maybe you can help us understand from the city's point of view how you take safety of individuals and the environment into consideration when you make decisions about residential, commercial, industrial and how you deal with evolution of time for such decisions.

MR. HETHERINGTON: Madam Chair, through you, I'm Ken Hetherington. I'm the Chief Planner for the City of Peterborough.

It's a complicated answer in terms of when we deal with planning applications we deal with them on a site-specific and on their own merits. We have a lot of older industrial areas that are still zoned for industrial uses. Industry has obviously changed over the years. We

have different categories of industrial.

When we're dealing with land use applications we have to have regard for provincial policies from a land use planning perspective. That includes mitigating adverse impacts as best we can, avoiding sensitive uses to incompatible uses.

If we were dealing with greenfield development, yes, we would typically look at avoiding close location of sensitive uses and what we would call more industrial uses. In older areas of town that's a little more difficult because we have quite a few older industrial properties that have converted over time. Some are still industrial, like the GE site is.

But when we deal with incompatible uses we look at trying to best mitigate adverse impacts, whether that's noise, lighting, truck traffic, those types of opportunities.

They are dealt with on their own merits. Each site and each development is different. So there's not one kind of catch-all magic bullet that solves everything.

MEMBER DEMETER: Thank you.

THE PRESIDENT: Maybe I will ask BWXT.

And I can sense the frustration from many, many intervenors, including yours, that it's sort of passing the buck. We look at it from is there going to be a health impact but there is this whole issue of perceived risk as well.

So when it comes to you looking at maybe relocating your pelleting facility, what role does that play in your decision around the perceived risk of the community, that there is a school nearby? How do you factor that in?

MR. MacQUARRIE: It's John MacQuarrie, for the record.

So in the event that we would think about moving that facility, we do take into account very seriously the health of our employees and of the public, the environment, and factor that into our decision-making.

When we look at the specific example, we are confident that we are not impacting the health of the employees or the public or the environment. Whether we do that in Toronto or in Peterborough, we are confident that we have no impact on either community.

THE PRESIDENT: Right. That's why I used the word perceived risk as opposed to the actual risk.

As we've heard from an earlier intervenor, I think in Toronto, for many the perceived risk is no different than the actual risk. So how do you factor that in?

MR. MacQUARRIE: So if I understand your question correctly, it's in terms of the community's perception of what we're doing and how that impacts them.

Yes, we need to do a better job of that, absolutely, and we are going to do that, as I've committed.

We need to do a better job explaining that the product we work with comes from the environment that is all around us. It is natural uranium. It is weakly radioactive.

We can explain to them, for example, that in the spring when we all start to work on our gardens and there's about six or seven yards of topsoil that shows up in the neighbourhood, the uranium in that topsoil is equivalent to about what we would emit annually from our plant if we're pelleting.

We can talk to them about when you excavate a property and you remove all the soil and you pile it up because you're putting a foundation in, there's far more uranium in that soil that we would ever emit from

pelleting operations.

Or that building that's coming down, the old Sears plant at the corner of Lansdowne and Monaghan, where they've taken that building down in the last couple of weeks, there's a lot of uranium that's in that building and that's being exposed to the air. It's all around us: in those building materials, in the ground where we garden and the water that we drink.

So we need to do a better job of explaining that because I think if they understand that, they may feel much less fear about what we do.

THE PRESIDENT: Dr. Berube.

MEMBER BERUBE: Well, I want to thank you for your presentation -- eloquent -- very eloquent presentation on the issues with social justice, and I think that's fundamentally where you're targeted at.

Our mandate is very, very tight -- and you're aware of that, as well -- and so there are limitation within every society on you know how to address the bigger picture issues that you're trying to address, and there's -- so, here, at this table we have to really tightly stick to our mandate which is to worry about the safety, security and protection of the environment. And

the threshold for evidence in that is extremely high from a scientific standpoint. We take into account many, many arguments, but at the end of the day we really have to look at that as the deciding factor, and we do this -- we do this all the time; we debate amongst ourselves. So, just so you understand that none of your arguments or your desires are being missed.

That being said, at the end of the day we have to really look at what the science says because otherwise we're just guessing, right? So, I'll just leave that there.

In terms of the licensee and in terms of dealing with the radiation protection of the people, I'm going to ask CNSC, is there anything in your opinion that causes any undue risk to the people that live immediately around either the sites in Peterborough or Toronto?

MS TADROS: Haidy Tadros, for the record.

So the short answer is no, but I would like to take the opportunity to acknowledge that when we do see something, either in the background or something that warrants further investigation -- we talked extensively about beryllium -- there are actions taken, so it's not a 'no,' and we turn our backs and go on with our next file,

it's a, No, but we need to look into this; No, but we need to verify it with other authorities; No, but we need to put requirements on the licensee so that we can double-check on things. So, it is -- it is a "no," but it is a, continue with making sure that that no is a solid no. And that's the situation that we're in with this file in particular.

THE PRESIDENT: Dr. Lacroix.

So back to you, Mr. Fogarasi. Any closing comments?

MR. FOGARASI: Thank you very much. Dr. Berube, I do respect that you have constraints. I have the luxury here to go fuzzy and meta, but I, you know, want to think about what you're doing.

What I do resent is the consistent notion that if we only understood, we'd agree that it's safe. We've got medical experts on all sides saying different things about radiation that you're trying to figure out. But this notion that it's a communication problem is really condescending; that if they said it the right way we'd agree.

This is part of a system with bias, a sort of clouding with language and experts. Look, gender and race. We look at Saudi Arabia where women have a guardian.

Wow, that's wrong. We look at the oppression of Rohingya or the Roma in Hungary, we go, Wow, that's wrong. In Ontario we have pay equity efforts, we have diversity hiring. So we look at class and gender as a systemic bias, you understand that. But, when we -- I'm sorry, we look at a class and race and nation, not -- we look at gender and race and nation. We do not look at class. We go with what's natural, you know, there's rich, there's poor, it's natural.

In Saudi Arabia, they said well, women, it's natural, they need a guardian. Those Rohingya, well, they're not human, it's natural.

When we say this is natural, that's a systemic bias; that's ideology, so we have a systemic bias here.

I leave you with this, BWXT in Toronto, the place used to be called The Foundry, an industrial area now gentrifying into The Junction, lots and lots of condos. So, just -- just ponder this, are you structurally complicit in outsourcing dirty work from a rich neighbourhood to a poor neighbourhood?

Thank you.

THE PRESIDENT: Thank you.

Our next presentation is by Mr. David Berger as outlined in CMD 20-H2.205 and 205A.

Mr. Berger, over to you.

CMD 20-H2.205/20-H2.205A

Oral presentation by David Berger

MR. BERGER: Good morning. Thank you, Madam President and members of this committee for the opportunity to speak with you this morning.

My name is David Berger and I am the first Vice-president of the Kawartha Pine Ridge Local for the Elementary Teachers Federation of Ontario. I represent 1400 teachers in our Board including the 50 or so who make up the bulk of the staff at Prince of Wales Public School in downtown Peterborough.

Additionally, I am the worker co-chair of Kawartha Pine Ridge's Joint Health and Safety Committee for Teacher Workers. This is a multi-site committee that represents the health and safety concerns of approximately 3000 teachers in our Board at 116 school sites.

On a personal note, I am a resident of Peterborough and live within half a kilometer of BWXT. My

daughter currently in Grade 10, was a graduate of Prince of Wales Public School, and my spouse is currently an early childhood educator at the school. You will hear from her tomorrow as she is scheduled to make an oral intervention at that time.

I am here to share my members health and safety concerns, specifically in relation to Prince of Wales, one of our biggest downtown schools in Peterborough and one that is located about 50 meters from the main gates of BWXT.

Indeed, many of the intervenors presenting written and oral interventions in the next few days are public teachers in our Board.

Although my purview under the *Occupational Health and Safety Act* is the health and safety of workers at the Board and not students *per se*, it is almost impossible to make that distinction in practise. Teachers take our responsibility to act in *loco parentis* for our students to heart and it is a cornerstone of our professional responsibility under the *Education Act*. The bonds that we make with our students and their families are what gives meaning to our work on a daily basis, and anything that puts student safety in jeopardy must be

addressed.

I am not a scientist, nor am I particularly versed in the debates surrounding nuclear production and the processing of uranium pellets. Like most teachers, I rely closely on the expertise of scientists and healthcare professionals in my community when it comes to health and safety advice. So when a group of professors from Trent University and the Chief Medical Officer of Public Health raise concerns over the physical conditions of one of our school sites teachers take note. I'm referring specifically here to interventions CMD 20-H2.199, 244, and 139.

These three intervention, in particular, raise serious questions about the increases in levels of beryllium in soil samples specifically those taken at Prince of Wales Public School. Although readings have remained under the threshold limit values for beryllium as Dr. Aherne argued yesterday, it is not the level of beryllium measured in soil that is alarming as it is the rate of increase in those levels from readings taken in 2014, 2018, and 2019.

If that rate of increase continues, as has been monitored by an independent environmental monitoring

program, I am led to understand that it will not take long for those levels to exceed threshold limit values for safety.

I understand that BWXT monitors for beryllium continuously in stack at its facility and that its own readings are negligible. And yet that does not account for the findings of the IEMP.

I quote Robert and Dale DeMatteo, researchers with the Occupational Health Clinic for Ontario Workers when they present research on 33 GE Peterborough compensation claims filed with the Workplace Safety and Insurance Board for beryllium disease:

"With respect to beryllium in nuclear bundle production at the Peterborough site, exposures were not well controlled. Levels were recorded that were 100 to 2100 times higher than the current regulatory limit. There is no doubt that contamination in the schoolyard could only have come from the fuel bundling operations given the plant's very poor exposure control practices."

Likewise, Dr. Aherne writes in his intervention:

"This analysis indicates that (a) it is extremely likely beryllium concentrations in soils have significantly increased in response to emissions; (b) BWXT is very likely the source of the beryllium emissions; and, (c) beryllium air concentrations during 2014 to 2019 were likely above the ambient air quality limits."

I understand that GE's historical health and safety practices are not the same as BWXT's current practices. However, it is nonetheless alarming to hear that there will be -- there will possibly be new production at the BWXT site that will involve increased use of beryllium virtually across the street from a kindergarten playground when beryllium is already present at these levels in soil samples.

Our city's Chief Medical Officer of Health Dr. Rosana Salvaterra writes in Peterborough Public Health's intervention:

"As the beryllium results have recently come to light, it would be most prudent to investigate with the establishment of a more comprehensive environmental monitoring program to be done first, prior to the decision regarding the renewal of the licence and/or the moving of the pelleting process to the Peterborough site."

Given this information the executive committee of the Kawartha Pine Ridge Elementary Teachers Federation Local passed the following motion: That the Kawartha Pine Ridge Local of the Elementary Teachers Federation of Ontario bring to the attention of the Canadian Nuclear Safety Commission that it opposes the renewal and expansion of BWXT's license at its Peterborough location until the source of increase beryllium contamination in soil samples at Prince of Wales Public School has been determined.

Thank you for your time and for your attention this morning.

THE PRESIDENT: Thank you Mr. Berger, for your submission.

Dr. Demeter?

MEMBER DEMETER: Thank you very much for your submission. I'm going to have a question for BWXT. I'm going to drill down a bit on this.

So under your current licence, there is an obligation to implement and maintain a program of public information for the facility including a public disclosure program. Given the significance of the stakeholder, of the school being beside you, the schoolboard of the motion, I'd like to hear specifically what your interactions are with the school, with the schoolboard? How do you communicate and disclose information to them? And then I'll ask the intervenor to see if that -- to check to see where that's going.

MS CUTLER: Nathalie Cutler, for the record.

The Prince of Wales School is a very important stakeholder to BWXT. We do have a long history of engaging with them. Our primary means of keeping them informed includes informing their principal and vice-principal of changes in our business, so that would include the re-licensing process through -- at the time we made our application.

We are also a very active volunteer, volunteering at events with our volunteer-strong group.

In addition to that, we engaged with the parent council in January of 2019, shortly after making our application for license renewal to ensure they were aware, as well.

We took part in a meeting at the school with parent-council leadership. And in May of the same year we worked together to set up a tour, a meeting and tour for parents interested in learning more about BWXT and carried that throughout - I'll check my notes here -- that was in May, sorry. So, between January's meeting and May we were working with parent council members to set up that event, and it was carried out in May.

So the school is also on our Newsletter distribution list and there have been attempts by, I believe, members of the school leadership to share some of our newsletters with parents as well, to keep them informed, and we appreciate those efforts very much.

That is a summary of some of the things we have done to ensure the school is engaged.

MEMBER DEMETER: And before I talk to anything, I just wanted to -- and I think -- I'll see if I've got the right terminology, community liaison

committee, is that -- there's one that is going to be set up for Peterborough. Will it specifically include stakeholders from the school, the school administration, teachers?

MS CUTLER: We would very much like that to be the case, and so we are going to be ensuring that the schoolboard and the school leadership, parent council is aware. They have been informed about our community liaison committee to hopefully draw some interest in joining -- a very important stakeholder to us, so yes, we will be encouraging that.

MEMBER DEMETER: And for the intervenor, the issue of public disclosure and providing information was a big part of this hearing to date and talked about extensively when we were talking about Toronto.

From your point of view, do you feel that there's been -- what are the -- what is your understanding and feelings and opinion about disclosure and public information specifically to the fact you have a school right beside it, and to your constituents?

MR. BERGER: Well thank you for the question, and I would like to clarify that. I do not speak on behalf of the schoolboard, but I do speak on behalf of

the teachers in that school.

I will tell you that the issues that have been -- that have come up in the media in the past couple of months were never raised at our joint health and safety committee meetings until I asked for that to come onto the -- onto our agenda. And after that, as far as I understand, it was communication between our superintendent and Peterborough Public Health. I know that he received some questions from questions from -- from parents and responded to those you know, and he posed those -- passed those questions on to Peterborough Public Health who addressed them on their website.

I would like to ask that the -- that BWXT and its outreach makes sure that the outreach also involves the workers in those schools, and the way to do that would be through our joint health and safety committee.

THE PRESIDENT: Thank you. Did you make a note of that, BWXT?

Dr. Berube?

Dr. Lacroix?

MEMBER LACROIX: BWXT, when I listen to you it seems to me that you're engaged with the local community. But, on the other hand, are you surprised of

their opposition to your presence in the neighbourhood?

MS CUTLER: Nathalie Cutler, for the record.

Up until I would say approximately June of 2019 we -- we had not received any concerned citizen phone calls to our hotline or email address and so, yes, it's fairly recent that we have seen an uptick and a very large one in concern regarding our presence. And, you know, what we're working to try to resolve is a very -- a concerned community that very recently has made their presence known to us and their concerns are very important to us, and we want to address those and demonstrate that we are trustworthy, we are safe and that there's no reason to fear our existence and what we do, we offer great things for our community from good jobs to clear air, and volunteerism and we're proud to be part of this community and we want to demonstrate that.

MEMBER LACROIX: Have you identified this sudden opposition, the event that triggered this sudden opposition?

MS CUTLER: I'm sorry, could you repeat that, sorry?

MEMBER LACROIX: Have you identified the

event that triggered this sudden opposition to the renewal of your license?

MS CUTLER: Yes. When we made our application to the CNSC for a licence renewal, we were very forthcoming with the public about that application, so immediately after our newsletter the front page of it stated that we have submitted an application for licence renewal, and right forthcoming with that process we -- we outlined that we are requesting the option to conduct pelleting. And so by being transparent and forthcoming we knew that that could spur some concern and it has. And since that time we've seen opposition.

But we think it's the right thing to do, to be transparent, open, and tell the public that -- that clause within our application and we're addressing that now.

THE PRESIDENT: Dr. McKinnon.

MEMBER MCKINNON: Yes, I'd like to ask some questions about the -- you made a comment that you are part of a joint health and safety committee, and I presume the company also has one for its workers. And normally unions are very well organized and the members would talk to each other. So, outside of the company do the two

groups talk, and you know what concerns are brought up in regard to health and safety in connection with the company here, from the broader membership?

MR. BERGER: Thank you for the question. I think it would be an understatement to say that the teacher unions have been extremely busy, occupied in other things in the province in the last couple of months. But I -- you know, I am not trying to belittle the question. I have not had the time to reach out to workers from BWXT and it's a great suggestion, and I thank you.

THE PRESIDENT: Quick question for you, Mr. Berger. Your concern seems -- I mean, I know we heard from BWXT that it was the licence renewal application that may have triggered a lot of interest and concern. From your written submission, in particular, it seemed it had a lot to do with the elevated beryllium levels in the soil that got you know you folks concerned about what's going on here.

So, again, can you share how large a role has that played? Because it seems suddenly there must be something dangerous going on if this is what's happening in our environment?

MR. BERGER: Thank you. So, I actually --

I resubmitted my submission on February 18th and focussed particularly on the beryllium issue because that is what is most acute in the minds of the teachers as they see children in a kindergarten playground in sandboxes interacting with the dirt as children do, and given -- given what we have found out about the results of the independent environmental assessments so that, in particular, is what we're concerned on, and it's on our schoolyard.

THE PRESIDENT: Thank you. Mr. MacQuarrie did you want to add anything?

MR. MacQUARRIE: Yes, thank you. I just wanted to follow up on the question about our joint health and safety committee and willingness to work with -- with the teacher's health and safety committee. We're certainly supportive of that, of management, and I'd just like to say that in a couple more interventions we do have one of our employees who will be making an oral presentation and I think it would be good to ask him about that.

THE PRESIDENT: Thank you.

Mr. Berger, any final comments?

MR. BERGER: No, thank you for your time.

THE PRESIDENT: Thank you for your

intervention.

We'll now take a 15 minute break and resume at ten to eleven.

Thank you.

MR. LEBLANC: Also, for those who are presenting later today or after the break, please identify yourself at the reception so we can know when to go and invite you to the front.

Thank you.

--- Upon recessing at 10:35 a.m. /

Suspension à 10 h 35

--- Upon resuming at 10:50 a.m. /

Reprise à 10 h 50

THE PRESIDENT: Welcome back, everyone.

The next presentation -- if I can get you to take your seats, please.

The next presentation is by the Curve Lake First Nation, as outlined in CMD 20-H2.101.

I understand that Chief Emily Whetung and Chief Laurie Carr will present on this submission.

The floor is yours.

CMD 20-H2.101

Presentation by Curve Lake First Nation

CHIEF CARR: (Aboriginal language spoken.)

Good morning, everyone. I am from the Deer Clan. My spirit name is Eagle Woman, my English name is Laurie and I am Chief of our community of Hiawatha First Nation, for the record.

I would like to stay chi-miigwech, Ms President, for the opportunity to speak here today. I am presenting today with Chief Emily Whetung of Curve Lake First Nation and our colleague is joining us, Chief Reg Niganobe from Mississauga.

We are representing the rights and interests of the Mississaugi and Williams Treaty communities and peoples. We want to make clear that we are the spokespersons to rightfully represent our Treaty and traditional territories with authority.

As we gather, I would like to start with a land acknowledgement. We respectfully acknowledge that we are located on Treaty 20 Mississaugi traditional territory and in the traditional territory of the Mississaugi and

Chippewa Nations known as the Williams Treaties.

We respectfully acknowledge the Williams Treaty First Nations are stewards and caretakers of these lands and waters and that they continue to maintain this responsibility to ensure their health and integrity for generations to come. So I would like to welcome you and everyone here today to our traditional territory of the Mississaugi.

Once again, Ms President, Members of the Commission, CNSC's Executive Committee members, CNSC staff, BWXT representatives and those who have participated in the process, we acknowledge your work in preparation for this process. We have been watching the entire hearing thus far and will continue to do so until the end.

We have listened to the various legacy, current and future concerns presented by others throughout the hearing process. We will not use our time today to delve into and perhaps repeat such concerns. We would like to address these items with BWXT and CNSC when we have had time to digest the answers given throughout the hearing process.

We do not support the application on the basis that meaningful and substantial consultation has not

been conducted by BWXT. This does not necessarily mean that we actively seek to oppose the application or the ongoing and future operations conducted by BWXT. We do require improved, meaningful and substantial consultations by BWXT before a licensing decision is provided.

We are seeking a deferral of the CNSC decision until meaningful and substantial consultation has taken place with BWXT, a mechanism for active involvement with us on the various CNSC review framework, processes and milestones has been developed.

CHIEF WHETUNG: Miigwech. (Aboriginal language spoken.)

For the record, I am Chief Emily Whetung of Curve Lake.

I would like to take a moment to walk you through some of the duty to consult provisions that have become apparent to me in my role.

First and foremost, in the case of *R. v. Badger*, the honour of the Crown is always at stake when it is dealing with Indian people.

In *The Carrier Sekani Tribal Council and the B.C. Utilities Commission*, the Supreme Court of Canada held that when the Crown has knowledge of a potential

aboriginal claim or of a Treaty interest there is a duty to consult. When the Crown is conducting or contemplating making a decision which would cover -- sorry, where potential impact is contemplated on aboriginal rights or Treaty rights, the duty to consult is engaged. The contemplated conduct has to have the potential to adversely affect an aboriginal claim or right.

In this situation, in the hearing so far, I have heard lots of conversations about potential impacts, about the fact that they are all below standards, which is absolutely fine and great news. However, there are potential adverse impacts to aboriginal rights, to our Treaty rights. The B.C. Utilities Commission was found in that case to have had a duty to consult.

I would like to take you also to the *Clyde River v. Petroleum Gas* case that the Supreme Court considered. Specifically, a regulatory body could fulfil all or part of the Crown's duty to consult. The court found that the National Energy Board in that case had acted on behalf of the Crown when it made a decision. Specifically of note in that case, there were Treaty rights at stake. The Crown's duty to consult in that case was a deep consultation was required because an established

Treaty right that was important for the economic, cultural and spiritual well-being of Clyde River was at stake.

Curve Lake and Hiawatha enjoy constitutionally protected Treaty rights. In our situation in this case, which is very similar to *Clyde River*, we do not feel that meaningful consultation has taken place. Chief Carr will walk you through that a little bit more.

In *Clyde River* they also noted that the Crown has an obligation to decide whether the regulatory process is sufficient to meet its duty to consult and if it is not the Crown must take other steps, including seeking a postponement in order to carry out further consultation in a separate process. And that is what we are here to ask for today, a deferral of this licence application so that meaningful consultation, deep consultation can take place.

CHIEF CARR: Indian peoples as defined by the *Indian Act*, engagement is not stakeholder engagement. If a stakeholder does not like what a proponent is proposing to do, they can lobby their MP, MPP, others, to try and effect changes. They can also engage in negative media campaigns and/or other actions. Indian peoples can also do the same. However, we have the ability to launch legal action to enforce our Treaty and constitutionally

protected rights under section 35 of the *Constitution Act, 1982*, which recognizes and affirms the existence and Treaty rights of Indian peoples.

This can put a project in jeopardy, enforcing the proponent's governments to conduct additional engagement. Time is money and no proponent wants to be delayed on a project by a drawn-out legal battle when meaningful consultations with the appropriate rights holders could have occurred very early on.

Engagement at a superficial level has been attempted and reflected in the BWXT submission, but this is not enough effort nor depth to properly inform us on the substance of the application and the potential implications and impacts to the community.

While we can acknowledge that letters, emails and attachments sent is an attempt, there needs to be sufficient capacity and clarity in the under action along these initiating actions to be able to receive, review and understand the substance and nuances within. There needs to be specific face-to-face discussions on the subject matter and clear and direct communication on the matter at these opportunities.

We noted that CMD 20-H2.1, Written

submission from BWXT Nuclear Energy Canada Inc. states:

"The Communities of Interest (COI) for BWXT NEC in Peterborough and Toronto are as follows:

Mississaugas of Scugog Island
First Nation

Chippewas of Rama First Nation

Curve Lake First Nation

Hiawatha First Nation

Chippewas of Georgina Island
First Nation

Chippewas of Beausoleil First
Nation

Métis Nation of Ontario

Mississaugas of the New Credit
First Nation."

I would like to ask how specific consultation has been with each community on the list and to also make note that the Mississaugis of Alderville are not on this list.

As a specific example, we have not been engaged or consulted by BWXT regarding their licence application to allow pelleting at their facility in

Peterborough.

We met with BWXT at their facility in February of 2019 to discuss their moly project. Not once did they mention the licence application.

We received correspondence from BWXT in the form of multiple emails and letters directing us to their website links regarding their licence application. The correspondence that we received spoke to a licence renewal to continue operations, with no clear mention of the desire to actually manufacture the uranium pellets in Peterborough.

As to continued operations, we did not have any immediate new concerns as the current environmental monitoring situation surrounding the facility seemed to be portrayed as to have no new challenges, but we did not really know the details and impacts of the operations, the potential future operations and our ongoing issues and concerns, including legacy issues and concerns that are not resolved.

Some of these concerns are those that have been similarly articulated by others throughout the hearing thus far. However, of particular importance is emissions and cumulative impacts, not just for 5-10 years down the

road, but for all our seven generations to come.

We were informed by Citizens Against Radioactive Neighbourhoods that the application actually includes the proposal to manufacture pellets at the Peterborough facility. This is quite embarrassing, considering that we had met with them and they didn't disclose that information to us.

Our consultation offices contacted BWXT directly, asking them point blank if they were applying to actually manufacture pellets. The response was, "All information is on our website." We sent a second email reiterating our question and BWXT finally stated that they were indeed applying for a licence that includes manufacturing of pellets at their Peterborough site. BWXT has also indicated to us that they have no plans currently to develop these pellets in Peterborough, but may decide to do so in the future.

We have had no meaningful consultation regarding the licence application. We do not know what, if any, impacts this may have on our aboriginal and our Treaty rights. We would like to have a fulsome and meaningful consultation with BWXT regarding this licence application so that we may be fully informed on the depth of this

proposal.

We would like to develop meaningful relationships with both BWXT and the CNSC moving forward. Again, not once did pelleting come up in the various meetings, the information provided thus far neither timely nor adequate. There is a perception that the lack of transparency perpetuates a lack of trust.

Chief Whetung...?

CHIEF WHETUNG: Miigwech.

Chief Whetung, for the record.

It's this new process of pelleting that triggers the duty to consult in this situation. In *Clyde River* the court specifically states that dialogue with proponents was not sufficient.

To close, we do not support the application on the basis that meaningful consultation has not been conducted by BWXT. This does not necessarily mean that we actively seek to oppose the application or the ongoing and future operations conducted by BWXT. We do require improved, meaningful and substantial consultation by BWXT before a decision is provided. We are today seeking a deferral of the CNSC's decision.

We are seeking to be an active contributor

to the CNSC's review framework and process following any decision on the application. We may not necessarily agree with the assessment and the details the CNSC staff -- with the CNSC staff and thus we want to be part of the ongoing process, including but not limited to the review of additional environmental monitoring before pelleting operations and review of safety with current operating limits before pelleting operations, including all aspects of routine operations and future environmental assessment submissions.

We are offering to actively work with BWXT to demonstrate what consultation could look like and, more importantly, to build and formalize a relationship beyond regulatory consultation matters. We are committed to working on this with BWXT immediately following this hearing.

This will support BWXT in their efforts to be progressive aboriginal relations certified with the Canadian Council of Aboriginal Businesses and also to provide further tangible evidence to support their Canada-wide company policy for indigenous relations.

This will help our communities build capacity and regulatory consultation and other matters that

are of critical importance to our communities in the areas of community relationships, education and employment, including training and apprenticeships, business development, economic development, environmental stewardship protection, including lands, rights and resources and regulatory consultation, community development, self-sufficiency and resiliency.

We are also offering to work with the CNSC to define and formalize an ongoing relationship to address issues, challenges, impacts and opportunities presented by various projects and proponents in the nuclear industry, to look at these not just individually but in a holistic and integrated manner. We are committed to working on this with the CNSC immediately following this hearing.

We recently received CNSC staff's communication on the CNSC's Independent Environmental Monitoring Program 2020 sampling campaign preparations. We welcome the opportunity to input into the IEMP to provide meaningful results to our communities.

As it is a priority for the CNSC that the CNSC sampling reflects indigenous traditional land use, values and knowledge where possible, it is also a priority for us. This represents just one example of where we want

to be actively involved.

In closing, we would like to acknowledge the work of the Commission, the CNSC staff, BWXT representatives and other participants in preparation for this process. We look forward to building a stronger and more meaningful relationship in the very, very near future. Miigwech.

THE PRESIDENT: Miigwech. Thank you very much for your submission.

Dr. Berube...?

MEMBER BERUBE: First of all, welcome and thank you for coming and sharing your views. I want to say that it was extremely articulate, very clear what your expectations are, and at this point I'm going to turn the floor over to BWXT for their response to the things that you have mentioned, followed by the CNSC's response to that position as well.

MS CUTLER: Natalie Cutler, for the record.

I really appreciate you coming today and speaking to the Commission and sharing your thoughts and concerns.

I want to acknowledge that there has been

a complication in the process of trying to engage with Curve Lake and Hiawatha First Nation among our other communities of interest and that is that BWXT, being a large organization, is currently pursuing two licences, one that involves medical isotopes that is unrelated to why we are here today and another that is why we are here today, our fuel facility operating licence.

So I understand that that has a lot to do with why there has been confusion with Curve Lake and Hiawatha upon meeting with us in March of last year, which was specifically to discuss the isotope project, which is why the fuel facility operating licence was not discussed, because it was a different file. So I want to make that clear and I apologize, that is confusing.

We commenced communications with Hiawatha and Curve Lake First Nations back in 2018 when we joined the Canadian Council for Aboriginal Business in our efforts to improve indigenous relations and really make our presence known. Since that time we have sent many communications, as they have alluded to, and we need to do better to follow those up with phone calls, drop-in, more meaningful ways to engage. We understand that.

I want to acknowledge that the first

package that we sent about our licence renewal went in December following our November application and it, just like our newsletter said before we went for a break, very openly explained that as part of our licence renewal application we have requested one change and that is pelleting, because we wanted to be forthcoming with that.

Now, you know, in their defence, this was a lot of information. As part of our cultural sensitivity training that we took, it was suggested that we send that in packages. So it was a lot of paperwork. We sent the application itself, a letter detailing that request as well as the Environmental Risk Assessment, and we followed that with several email communications requesting to meet with them so that we could explain it, because we know that that is a lot of information and some of it very technical.

So I just want to acknowledge that we hear what they are saying. Absolutely, we need to make improvements with how we engage with them. The fact that there were two licences being pursued by BWXT at the same time complicated matters.

We did have a phone call with Dr. Kapyrka of Curve Lake in July to clarify the two licences being separate after receiving an email from her stating

Moly/Pellet Program. So we realized we have a problem, we have to distinguish these two projects. And so we did have that call and it took a while, but we did get to go to their community and meet with them on January 8th and it was a wonderful meeting. We got to learn a lot at that meeting. We appreciated being hosted by them. However, by the time we got to the end of our meeting we didn't have the opportunity to present on the file again.

So we acknowledge that there is improvement to be made here, but I wanted to kind of explain the nuances around some of our engagement so that there was an understanding that it has been a bit confusing because of the two licences. But we appreciate the offer to help us improve that.

Our relationship with Curve Lake and Hiawatha First Nation and all of our indigenous communities is very important to us. We are new to this and we want to do well and we want to do better.

On the Alderville First Nation comment -- and that has come up by a couple of groups -- we received an email from a representative at Alderville First Nation stating that, "The City of Peterborough is not in our Treaty Territory. Therefore, we will not be commenting on

the renewal application." So we simply removed them from future correspondence and that's why they are not listed in the CMD. So I hope that answers that question and I am happy to answer any others.

MEMBER BERUBE: CNSC, if you would comment, please.

MS TADROS: Thank you. Haidy Tadros, for the record.

So I would ask our Indigenous Relations expert, who is in the room, to speak to the activities that we have already started with the First Nation and we will continue to ensure an active and informed engagement going forward on this file.

MR. LEVINE: Good morning. Adam Levine, Team Lead Indigenous Relations and Participant Funding for the CNSC.

So I just want to say miigwech and thank you for the Chiefs of the Mississauga Nations coming here today and participating. We know they are extremely busy and really appreciate their thoughts on the process.

From the CNSC's perspective, it is imperative that we reach out to communities with an interest in licensing activities such as this early on in

the process to make sure that they are well informed and can make informed decisions and recommendations to the Commission and to staff.

So as part of this process, in April 2019 we reached out to all the Mississauga Nations and all the Williams Treaties First Nations to inform them of the application from BWXT and in that initial letter we did indicate that part of this application included the request to conduct pelleting at the Peterborough facility.

And then subsequent to that we always follow up with phone calls and we know that of course that is never enough, so we wanted to make sure we met in person to inform the communities and have a discussion further.

So that happened in June 2019 here in Peterborough and some of our representatives, including Julian, the Project Officer, was there to present information on the licence application to representatives from a number of the Mississauga Nations. And in that presentation they did talk about the pelleting request and what that means and how that is currently done safely at the Toronto facility and how CNSC staff are independently reviewing all of the aspects around that, what that would mean for the Peterborough facility, including the

Environmental Risk Assessment and environmental monitoring and a lot of the topics we have discussed today.

And, as you have heard from the leaders here today, we are certainly already in discussion and committed to formalizing our relationship with the Mississauga Nations and others with direct interest in the facilities we regulate and that is something we want to continue to pursue with them to see what that looks like and collaborate on areas like environmental monitoring and sampling and areas of interest for them. So we are fully supportive of that and ready to further delve into those discussions. Because we do meet with their communities on a regular basis, right now about quarterly, because there are a lot of activities, nuclear activities we regulate within their territory. So this is extremely important to us. Thank you.

MEMBER BERUBE: Okay. Let me just summarize what I hear in the room.

Over here we have three Chiefs talking about consultation and over here we have people talking about engagement and I think that is really what the crux of the argument is.

Chiefs, you want meaningful engagement

with your peoples for decision-making; is that correct?

CHIEF WHETUNG: That is correct, but stepping beyond engagement and deep consultation to ensure that our communities are aware of what is going on and that as stewards of the land we have some voice in protecting our traditional territory.

MEMBER BERUBE: So in our experience, every First Nation we talk to has a slightly different understanding of what engagement really means, because it is cultural, it is heritage, there are a lot of factors. Could you just summarize, if you could, as articulately as you could, what you think meaningful engagement looks like?

CHIEF WHETUNG: We have a consultation and accommodation protocol that is available on our website. We have a book that we distribute. We sit regularly at the table with the CNSC right now. Meaningful engagement, meaningful consultation is ensuring that we have the ability, that our staff has the ability to fully understand the impacts of a new pelleting process. It is insufficient to say, "Well, it is just an addendum to a process that we are already doing". This is a significant change in what is happening.

It also -- in 2018, before the application

was filed, the recognition of our constitutionally protected Treaty rights came through with the signing of the Williams Treaty -- what would you call that -- the final settlement of the Williams Treaty claim that had been made. So at that point in time our rights went from questionable to constitutionally protected Treaty rights.

And I also just want to state that that duty arises when it is sufficiently certain that there would be an application for approval, as was the case in the Dene Tha' First Nation in Canada, and that the Crown could not wait until after the application was filed.

So for us it's not just a question of what does deep consultation look like, it's when does that process start. It shouldn't start after the application is made, it should start the moment that anybody knows that that application has a potential to proceed.

So engagement with our community is set out in those pieces that I articulated earlier, specifically building community relationships, education and employment, including training and apprenticeship so that we can understand the information that is being provided to our community. Co-business development and economic development, environmental stewardship and

protections, participation in the IEMP processes, that is our starting point.

THE PRESIDENT: Dr. Lacroix...?

MEMBER LACROIX: Yes. Thank you for your presentation. I really appreciate the fact that it was very respectful. Thank you very much.

Whenever we have a First Nation coming before us, I always have the impression that the First Nation is on the receiving end, and whenever we ask a question about the engagement, I hear about tools of engagement, letters, emails and phone calls. Timmy started asking you these questions, but I would like to pursue.

From your perspective, what do you mean by engagement? Does it mean that you want to be involved? And talk to me about the tools that you consider that you value in your culture which is real meaningful engagement and involvement, not phone calls, not letters. What do you mean by being engaged and maybe involved?

CHIEF WHETUNG: So for us engagement means understanding the processes and having a voice in the impacts that those processes have on our environment, on our water systems, on our lands, on our cultural practices.

And as for the tools, it goes well beyond

a letter. My consultation department receives 30 to 40 letters every week and there are two of them. So sending a letter is insufficient. Sitting down at a meeting about a medical isotope project and running out of time to address a pelleting process when we have limited staff resources is a significant oversight. I don't want to say failure, because failure is unfair, but it's an oversight that doesn't give us the opportunity to fully address all of the issues in terms of our staffing resources.

So those are I think the sorts of things, but engagement includes our entire community. I think that everybody in Canada can see how important that is in this moment. So engaging our consultation staff is a great start, but it's a start and it's not the full process.

THE PRESIDENT: Dr. McKinnon...?

I'm sorry, go ahead, Dr. Lacroix.

Yes, Chief...?

CHIEF CARR: May I also add to answer that question?

In regards to meaningful consultation or substantial consultation, correct, it isn't just letters or emails, it's coming to our community, it's coming to understand -- not only do we need to understand the

process, but you need to understand our process. You need to understand why we are so concerned about the lands and the waters.

You know, this is our livelihood and this is not a First Nation indigenous problem, this is a human rights issue. This is a human issue. We are all affected. When the lands and waters are affected, we are all affected.

And so to us, everyone needs to understand that when they want to develop, we are not saying we are against development, economic development, but we need to understand what is happening. You know, we are not scientists, we are not health workers, so we need to understand what is happening in that process and that can only happen face-to-face, getting to know each other and then going from there in what that process looks like and getting that understanding of each other and why we are here. We are protecting our lands and waters because this is all we have for all of our future.

And so those are really important pieces to the beginning of consultation. It's not just throwing pelleting in a letter and saying, "Did you read it" or "Did you get that?" We have to have that deep, meaningful

consultation of getting to know each other and why and how our differences can mesh, or if they can. Miigwech.

THE PRESIDENT: Thank you.

So let me just follow up with what CNSC staff said, because I think -- so unlike BWXT, they have said they need to do a lot more and they are listening and clearly are on that journey. What I heard from CNSC staff I think is they are trying to meet what you have just articulated, that you meet on a quarterly basis trying to develop a longer-term relationship that's sustained.

Any additional specific advice you would want to give to CNSC on what more they should be doing?

CHIEF WHETUNG: I think the advice would be make it explicitly clear to the Council of any First Nation community when a new process is being considered.

THE PRESIDENT: Thank you.

Dr. McKinnon...?

MEMBER MCKINNON: Thank you for your comments and I think you have made your requirements of consultation and what that involves much clearer. I'm a bit surprised at, you know, why -- I haven't been involved with CNSC too long, but already I have heard this kind of disconnect a number of times. I'm curious about from the

company's point of view what internal process you have for deciding on what manner of engagement and how you would go about it for your different stakeholders, because as we have seen here there are very different interpretations of engagement from the community to the First Nations groups and to other groups. Instead of a one-size-fits-all, it's probably too simple, but what is your internal process for the different groups?

MS CUTLER: Natalie Cutler, for the record.

To your point, you are correct, there are different approaches to each group. Each community is unique and needs to be understood and have different protocols, different stories to share with us and for us to understand, and it's going to be a process for us to learn that of all of our communities and it starts with being together. And we know that the beginning of meaningful long-term relationships is being together. So we highly encourage, you know, hosting indigenous communities to learn about us, but also going to their communities.

That was very beneficial for our team, some of which are with me today, to go to Curve Lake, meet with Curve Lake and Hiawatha First Nation representatives

in January. They played a meaningful video and we learned a lot from it and it starts with that. It starts with getting to know each community individually, understanding their needs, because their needs and their challenges are different.

And as part of our program at BWXT, which we are really trying to improve and we really appreciate the offer to work with us on improving that, we hope to be able to work together on those, because we share this land, too, and we want to make it better together and so we really look forward to that. That is something that is very exciting for us.

I think John would like to add something.

MR. MacQUARRIE: Yes, thank you. So John MacQuarrie, for the record.

So I just wanted to say that we have absolutely heard the message today and we appreciate that message, and so myself as the leader of the company acknowledge the offer for deep consultation and we accept that offer and we will pursue that with a lot of interest and we look forward to that. Thank you.

MEMBER McKINNON: And one final question for CNSC.

I heard an offer here to become involved in the monitoring program in terms of protection of the environment. Monitoring has been undertaken for a number of years here. What has the involvement of First Nations been so far?

MS TADROS: Haidy Tadros, for the record.

Perhaps I will ask Mr. Adam Levine to take that first and if Kiza would like to add anything from the IEMP perspective.

MR. LEVINE: Adam Levine, for the record.

So incorporation of indigenous knowledge and values and collaborating with communities on the Independent Environmental Monitoring Program is central to the program and it's something that has been developing over the years and really been ramping up over the last I would say 3-4 years. So now what we are doing is really trying to get input early on in the process.

So, as you heard Chief Whetung say, they did receive notification about the development of the sampling plan for sampling campaigns that will be happening in the Williams Treaties First Nations territory. So we gave a full list of all the different sampling campaigns that may be of interest and then indicated that we are

wanting to collaborate on developing a meaningful sampling process with them and sampling plan that would reflect their values and interests.

And then it goes to that direct conversation engagement, what that actually looks like for each community. If they already have some valued components or certain locations or species that they may be interested in sampling, we can look at how we can incorporate that where possible.

And then if they would like to gather some traditional knowledge and land use information, we are certainly happy to talk about how we can support that through our Participant Funding Program as well.

So there are lots of different options on the table and we are going to tailor it to each community, but it is something we really look forward to collaborating with them on, moving forward. Thank you.

MS SAUVÉ: Kiza Sauvé, for the record.

So what we are hearing from Mr. Levine is the moving forward part. I would like to note that in the past we have reached out and in fact in 2015 we were speaking with Curve Lake First Nation about them doing their own sampling program and using the Participant

Funding Program. The decision was made not to go ahead with it for various reasons, their decision, but we have been in discussions with them and it is, like Mr. Levine said, a very important part of the program.

In fact, this year we have been backing up when we reach out to indigenous communities and in this year's letters and discussions we have made a stronger tentative plan for next year's sites for 2021, so we can even start talking about those. So we are really trying to back it up as much as we can to really get those meaningful engagements.

THE PRESIDENT: Dr. Demeter...?

MR. LEVINE: Sorry.

THE PRESIDENT: Mr. Levine...?

MR. LEVINE: I'm sorry. Just one last thing on that.

Since Chief Reg is here, I am really glad that he's here from Mississauga Nation which is near Blind River, Ontario, and we have actually some great examples of how we have collaborated with indigenous communities directly on sampling.

For a number of years now we have collaborated with his community on putting up air sampling

on a playground which is in close proximity to the Blind River Refinery, Cameco's facility, and I talk to them regularly about sampling and we continue to do so. So we do have some great examples from across the country on collaborations with indigenous communities on sampling.

THE PRESIDENT: Thank you.

Dr. Demeter...?

MEMBER DEMETER: Thank you very much for sharing your presentation and position with us.

One of the things I would like to understand, understanding the journey of how you got the information and the difference between the BWXT and CNSC's sharing of information, but taking that all into account, can you give me some examples, based on your assessment of information you do have, of what are the potential impacts to you in a practical way? Based on the information you have received, there's all kind of theoretical stuff, but on the ground, what do you see as the significant impacts on your way of life and your peoples?

CHIEF WHETUNG: I think that's the basis of our presentation, is that we don't know that. We don't know that because we don't have information. We don't have the supports to interpret the information that was provided

in the last month. So the reason we are here is because there are potential impacts, but the extent and the significance of those impacts is unclear.

MEMBER DEMETER: Okay. Thank you.

THE PRESIDENT: Again, miigwech. Thank you so much for your submission today. Any final comments?

CHIEF NIGANOBE: (Aboriginal language spoken.)

For the record, Reg Niganobe, Mississauga First Nation.

I keep hearing requests about what is meaningful consultation or what does that mean. I think to go forward you have to kind of look back at the Treaty of Niagara in 1764. It was the British that came to us as First Nations people to make an agreement, but in that agreement, prior to all that, they sat in ceremony, they feasted with us, they had a good understanding of who they were dealing with. And they spent days there and they took as much time as was needed to have the discussion and understand and iron out exactly what everybody was getting and what everybody was agreeing to.

I think that needs to be returned to that basis. I think you need to, not only yourselves but inform

industry that that's what they need to do to develop a relationship, because that is exactly what this is at the end of the day, it's a relationship with each other. Your processes are quite different from ours. At the end of the day, although we are Chiefs and we will sign the final documents or whatever it may be, it's still a collective community-informed decision. It's a majority that comes to that decision, not just us as Chiefs in general. We are merely the speakers for our communities, not the actual de facto decision-makers. Miigwech.

THE PRESIDENT: Thank you.

CHIEF WHETUNG: I also want to take a moment to clarify the distinction between stakeholders and proponents and constitutionally protected rights holders. I think that is significant in terms of your considerations. And ultimately, the duty to consult rests with the Crown. So while you can delegate some conversations in that to the proponent BWXT, it is our relationship with the Crown that is important. So just a reminder of that in our closing remarks. Miigwech.

CHIEF CARR: Given what I have heard over today and the last couple of days, it has become clear that there are more studies that need to be done and of course,

as we have noted, the meaningful and substantial consultation. I just want to reiterate that we cannot agree to the conclusion that there will not be any adverse impacts to any potential or established indigenous or Treaty rights because we do not know that yet.

We do have -- and I want to leave with this quote, that:

"We do have the inherent responsibility to protect our lands and waters. We need to treat the Mother well as she was not given to us by our parents. Rather, she was loaned to us by our children, all of our children, all of our seven generations."

(As read)

Miigwech. And miigwech to you, the Members of the Commission.

THE PRESIDENT: The next presentation is by Mr. Dan Rudka, as outlined in CMD 20-H2.17.

Mr. Rudka, the floor is yours.

CMD 20-H2.17

Oral presentation by Dan Rudka

MR. RUDKA: I'd like to thank the Members of the board, Madam President, for accepting me today.

I'm going to discuss the points of my intervention that was presented to you earlier.

One of my first concerns is worker safety and protection at BWXT and that of the public. I'm an exposure victim out of Port Hope. I'm a former nuclear energy worker. I have been tested positive by UMRC, Uranium Medical Research Centre. And some of the testing -- it has been peer-reviewed; it's been accepted -- I will the damages have been ignored -- but some of the concern of what goes in these plants, the testing included U-236 found in my body, which is spent reactor fuel. The company at the time had no right to deal with that. So you got to wonder what's going to happen in the future here after this now.

I've lost both lungs to uranium, severe bone damage, blood issues, kidneys losing function, sinus, obvious facial damage, and bone deterioration. I heard about the arm and the hand damage to the GE people in

Toronto. I have that too, but for some reason mine won't be recognized, has not been for 20 years.

Now, this is my overall concern is with the health of the workers. I'm just going to give you an example of how exposure is handled from your direction initially. The CNSC years ago told me to work with the WSIB. And I've spent years of effort with the WSIB. I've been denied, I've been refused, I've appealed. I've sent in 600 pages, hundreds of hours of work, evidence of proof, hours of telephone interviews. And a decision was about to be accepted this year. Then I was contacted indirectly, last minute. The adjudicator on the claim was retiring effective immediately. She could not see my claim through, and that was the end of contact. Now, from there on I spent a half a dozen calls or more to supervisors, administrators. And as predicted, in four to six weeks, with not one returned call, I was called and told that my claim was denied.

Now, WSIB adjudicator broke down and admitted when asked extensively and with a witness, that she did not read the entire file. She explained the decision was based on her not believing me and the doctor's comparison study of my exposure based on rodents from 1977.

He found no connection.

Excuse me, but I'm not a damn rodent. That pissed me right off. Excuse me again. And the year is 2020.

Now, these were excuses. Someone within WSIB, the company or others conspired to prevent this claim from being accepted.

Now, also consider that it's been noted on 90-odd per cent of the CNSC staff have seen some political or other source of interference within CNSC and about the same average apparently have requested a better whistle-blower program. Now, it appears the CNSC as a whole that needs to be investigated here.

It is how we take care of the nuclear workers, and this is how we're doing it. What about outside the fence? If you can't take care of me from inside the fence, how are you supposed to take care of these people outside the fence?

Now, what if today I came from BWXT, sat down in front of you, and said, I've been tested, I've been exposed. What action would the CNSC take? Now we know referring to WSIB doesn't work.

Now, the workers at both the BWXT plants

have no idea what to expect from the WSIB or CNSC. The equipment used presently is decades old. Okay, it's the same equipment that I used and the testing for exposure hasn't changed since my testing. For example, the low monocytes that affect hemoglobin in 44 per cent of the GE workers. An exposure indicator, low hemoglobin is not accounted for in testing for workers now, is it? It's not. Everybody goes by urinalysis test. It's very, very not in-depth ones. Now, has anyone ever followed these workers from GE afterwards in their latter years to see what's happened to them? And the public?

Well, no one is protected from possible exposure, because we deny that exposure is a problem. It's based on little more than the fact that we can get away with saying that other ailments from low blood to lung disease on to cancer are all caused by something else.

Now, in a recent letter to the *Peterborough Examiner*, the president and CEO of the Canadian Nuclear Association claimed the numbers of deaths since 1950 is zero. I would suggest that is only by the virtue of a life-saving double-lung transplant that I did not become the first death.

This is an insult to exposure victims.

Okay? I'm reminded of a friend who tested of exposure with me that I sat with while he passed from bone cancer. And then there are other things over the years, like the poor gentleman that went to his death, suicide, at Eldorado long ago over his health. The history of nuclear deaths are far-reaching beyond the plant exposures but excluded from the public.

Zero deaths are attributed to the fact that no one wins a nuclear exposure compensation claim with the WSIB. Many die from cancers, other issues that we cannot be sure are not related to nuclear emissions, airborne contamination, and latency periods. Since nuclear, there has been an increase to cancers, more rare diseases -- as in my diagnosis; it's one of the rarest in the world -- making it hard to connect to nuclear without extensive testing and medical research. And we are still learning of the potential damage to health and beyond from nuclear exposures.

Now, I ask you to consider the local children and youth. I'll explain there are too many cases of attention deficit disorder, blood cancers, tumours, autism -- one third of students now need special education -- just a few of the rapidly increasing issues

around health with answers as to a direct cause.

We are strongly bombarded with the mindset that CNSC and the industry -- that they're safe. It's all safe. Local emissions are harmless, if even notable, by the calculations and numbers thrown at us. But those are irrelevant when it comes into inhalation exposures, because 200 times more dangerous to the body than any other method of exposure is inhalation.

Any particulate inhaled -- the smaller the more dangerous, and with your filter systems, they're going to be very small, what's getting through -- goes into the lungs, gets embedded deep into the alveoli where it will remain. It also messes up your immune system immensely. It's especially so when the particle is insoluble. The particles go up through the nostrils, okay, through the sinus, through the olfactory, and into the brain -- and also nobody's considering this; everybody's talking lungs -- causing whatever damage, and it remains embedded as in insoluble.

The CNSC staff through all considerations feel that this is acceptable and will not affect mothers-to-be, unborn, developing youth, our future? And how does this Board, the Members, personally feel about

this? As parents, whatever, how do you feel?

Now, in December I took a dosimeter reading at the BWXT plant in Peterborough.

Now, before I go into this stuff, I just want to mention something. I did not get into much about beryllium, but you need to know -- nobody's brought this up -- that the beryllium factor, if you want to get tested for beryllium or berylliosis, it has a 50 per cent negative on the negative factor. Basically -- I'm trying to say this right -- it can show a negative on a positive indication. You can get a positive test that comes back negative. You can't read it. Two times out of one, it'll come back as a negative test, even if you had berylliosis. Now, I've been tested twice, and I come back negative. But we still don't know that berylliosis is not my problem.

Now, I took dosimeter readings at Peterborough plant. First dosimeter reading was somewhat elevated, but it took within acceptable limits, okay. Two hours later, the same location, the reading was still acceptable but elevated three times the original reading. Detectable airborne emissions are coming from that plant.

Now, they fall within the public domain and the pelleting upgrading and an open future of this

possibility would -- you know, the probability of BWXT -- I think it's definitely all in the plans; it's been there for years -- will increase the emissions and increase the risk.

Now, years ago at the CNSC hearing in Port Hope it was acknowledged that a facility's Cameco operations, including powder and pellet making, would never in the future in this day be allowed in the middle of a town. But now in Peterborough, CNSC staff have proved that this can be done.

Is this the next town to be sacrificed to nuclear? Has no one at the CNSC learned from Port Hope's history the sacrifice of that town from nuclear industry to nuclear dump? The split in that community, the ongoing issues that divides the town's population and unfairly defines it? Overwhelmingly so, too.

It is the nuclear industry's influence here. The invitation to do it again is beyond reasoning and, you know, beyond the past considerations of anything. Have we learned anything in the past from this?

Now, I want to consider something else, the psychological effects of invisible trauma. It's attached to my intervention. Now, these fall into effect when a person or population are exposed or suspected of

exposure. There are 12 categories of invisible trauma: uncertainty -- and I live with them all.

To ask a population to live in the proximity of a nuclear facility that will release this trauma over time, especially right now with the increasing knowledge of the health risks as you've seen in this town, this is unreasonable, and not a CNSC concern at this point, but it should be. Because this is mental health, and still, it's still health. All health's got to be protected.

Now, the trauma exists in Port Hope. It's silent, unspoken, most often denied. It also lives around every nuclear power plant and other nuclear facility, also silent in the unsettled minds of parents. This is a social disaster in its own right, breaking the peace of mind, decimating the comfort and safety and protection of the local population.

And the CNSC proposes to allow this to continue, at the same time take the public voice away for 10 years? You're not representing the public. You're representing the industry. That was to be a question, but really, that's what we're seeing.

Now, in my opinion, the Canadian Nuclear

Safety Commission has lost its way. It's too occupied supporting, promoting, and selling nuclear rather than regulating here. Because this is seen in a recent venture to the US by Madam Chair to promote small reactors. And now acting chair for the IAEA, as you are, I congratulate you, but respectfully, I would prefer that you're working on Canada for Canadians first and foremost.

We need work on methods to test the public for inhalation and external exposures. We need a policy where nuclear energy workers have consideration for certain types of exposure and related injury, as do firefighters.

I just want to make sure I have the Board's attention, if you don't mind. There's discussion going on.

Okay, thank you. I'll continue.

Now, the only assistance that I have received has been more from the public tax pool, and my medical costs about \$2 million or more. It should be industry- and WSIB-covered.

But imagine the cost if there was an accident involving the public and workers? How many victims would it take if that notion turned real to get your real, undivided attention?

I honestly have no choice but to believe that CNSC does not have the best interest of the people in its mind, that safety and health appears to be second to the safety of the industry's existence. The CNSC appears to just want to sell and promote nuclear, this new plan for small reactors, SMRs, being promoted, pushed. But hardly anybody in the public's hearing about this.

Now, CNSC has health secondary. You have no health department. We know that the IAEA has to clear all nuclear-related medical information from the World Health Organization before any public releases. I expect the CNSC is under the -- has the same collar around its neck, as would Health Canada.

The CNSC's regulator is a regulator of the nuclear industry acting on behalf of the people of Canada. The people, their health, well-being are expected as priority. You have a population that has a priority concern for health and safety and their children, themselves, their friends, and this community. With the school across the road, bad planning from years ago, this can be reversed at this time. And this is the time to do just that, not add production.

Now, some recommendations.

I see I've run over my time. Would I be allowed to continue?

THE PRESIDENT: Yeah, you can wrap it up in 30 seconds --

MR. RUDKA: Okay, I'll try --

THE PRESIDENT: -- Mr. Rudka, please.

MR. RUDKA: -- to nail on some of my most important ones. Okay.

Before you go forward, resolve the beryllium issue before any licensing goes. Where is it coming from? What's going on there?

Licensing between Toronto and Peterborough should be separate. This is not a good combination.

A two-year licence period maximum. And that is in consideration of transferring the BWXT pelleting operation to Peterborough should not be done. And in this two-year maximum, the CNSC should be licensing short term so that BWXT and the CNSC can explore options to relocate both plants out of Toronto, out of Peterborough. Just out of town in a good area. People can travel to that.

Okay, and I want the CNSC -- we always have to work on nuclear exposure testing for levels for workers, as I said, a special situation for workers,

special indications for you know special problems with health that'll evolve with nuclear.

And I'd also request an independent health advisory group be implemented to explore nuclear industry within Canada, its health effects, known to the unknown, and discover more about what we need to understand. This is still a new industry, 75 years, you know, I mean we've moved along pretty quick.

And again, you know, doing anything extensive, a 10-year licence is ridiculous, the way the technology is moving so fast, so quick each year. And you want to give a 10-year expanse to let whatever? No, I don't buy that.

I'm also asking the federal Minister of Health Patty Hajdu and the Honourable Katherine McKenna, the Minister of the Environment, to be supported by the CNSC Board and investigate the industry relations, directions, intention, because there's reason for doubt. I've seen too much of it, and there's nobody in between.

I have a comment in closing that I will leave. It's not very -- it's maybe a little more condemning. I'll leave it to the Board to read personally, because I've run out of my time.

But I'm here to tell you that between all the naysayers that people do not get sick from this stuff, they do. They get terribly sick. The reason I'm here, because of all the people tested, I'm the only one capable of being here. Others are incapable or they're dead. They're gone. I've seen too many deaths after the fact or too many rumours.

I know Port Hope well, inside out. I've been doing this for 20 years, longer than some of you people have. I know what I'm talking about. I've watched careers come and go. And my only good fortune is to still be here, but it's a misfortune to this industry, because there's few and far between people like me. But we are out there.

And I know that inhalation of this is jeopardizing the public and the children; it's causing other diseases. Because I've had far more time. You've turned my life from a simple family man into a dedicated effort to prevent nuclear contamination exposure to people because we do not know what it's doing to our population. But I know from watching Port Hope, knowing Peterborough -- it's been my backyard for years.

You've got to take consideration. You

people on the Board are the strongest. You said the buck stops here. Well, stop it here. But take a look back. Look at what has not been done. And for God sakes, do something to recognize people like me. This is ridiculous, what I've gone through.

I don't want to be here today. I'm tired of this stuff with you people. Because you know something? Even everything I say today, I can take this, throw it across the room. It means nothing, because nothing will be accomplished.

And I will still continue to fight my WSIB claim, wrongly so.

So thank you very much for your time. I think you've been an excellent group through the hearings. I've been watching. I've liked some of the CNSC responses.

And I got to commend all the intervenors, because the hours of work that they have put into this, you must understand, they know what they're talking about now, maybe more so than you people. So thank you again.

THE PRESIDENT: Thank you, Mr. Rudka.

--- Applause / Applaudissements

THE PRESIDENT: Dr. Lacroix?

MEMBER LACROIX: Thank you, Mr. Rudka, for

your intervention.

BWXT, how do you make sure that the health and the safety of your staff are protected?

MR. SNOPEK: Dave Snopek, for the record.

Health and safety at both of our facilities is governed by the programs that we have in place at both of the facilities. It covers conventional health and safety. It covers chemical safety and radiation protection.

We have in place at both of the facilities workplace safety committees. We have a policy committee as well. We have specialist committees called the ALARA committee, or the as low as reasonably achievable committee, which looks at and reviews radiation protection at the facility. We have a beryllium safety committee which does the same thing for beryllium.

So we have worker engagement in all of these committees, representatives from both management and the workers, in looking at general safety and looking at radiation protection and looking at beryllium exposure. And they make recommendations. They review data. They provide advice and add value to the improvement of our program over time.

And we do have a very strong program. We're continuously improving that program. We're continuously looking at that program from an audit perspective, from a self-assessment perspective. And that's very important to identify issues as they come up to identify trends.

They also have a management meeting on an annual basis that looks at those things specifically. You know, when we're going through the year, we have individual things that come up. The management meeting is intended to look at the year as a whole. Do we see trends? Do we see things that we need to adjust in our management system? And we have that opportunity at that annual meeting.

So we have strong programs in place at all of our facilities to look very broadly at all of the aspects of health and safety.

MEMBER LACROIX: Thank you.

THE PRESIDENT: How do you measure the uptake, if any, or confirm that there's been no uptake of beryllium by your staff?

MR. SNOPEK: Dave Snopek, for the record. We have a medical monitoring program that's in place for all of our beryllium workers. So like

we have classified nuclear energy workers, we classify beryllium workers as well. And those personnel that work in the beryllium area are classified.

And as part of that classification, there's incoming medical consultation and examination as well as ongoing medical review which includes beryllium testing. And it's a test called the beryllium lymphocyte proliferation test. So all beryllium workers are monitored using that test, depending on the area that they work, either it's an annual test or it's a triannual test.

THE PRESIDENT: And so in your CMD I don't believe I saw any results of what those tests may have indicated. Do you get any positive indication from that?

MR. SNOPEK: Dave Snopek, for the record.

We have many, many tests. If there -- we've had in the -- that I'm aware of, there's been two sensitizations over the period that I'm aware of in that test, that both happened some time ago. So we have no current sensitizations.

And sensitization is the -- and the reason we do the test, it's an early indicator that with sensitization it's not a disease. It's an allergic reaction that's a predecessor to potential disease. So we

want to identify that early. And the course of action then is to remove that person from further potential beryllium exposure. So we don't have anybody in that class right now.

THE PRESIDENT: Many intervenors have made reference to the documentary *City [sic] of Widows*. And as I watched that, very early on one of the persons in the documentary refers to the beryllium room as the "room of death," I think, or something very alarming.

Has that been a long-standing concern? I know we're going to have some of your workers come later and we can ask them about it, but do you hear concerns about potential exposure to that?

MR. SNOPEK: Dave Snopek, for the record. And Ted Richardson may want to add after I make a few comments.

The beryllium room, which is where we do the coating operation, is a small part of the facility. It is a contained room that's small. It's less than about 500 square feet.

And a small number of workers go in there periodically to load material into the coater and to remove material from the coater. Those people while they're in

there have personal protective equipment on, including full-face respirators.

The people that work in there are involved in beryllium safety. There's an open means of communication for raising issues in our business, and I'm not aware that there are issues that have been raised by the people that work in that area day-in and day-out.

And again, if Ted Richardson wants to comment, please do so.

MR. RICHARDSON: Ted Richardson, for the record.

One comment that I'd make, I've been with the company for just about 18 years, and so I was a manager on that shop floor before I got into the role I was in. And managing people that go into that area, one of the things that I did as a practice is took volunteers that wanted to go in. And we've always had volunteers that wanted to go into that area.

And we have a robust training program for that, as I mentioned in Toronto, which might be beneficial for this meeting and some of the comments we might have heard from our competitors, but we really value training.

We have the employees that have been

involved in that training program and we involve our EHS team, our quality team, the engineers in that area, the trainer who all has a say on how that individual trainee is moving through the training system. And the trainee is never asked to work alone until they're comfortable that they even want to be audited.

So they have to go through an audit process, be qualified and -- before they go in there.

And again, I would indicate that all of the people that have been in that area, in that process are people that wanted to be or people that have volunteered to go into that area, so it's not as I think perceived.

THE PRESIDENT: Thank you. Thank you for that.

Dr. McKinnon?

MEMBER MCKINNON: Yes, thank you. I have some questions.

We've discussed safety culture a little bit in the past and we talked earlier this morning about the Joint Health and Safety Committee as one of the mechanisms of giving feedback for any concerns. But one point that Mr. Rudka brought up was whistleblower.

So do you have any means of workers being

able to give feedback anonymously?

MR. MacQUARRIE: It's John MacQuarrie, for the record.

Yes, we do. So we have different mechanisms for providing anonymous feedback.

There is email means of doing that, there's telephone. If you go into any of our facilities, there's posters on the walls of the facility that explain exactly how to do that.

That's monitored by an independent group. In fact, they're not even based in Canada. They're based in another location so they're not -- there's no relationship between those people and management here.

And then those are dealt with by an executive committee of our company that looks at fixing compliance issues and monitors those issues as they're reported.

MEMBER MCKINNON: Thank you.

And we heard also about the beryllium testing that you do, but I was a bit alarmed to hear that there's a very potentially, you know, high false negative rate for those tests.

Could CNSC Staff talk about the nature of

the test and its reliability and what you do do in a situation if the testing has such ambiguity?

MR. McALLISTER: Andrew McAllister, Director of the Environmental Risk Assessment Division.

I will ask, I believe, Dr. Hemendra Mulye from the Environmental Risk Assessment Division, in headquarters, and he might be able to provide a bit more information regarding this test and its reliability and other aspects.

DR. MULYE: Yes. It's a very specific and highly accurate test that is done basically to look at the sensitization of unusual exposure to beryllium.

So essentially, it's an indication that one has been exposed but there's been an immediate reaction. And so by the very nature of the test, it is very accurate and there's very little in the way of ambiguity or false negatives.

It's a test that's widely used. It's highly recognized. It's also routinely used in the U.S. and other countries as well.

THE PRESIDENT: Dr. Demeter.

MEMBER DEMETER: Thank you very much. I hear your frustration and I can't presume to walk in your

shoes to understand your journey, but I thank you for sharing that.

I wanted to ask BWXT whether there are -- what is the status of the number of WSID claims, if you'd know that. I'm not sure if -- and how many have gone through, how many have been rejected.

I don't know if you have that kind of information that you'd share.

MR. MacQUARRIE: It's John MacQuarrie, for the record.

So I assume you're referring specifically to beryllium-related claims?

MEMBER DEMETER: Your operations in general between the two sites.

MR. MacQUARRIE: For beryllium and uranium or for -- just in general for all forms of the ---

MEMBER DEMETER: Beryllium and uranium.

MR. MacQUARRIE: Okay. So thanks for that clarification.

We're not aware of any claims related to either beryllium or uranium in our business. We acquired the business in late 2016, so anything that happened before that date, we don't have any records for that. That's

General Electric.

MEMBER DEMETER: And just to follow up on the beryllium testing and understanding the false -- the potential for false negative results which I believe are between 30 and 50 percent, so intervenor talked about 50 percent, can you give me a little bit more granularity that when an individual is being monitored who works in the beryllium room, what else may be done to medical monitor them in addition to the beryllium lymphocyte test?

MR. SNOPEK: Dave Snopek, for the record.

As I mentioned, there's an incoming medical consultation. We have an occupational health nurse that's on staff located in Peterborough and she works under the direction of a medical doctor.

So there's an incoming medical examination and discussion that takes place upon entry. There's pulmonary function testing that's done as well as other tests I don't have immediately in front of me.

MEMBER DEMETER: Yeah, so I know the answer. That's why I'm asking the question, so -- but I didn't want to submit it.

So my understanding is that the occupational monitoring, medical monitoring for beryllium

workers is more than that one blood test, but it includes a medical -- a general medical assessment, like you said, pulmonary function tests and probably chest radiographs, but that's a bit broader than a single blood test.

MR. SNOPEK: Dave Snopek, for the record.

Yes, that's correct.

MEMBER DEMETER: Thank you.

MR. SNOPEK: And it's periodic as well.

THE PRESIDENT: Dr. Berube.

MEMBER BERUBE: So first of all, I want to thank the intervenor for the presentation. It's very articulate, and thank you for sharing your history and the frustrations you've had along the path and certainly your fight is one that you have to fight, obviously.

As -- it speaks very loudly to occupational health and safety across the board, so I'm going to back off this discussion just a bit and look at the occupational health and safety at BWXT.

If you can tell me what your procedures look like if an accident does occur on either one of your sites. What do you? What's your follow-up action? How do you actually remediate and rectify a situation like that?

MR. SNOPEK: Dave Snopek, for the record.

Just a clarification in terms of, for example, if we have an injury?

Okay. Thank you for that clarification.

So all injuries are required to be reported when they occur. There's an immediate response by our EHS team depending on the severity of the injury or the illness. For example, it could be a heart attack.

We have an emergency response team in Peterborough. We have a similar team in Toronto that gets activated.

And the emergency response team consists of people that are trained in first aid. I mentioned in Peterborough we have an occupational health nurse who's part of that response with that team to provide medical aid to the person, which is the primary consideration.

The other aspects of the response, I'm thinking injury, but this could be other things like spills, so the scene would be assessed. The very first thing, is it safe for the response team to go into.

So if it's a spill of material, that needs to be assessed before any action can be taken. If it's an injury of the person, it's the same thing.

At that point, the emergency response team

enters and starts to -- whether it's first aid, whether it's spill containment, starts to respond to whatever the emergency is.

In the case of some types of injuries, for example, the scene may need to be secured. There may be reporting that needs to happen.

That reporting could include to the CNSC, to ESDC as well, to the MOE, so reporting is part of that as well.

THE PRESIDENT: Mr. Rudka, any closing comments?

MR. RUDKA: Yes, if I may. Thank you.

The ---

THE PRESIDENT: And do please keep it short, okay.

MR. RUDKA: Oh, yes. I'll try very much. You've been most generous.

Just on the beryllium testing, when you pick up sensitivities, you've been contaminated, bottom line, okay. I'll just leave that at that.

I want to send you home with something, though, for the CNSC Staff. Now, I explained to you what I'd gone through with the WSIB meeting and the four to six

period -- week period where nobody was in touch with me because people were discussing things.

I want you to know that we discovered during that period that the CNSC administration staff started to investigate me. And in that period of investigating me, my claim was dropped.

Now, I know what's happened here. You can sit and suspect if you want. But this is the kind of thing that's happening in the disconnect.

There is something between the CNSC Staff, the industry, the politicians and WSIB to make sure that we don't get cleared. And that's a crime, and that's what's been happening, covering crime.

So I want you to take that home to your CNSC Staff, Madam Chair. That's why I want you working here more.

There's a lot going on below that you people do not see, and I could have taken this intervention in so many different directions, and that's the problem.

Now, I want to make one last offer to you. I've offered years ago, Mr. Leblanc will remember, I sent a letter in offering to come to Ottawa on my own account, my own expense. I don't care how many days it takes, to talk

to the CNSC Staff, to you Board Members about -- extensively about contamination, what it does, what's being covered up, what I see, what I know. And what they're trying to do is prevent me from coming forward.

I'm opening that door for you one last time. The last time I opened that door to you, the letter was sent, it never made it to the Board, I understand.

So here again, there's a conflict there because the communication is not clear.

I ask you to accept my invitation because you do not understand, once you are contaminated, life changes. I had half a normal life. I do not feel like a human being any more. I can't describe that to you in the words that I want to.

But to ask children to start a life that way, just reminds me of Hitlerism. It's ridiculous. It's mad.

So please consider that.

This generation may be lost. I am, definitely, to this whole mess. Don't do it to our kids.

Thank you very much for your time, your consideration and your indulgence.

THE PRESIDENT: Thank you. Thank you for

your submission.

Our next presentation is by Mr. Jason Rogers as outlined in CMD 20-H2.175.

Mr. Rogers, the floor is yours.

CMD 20-H2.175

Oral presentation by Jason Rogers

MR. ROGERS: President Velshi and Members of the Commission, good afternoon. My name is Jason Rogers, and I work for BWXT Nuclear Energy Canada at the Peterborough facility.

I am a member of Unifor Local 524. I am a family man with two young children. BWXT provides a good pay and benefits to support my family.

I have worked for BWXT in Peterborough for over 13 years in a variety of roles. My current title at the company is Nuclear Fuel Operator. My duties include punch press, tack and brace, cut to length, enclosure welding, helium leak testing, rework operator and material handling.

As I mentioned earlier, I'm a member of Unifor Local 524 and I am a former union steward. I am

also a member of the Health and Safety Policy Committee.

My role on the committee includes round table discussions involving keeping the language of all safety policies up to date across three sites.

I have seen firsthand the continuous training and safety upgrades BWXT has made at these sites.

When I joined nuclear, I was provided with a company overview and an environment health and safety presentation along with a test. I perform routine and continuous training for my role and I'm required to wear personal protective equipment.

During work, I wear a smock, ear plugs, safety glasses, safety shoes and hand protection. I am also required to wear a thermoluminescent dosimeter (TLD) badge. This measures my radiation dose and, quarterly, I have to wear TLD rings to measure my extremity dose.

I also do urine sampling quarterly, all of which is a part of our health and safety programs.

Although this part of the process is not what we do at BWXT, I wanted to mention that I have seen firsthand the process for uranium mining and refinery in Saskatchewan. I've been to the pelleting plant in Toronto and I work in the Peterborough site where we assemble fuel

bundles.

No part of these processes make me feel unsafe. I've watched the air monitoring, floor and equipment site -- sorry, floor and equipment swipes and the safety protection for employees.

When I go to work, I feel my work environment is safe. On top of the safety training that BWXT provides for me, I have also been educated by Dave Shier and Bob Walker of the CNWC at their yearly unionized conference.

If only we were all so fortunate to be able to attend such well-informed meetings.

One last point I would like to add, in my 13 years, 18 babies were born to the employees on the floor, two for myself. Those were 18 healthy babies, no birth defects.

I am a proud -- I am proud to work in the nuclear industry, and I see firsthand the emphasis of safety day to day.

Thank you.

THE PRESIDENT: Thank you for your submission, Mr. Rogers.

Dr. McKinnon.

MEMBER MCKINNON: Thank you for your comments. They're extremely opposite from the intervenor we just heard, and this has occurred a few times.

So being a former union steward and hearing the opinion of many of the members, what advice -- do you have any of the members who are initially very sceptical who then become quite -- you know, all their fears would be allayed?

What, if anything, would assure people the most, in your opinion?

MR. ROGERS: When I went to the CNWC conferences, they are filled with many bright people in the industry. And when I had discussions with them on the side about my own personal concerns, they assured me that it's just not going to happen.

As far as work goes, I don't hear people on the floor showing their concerns with the questions I asked when I go to these conferences, but everything I believe at work with the employees, they've got the safety and they do the job well.

MEMBER MCKINNON: We heard many people say they will just not believe, you know, this sort of information. What earned your trust and what earns the

trust of other workers?

MR. ROGERS: When we get our results from our urinalysis, our testing and the dosimeters, the TLDs, they all fall within range. They give us our quarterly updates and then they give us our yearly updates and then total, so we see the progression from start to finish. And they are well within our own personal limits, which I believe are more tighter than what the industry allows.

So I have -- just following our testing results, there is no issues with my thought process if it's safe or not safe.

If we're at work and we're behaving poorly in an unsafe manner, people speak up around you and they correct you and they let us know that this is not the right place to behave inappropriately where, unfortunately, some things may happen, whether it's a contamination with the product, inhalation. Things can happen, but we are -- we do our best not to.

THE PRESIDENT: Dr. Demeter.

MEMBER DEMETER: Thank you for your presentation.

I wanted to get a sense -- you're on the occupational health and safety committee?

Policy. Okay.

So I want to get a sense of what happens in that meeting if you have a strong recommendation to your employer? And maybe you can give us an example of such a recommendation, how it was handled, in general how they're handled and maybe an example.

MR. ROGERS: When I first joined the committee, at the time we were sending an employee back and forth between Toronto and Peterborough. Our current discussion was on the lock-out, tag-out system and it was discovered that across the three sites, our colour-coded system for tags and lock-outs were different amongst three sites.

So the concern was raised, we had an employee travelling between two sites and far too easy a mistake could have been made. And it was dealt with immediately, addressed properly and the situation changed for the better. And now we have one system across three sites, and I believe they're all on the same page.

MEMBER DEMETER: Okay. And so that's a good example.

In all unionized environment there's the potential for disagreement between union and management.

Do you have a sense of what the grievance volume is for disagreements on safety issues?

Are there outstanding grievances that you know of?

MR. ROGERS: When I was a union steward, I handled zero grievances for safety. It was not an issue.

And as far as being on the policy committee -- and I'm no longer a steward. I'm just not up on the current status of that situation.

MEMBER DEMETER: Okay. Maybe BWXT can answer that question.

MR. RICHARDSON: Ted Richardson, for the record.

That's a very good question. When it comes to grievances around EHS concerns, I'm not aware of any that are out there. There's a lot of dialogue and maybe I'd just point attention to the program we do have at all of our three sites.

Employees can raise concerns in many fashions. In fact, at our two sites, Peterborough and Toronto, it's as easy as entering a concern right at the workstation they work at.

So if they're working away and have

something that comes to their mind, they can actually input that right away so it can be dealt with and they get logged into a system where it gets tracked and they get followed up with the right team that would address those issues.

And when it doesn't get resolved beyond there, meaning it's a longer-term concern, they put in an action traction system. So these concerns that employees raise are tracked till completion.

So there's a great participation between the employees and management as well as the staff on issues that employees raise.

So I know I gave you a long answer there. I'm not aware of any current grievance regarding EHS issues.

MEMBER DEMETER: Okay. Thank you very much.

THE PRESIDENT: Dr. Berube,

MEMBER BERUBE: Well, thank you for coming and speaking to us and sharing your observations.

I'm very curious as to your perceptions of safety meetings and safety training in general at BWXT. Could you give us your impressions of what that feels like or what that looks like?

MR. ROGERS: Weekly, we sit down and we have an update on current situations in the business. And every meeting starts off with a two-minute, five-minute safety talk. And we're all over the board.

If it's the winter, it can vary as to driving in the snow or hand protection at work. There's no limit to our discussions of safety and basically every meeting, safety is discussed.

MEMBER BERUBE: And are you satisfied with the outcome of these safety meetings in terms of the things that you're worried about are being addressed in an expeditious way, in a way that satisfies people's requirements?

MR. ROGERS: Yes, I have no issues at all with how we handle our discussions at work and the outcomes.

People on the floor are vocal and relentless at getting the issue out there until it is resolved.

THE PRESIDENT: Dr. Lacroix.

MEMBER LACROIX: Thank you very much, Mr. Rogers, for your intervention. It's -- finally we have someone who's got hands on the device that are being

manufactured in the company, so for once I will not have the opinion of the upper management, nor from the public, but from someone who knows his stuff.

So I've got two questions for you, one general and one technical.

The general question is that are you surprised at the sudden opposition of the public to the licence renewal of BWXT?

MR. ROGERS: No, I am not surprised. I think many people are misinformed.

I'm going to say safety upgrades over the years, 30, 40 years ago are probably quite different than how we handle things today. I -- no, I don't see any problems.

MEMBER LACROIX: And my second question is mostly technical and I would like BWXT to -- do you still have the slide where we see the fuel bundle with the end caps and the end plates in your presentation? Because I want to take -- yeah, this one. Yeah.

Now, Mr. Rogers, you'll explain to me what is the difference between brazing, welding and tacking, and which part is tack braze and welded on the fuel bundle the end caps and the appendages?

MR. ROGERS: Okay. Tack and brazed is a combined job task. The first jobs that is done is the tubes are tacked with elements and then it goes into the ovens where the beryllium is heated --

MEMBER LACROIX: Okay.

MR. ROGERS: -- 1,000 degrees and it's -- it just melts on and forms a strong seal.

MEMBER LACROIX: Is it done by hand? Is it done by machine?

MR. ROGERS: No, no, no, no. It's done by machine.

MEMBER LACROIX: Okay.

MR. ROGERS: Conveyor. You only get to watch from the outside through glass. You don't get to touch it or be hands on with this one.

MEMBER LACROIX: Okay, okay.

MR. ROGERS: I'm sorry. Now what was the follow-up; the welding?

MEMBER LACROIX: Well, yeah, the welding.

MR. ROGERS: So in the welding area, the elements are assembled. The uranium is inserted into the sheath and then they are sent down the line where they are helium back-filled.

MEMBER LACROIX: Okay.

MR. ROGERS: The end cap gets welded on one end. More helium gets added just as long in the process some does leak out. And then it goes through a weigh scale to make sure all the pellets and all components to the element are on.

MEMBER LACROIX: Okay.

MR. ROGERS: And then we send it through. We build it into that round bundle which you see, and then it gets sent through.

With the end plates, that is in the next procedure in the welder where it gets welded with the plates to each individual element.

MEMBER LACROIX: And it's still done by a machine?

MR. ROGERS: This is all done by machine.

MEMBER LACROIX: Okay. Yeah, okay. I understand. That's great.

Thank you very much. I really appreciate that.

Oh, one final question. The helium that is inserted into the tube, is it pressurized? Is it under pressure?

MR. ROGERS: Gee, I'm not following you. I'm not too sure.

MEMBER LACROIX: Okay.

MR. ROGERS: I'm going to say yes because we need to test for leaks. I'm going to say yes, but I really don't know.

I'm sorry I can't give you a clear answer on that one.

MEMBER LACROIX: That's all right. Okay. Thank you. I appreciate it.

THE PRESIDENT: Mr. Rogers, do you live in Peterborough?

MR. ROGERS: I am currently living in Lindsay.

THE PRESIDENT: I'm sorry. You live in?

MR. ROGERS: I currently live in Lindsay.

THE PRESIDENT: Lindsay.

MR. ROGERS: Yes.

THE PRESIDENT: Okay. I just wondered if your neighbours would ask you about the hazards of uranium and beryllium.

With BWXT potentially considering moving the pelleting operation to the Peterborough facility, has

there been any consultation with workers about that?

MR. ROGERS: We've been informed that we want to get a licence to possibly do the pelleting, but there has never been a discussion saying that that pellet plant is coming to Toronto. They just want to prepare it in case that situation happens.

THE PRESIDENT: Thank you.

Mr. Jammal, did you want to say something?

MR. JAMMAL: Thank you, Madam Chair.

The discussion with respect to safety from Dr. Demeter and, I believe, Dr. Berube, I'd just like to go on the record to inform the Commission and the staff at BWXT our colleague, Julian, inspects the sites, the facility, and he will take action with respect to any safety issues and he will protect the identity and the confidentiality of staff raising any issues with Julian.

And the staff did act on information.

I will pass the floor on to him to confirm.

MR. AMALRAJ: Julian Amalraj, for the record.

We just wanted to put on record some of the processes that we have in terms of compliance

verification that we do to ensure worker safety.

Every inspection includes a full walk-about of our facilities and we specifically request and require that the union representative accompany us in these inspections.

We have direct access to the union and the workers, and we regularly interview the workers in terms of issues of personal accountability, the issues the worker safety boards raise and how they are resolved if there have been any disagreements between them.

While it is rare, it is not uncommon for us to, when we read through these meeting minutes, to see CNSC Staff take note of some of these issues. And we regularly follow upon these.

We directly interview the workers associated with these things in a private setting. We ensure that the associated safety aspects of it's addressed.

Some of the enforcement actions that we have raised with the licensee are not even aware that they are actually directed based on our interviews from the workers.

So in that aspect, we look at it as an

independent review in terms of worker safety. We ensure that the obligations of the licensee and the obligations of the workers are met as per regulations.

As well, we look at each and every issue that are directly brought up and in some cases, in terms of interviews, if there are precautionary actions that need to be taken like, for example, action level accidents where we don't have direct root cause, we ensure that the worker is protected in that aspect.

And if they have to be reassigned for non-nuclear work for a period of time to ensure the dose management aspects of it is happening, we make sure that that is happening and we follow that.

And this is something that we do with every inspection.

THE PRESIDENT: Thank you very much for that, Mr. Rogers. Thank you very much for your intervention.

Did you have any final closing comments you wanted to make?

MR. ROGERS: No, thank you. I'm good.

THE PRESIDENT: Thank you.

We'll now break for lunch and resume at

1:15 p.m. Thank you.

--- Upon recessing at 12:30 p.m. /

Suspension à 12 h 30

--- Upon resuming at 1:14 p.m. /

Reprise à 13 h 14

THE PRESIDENT: Good afternoon and welcome back.

Our next presentation is by Mr. Steve Daniels, as outlined in CMD 20-H2.75, 75A and 75B.

Mr. Daniels, over to you.

CMD 20-H2.75/20-H2.75A/20-H2.75B

Oral presentation by Steve Daniels

MR. DANIELS: Thank you, Madam President. Good afternoon to the Commissioners. Thank you for this opportunity to speak and share my opinions with you today.

My name is Steve Daniels. I live on Bolivar Street in Peterborough, Ontario, just north of the BWXT facility. I'm an artist and a Professor of Fine Arts at the University of Toronto. A part of my formal training

includes a Master's Degree in science. I'm the parent of two amazing teens.

I'm not an expert in any way on the nuclear industry but I'm becoming, unfortunately, an expert of living next to it. I would like to share with you today some of my concerns concerning my perceived lack of transparency in the communication of BWXT and why I will ask you to deny their request to bring pelleting to Peterborough.

In the slide, the text that really matters is the clip from a local newspaper in the square box, and I will read it for the record. It says: Future uses of General Electric site may be limited due to chemical contamination. Renting or redeveloping GE could be difficult after government agencies find high levels of toxic chemicals in the soil.

This is an alarming headline, given that I live just a few hundred metres away. It speaks to the history of harm that came from GE and at this site, and part of that including GE Nuclear.

But the part that really scares me isn't the text, it's the date. It's small for you to see but it's August 31, 2017, eight full months after BWXT had

received the licence transfer from the CNSC, eight full months after they are already present in our community. And nobody knew.

And if it had not been for my neighbours and the concerns they raised and the time they took to speak to me, I wouldn't have known to attend the October 8th public information session held by BWXT.

It had glossy literature and opaque conversations. I met a number of the BWXT employees, their plight well spoken, and they did their best to convince me that pelleting would be an excellent idea for Peterborough.

But none of them lived in our town.

They spoke of possibilities and benefits but they didn't speak to potential risks. The impacts of pelleting were glossed over or neglected in their discussions. And it wasn't until I headed home and started doing research and trying to inform myself about what pelleting meant and what that could mean for my community, and started reading BWXT compliance reports, that I came to realize that in every measurable category reported by BWXT, whether it was exposure for workers, potential harm to community members, uranium releases into the air and the water, environmental and community contamination, in every

single metric the risks are higher in Toronto than they are in Peterborough, every one.

And the difference between those two sites is this task called pelleting.

They did tell us -- and here's a photo I took of one of the posters at that information session. The blue box is mine for highlighting and again it will be difficult for you to see.

It says: There is no current plan to change our state of operations. We just need flexibility at the Peterborough facility because there are changing business needs over this decades long licence period -- or decade long licence period.

And it was really pitched that because of the duration of this licence, flexibility was a necessary business requirement.

I will invite you to imagine my shock then when I walked across that room and spoke to a staff member from the CNSC, and they said but BWXT asked for that.

How can they be oppressed by their own request? How can their request be their constraint?

Also in their compliance report is this map. I find this map really fascinating because it speaks

incredible volumes to me as a visual artist: incomplete roads, these kind of spaces. You could be forgiven to look at this and think you're in a sort of out of town industrial area when you see this map of the site in Peterborough.

I would like to correct that impression for you.

We are zoomed out a little bit here. This is a Google map image that I captured. The site is highlighted in the white block. And just for a little bit of context, we are sitting here in this hotel about one site width away from the spot that BWXT is located.

Here is a water outflow with wastewater entering into a community gem known as Little Lake. I live right around here.

This little green splotch is referred to by my children as the playground. It's the space where we spent many evenings and summer weekends when they were growing up, a place where they could watch the mud ooze between their toes. Over here is the splash pad. Up here is the skate park. Down here is where the community gathers twice a week in the summer to listen to free music concerts.

I mention each of these sites because each and every one of them has had increasing measures of beryllium; the sites where my children play and grew. Beryllium has become a recent concern for us.

But the really big part of this map that they really don't want you looking at is this area right here: Prince of Wales School.

It was carefully cut out of every photo and aerial view of this site in the presentations from both the CNSC staff and the BWXT staff yesterday. Nobody wants to talk about the fact that there is this elementary school right across the street.

Beryllium levels, according to my neighbour and friend, Julian Aherne, who spoke to you last night, have more than doubled, given IEMP data. And we know that right here is the stack.

We are left to wonder what the consequences of this are for our community and for our children. And now you want to add uranium and liquid hydrogen to a mix that already includes asbestos and PCBs.

I mentioned that article at the beginning. Our community breathed a sigh of relief when we thought no one could possibly move into the site. I guess we found

the solution to pollution is more pollution.

The data difference between what's being found by the IEMP and the emissions being reported in compliance reports do not give us any sense of confidence. There are real health concerns.

I think we are clinging to these beryllium numbers because they are the only concrete solid numbers we have. Everything else is a probability, a maybe, a risk. This is what we actually know. And we know that you want to add uranium as well.

It is deeply disconcerting.

Taken together, these incomplete stories, these partial explanations have led to a real loss of trust between our community and BWXT, certainly between myself and the community I now live with, BXWT, as a neighbour.

I feel the misinformation and the incomplete communication from this company makes it difficult for me to make informed decisions, and I would like to really emphasize there's a profound difference between an employee who -- and I'm glad he felt safe -- makes the decision to enter into the world of the nuclear industry as a part of his life and a citizen who has the nuclear industry move into his house, his yard, his

neighbourhood. It's a really different perspective.

BWXT has a choice to move here. That employee has a choice to work for that company. I live here. I've lived here since before BWXT became a neighbour. I don't have a choice to be their neighbour.

I do have a choice to ask you not to allow pelleting in my community.

I really feel my kids, the kids in our community, deserve more than misinformation and partial truths and I'm requesting that CNSC consider this pelleting plan and the consequences of beryllium and insist that BWXT bring us a clear description of their intention for what they want to do at this site, not a business need for flexibility but actually tell us what you want to do.

So I ask that given that this need for flexibility that BWXT presented to the community over the lifetime of their licence is driving their request to bring pelleting into Peterborough, and given that this need is actually really a desired business solution to a problem they created for themselves, and given that BWXT has repeatedly said they don't want to pellet here anyway, I recommend and ask that this Commission deny BWXT's request to include pelleting in the Peterborough plant as part of

their licence renewal.

And further, and this was in addition to my original submission, as we learn more about the beryllium levels, I ask the CNSC and this Commission to deny the BWXT licence until proper independent monitoring, public disclosure and environmental protections can be put in place.

We need to understand what's happening with beryllium before we can seriously have a conversation about including uranium and liquid hydrogen in our neighbourhood.

To sum up, I would just like to reiterate that we would like you to deny the pelleting request and seriously reflect on the length of this licence and help us as neighbours of BWXT to protect our children.

Thank you.

THE PRESIDENT: Thank you very much, Mr. Daniels.

Dr. Demeter.

MEMBER DEMETER: Thank you for your presentation. I'm going to ask BWXT to respond to the newspaper article from 2017 that talked about toxic chemicals.

What is your understanding of what those were and where specifically were they located? That was within your operating period.

The one slide that showed from the Peterborough newspaper.

MR. MacQUARRIE: It's John MacQuarrie, for the record.

So you are referring to the chart where he had the notice about GE legacy contamination on the site?

MEMBER DEMETER: Yes. What was that referring to?

MR. MacQUARRIE: As far as I know -- so I'm not familiar with that exact article, but there's been lots of information in the community about potential contamination from the GE operations on the site. I don't believe it had anything to do with our business.

THE PRESIDENT: Do you want to ask the Ministry of Environment, Conservation and Parks about that?

MEMBER DEMETER: Yes, that would be a good idea; thank you.

Would the provincial Ministry of Environment, Conservation and Parks be able to...?

THE PRESIDENT: Ministry of Environment,

Conservation and Parks, are you on the line?

MR. MUGFORD: Yes, Jamie Mugford, Ministry of Environment, Conservation and Parks.

MEMBER DEMETER: So the question was there was a newspaper article from the local newspaper that talks about toxicity of the former GE site that would make it unsuitable for future use.

Do you have any understanding of what the particular toxicity was related to and the validity of the claim that it would make it unsuitable for future use?

MR. MUGFORD: So there is historic site contamination issues at the GE industrial property overall. There is some historic PCB contamination. GE is doing a lot of work to manage their site contamination issues and prevent off-site impacts.

They monitor and do mitigation work for the PCB contamination, and there is a groundwater plume of trichloroethylene that they have an extraction treatment system in place.

We ensure that there is not off-site impacts happening. We are satisfied with the work that General Electric is doing with the site.

In terms of limiting future use, there

probably is reality to that. That applies to any industrial property. They would need to go through the proper assessments and studies to determine what uses could be made of the property.

MEMBER DEMETER: Although outside the scope of potentially our jurisdiction, but just to answer the question, what jurisdiction do you have and how far can you push it that those legacy issues are managed to make it recoverable to a brown site or a green site, if that's a future?

MR. MUGFORD: Jamie Mugford, for the record.

We have the *Environmental Protection Act* that we use and the *Ontario Water Resources Act*. They both have sections in them about preventing adverse impacts and abilities to require entities to do work to prevent adverse impacts.

So they are doing work to address and prevent off-site impacts from occurring.

Beyond that, it's a company's decision as to how they manage their properties.

MEMBER DEMETER: Okay, thank you.

THE PRESIDENT: Thank you.

Dr. Berube.

MEMBER BERUBE: Thanks for your presentation. We respect your concerns about the area.

My question is for the CNSC.

Given the uncertainty here with pelleting and future pelleting operations here in Peterborough -- a decision clearly hasn't been made yet by the supplier as to whether or not they are going to do it yet -- why would you recommend a ten-year licence?

MS TADROS: Haidy Tadros, for the record.

Notwithstanding BWXT's use of the word flexibility or not sure, CNSC staff's assessment based on the information submitted took pelleting into consideration.

We reviewed the application and the supporting documentation and we've talked about the safety analysis reports, the environmental risk assessment reports, all of the programs in place of the current BWXT operation in mind when we were reviewing the application.

So the proposal and the recommendation before the Commission includes the fact that staff have assessed this application with pelleting in mind, given that BWXT does conduct pelleting operations in Toronto as

well. Notwithstanding that it's not in Peterborough, the safety case before you includes pelleting operations and the hazards associated with it.

So we really weren't swayed by the when and the if and the buts. We used the programs, the science, the review of all of the programs as though pelleting were happening, which it is, and hence why we've recommended to put two licence conditions on there, licence conditions that will before pelleting starts allow CNSC staff to review the commissioning reports, review the environmental protection program that will need to be in place before any operation starts.

MEMBER BERUBE: Just a further on that. Obviously in that modelling to take a look at the safety case of that, you of course are very aware that the emissions are going to increase in Peterborough if that's the case that pelleting is done here. You have obviously put that in.

How did you come about the model to actually model the actual discharges that would come from that operation?

MS TADROS: Haidy Tadros, for the record. Our environmental protection specialist

can address that question.

MR. McALLISTER: Andrew McAllister,
Director in the Environmental Risk Assessment Division.

I will start the answer and then others
might complement it.

The approach that was taken by BWXT in its
environmental risk assessment was to look at a sort of
consolidated operation. So it was taking the sort of
combined emissions and looking at those values relative to
guidelines and things like that that are meant to be
protective of human health, of the environment.

What is important to note -- and I'm glad
we have the Ministry of Environment on the line -- is that
they also have an environmental compliance approval.
Perhaps the Ministry can elaborate on what changes might
need to arise in their regulatory instrument, because they
do have a big modelling component to that, should the
pelleting operation come to Peterborough.

MEMBER BERUBE: If the Ministry is still
on the line, could you give us some insights into the
modelling you have done to validate that the site would be
safe given pelleting operations?

MR. MUGFORD: Jamie Mugford, Ministry of

the Environment, for the record here.

I'm not sure if we have some of our technical people available, but I can try to answer generally.

If pelleting were to be brought to the facility, there would need to be an amendment. The company would need to apply for an amendment to its air approval and determine what its new emissions would be and ensure that those would be able to meet our air standards. Then they would also need to do actual -- assuming our assessments and modelling are done, there are models that show how the air emission contaminants would be dispersed, and concentrations. And if they meet our limits and we are satisfied with the application, an amendment to the approval would presumably be issued and the company would have conditions in there that would require certain things: stack monitoring and updating emission summary dispersion, modelling and tables that continue to show that it is meeting our standards and whatever conditions we might include in there.

Possibly there could be conditions for ambient air quality monitoring as well.

It would all need to be determined at the

time through the information at hand that's part of the submission.

In terms of surface water there was approval recently issued to General Electric in regards to their work with PCB contaminant, surface water work. So it is specific to that.

We could consider whether it's appropriate to add something in to that, to expand that, amend that approval if it's appropriate to include some monitoring and limits for contaminants associated with pelleting operation. But that would all need to be determined based on assessments at the time.

MEMBER BERUBE: Just one last question here for BWXT.

Given the pelleting operations being moved from Toronto to Peterborough, since you're the owner/operator of the process and you'd be responsible for installing, implementing and monitoring for the most part, do you see emissions equivalent to what you're doing now, or would you see a reduction or an increase? What's your expectations?

MR. MacQUARRIE: It's John MacQuarrie, for the record.

My expectations would be that the emissions would be similar to what we're experiencing in Toronto right now for pelleting operations.

THE PRESIDENT: Dr. Lacroix?

Dr. McKinnon?

MEMBER MCKINNON: Yes, thanks. I'd like to return to the issue of beryllium which Mr. Daniels has brought up. I think it's a major concern and we'll probably keep returning to it. So my questions are for CNSC staff. We have talked about the air as being one of the -- the mechanism of transport for beryllium onto the soil. And it was mentioned in Mr. Daniels' report about accumulation, so it made me think would there be any soil conditions that would prevent dispersion of beryllium in the soil over time so that they - it would just keep on increasing at any location, for example, if the soil was very impermeable, claylike, or why doesn't it always increase, in other words? Could you discuss those issues?

MR. RINKER: Mike Rinker, for the record.

So we have a soils scientist in Ottawa, Dr. Michael Ilin who would help talk about the mechanisms of mobility of beryllium once it reaches the soil.

MR. ILIN: Good afternoon. My name is

Michael Ilin, I am the environmental risk assessment specialist. Yesterday I provided an answer with regard to the overall aspects of the accumulation of contaminants in the soils.

So actually all of that applies Beryllium and actually the substance that's deposited on the soil can be washed into the surface water or dissolved, leached into the groundwater. Absorption mechanisms are usually strong enough to prevent significant amounts of substances, including uranium and beryllium from leaching from soil - surface soil to groundwater.

The potential for leaching is dependant upon soil properties such as, for example, Ph, oxidation-reduction potential, soil porosity, et cetera. For example, soils containing clay are most likely to retain contaminants, while soils that are composed of silt and sand are less likely to do so.

The -- I believe that there is a need to clarify some things here. Actually, the -- there are two important aspects with regard to the soil concentrations of uranium and particularly beryllium in Peterborough. The first important aspect is soil quality, and the second one is the trends in soil concentrations observed in between

2014 and 2019.

It's important that soil quality is not a subject of scientific interpretation. To assess soil quality CNSC staff used the provincial soil standards and the federal soil quality guidelines by the Canadian Council of Ministers of the Environment.

Given that concentrations of uranium and beryllium, measured by CNSC in 2014, 2018 and 2019 near the BWXT facility in Peterborough, are significantly below the standards and guidelines, CNSC staff has concluded that the environment and humans are protected.

No intervention submissions are focussed on soil quality. Rather, they discuss the increase in beryllium concentrations within the range of natural background.

Although this could be a subject of future scientific research, no submissions provide the basis to modify the CNSC staff conclusions based on the results of the soil sampling in Peterborough. I believe it is very important, and when we talk about the potential research or potential monitoring program in Peterborough we need to consider the risk from the facility as well as the fact that BWXT is not the source of so-called elevated

concentrations in Peterborough.

The concentrations in Peterborough of Beryllium and uranium are not elevated at all. To be elevated they need to exceed the background upper level of normal, that's actually 2.5 milligram per kilogram. I think this clarification would be important.

Also, CNSC staff has prepared to address any other questions the Commission may have with regard to the submission from Dr. Aherne that he presented yesterday.

Thank you.

MEMBER MCKINNON: Okay. So the key point is that the current levels of concentration are so small that there is no need to further classify the types of soils around the area in order to advise on the monitoring of the beryllium.

MR. RINKER: Mike Rinker, for the record.

And we may draw upon the expertise of the province, who is on the phone, who has similar expertise that we're providing. But if I was to tackle this question in terms of mass balance, the emissions from the facility are on the order of 15 milligrams per year, so that would roughly cause 15 kilograms of soil to increase by a milligram per kilogram. It's a very small amount of soil.

If those emissions are incorrect, and we don't think they are, but we're going to do more soil sampling and more monitoring to see. We're really talking about a very small potential area or extremely small changes to the beryllium concentration in the soil, and I don't think it warrants that next level of study when the mass balance kind of really limits the -- you know, how much this -- this release could cause -- could pose to the environment.

MEMBER MCKINNON: Okay, that's very helpful. Thank you very much.

THE PRESIDENT: I have a couple of quick questions. The first one is for BWXT. How many employees do you have at the Peterborough site?

MR. MacQUARRIE: It's John MacQuarrie. It's about 300. I don't have the exact number off the top of my head.

THE PRESIDENT: And do you know how many live in Peterborough of those 300?

MR. MacQUARRIE: It's approximately 60 percent of those who do.

THE PRESIDENT: Okay. So a significant number of them.

My next question is for CNSC staff, and it's about the licence transfer that happened in -- sometime, I guess, in 2017.

What are the considerations in -- in staff's recommendation to the Commission around licence transfer and whether there is a need for public input or not?

MS TADROS: Haidy Tadros, for the record.

So staff's recommendation at the time, which the Commission had accepted, was that this was an administrative ownership transfer, so from the perspective that -- and it is captured in the record of decision that the Commission had put out after the decision was rendered. From the perspective that the management system programs do not change, the leadership does not change, the environmental protection programs do not change. So all that we would be looking at to either formulate a change of some kind of operations which is what we are doing here today, was not there in 2016. It was an ownership change.

Amalgamation, we were looking for certainties that their management system was still in place, that the licensee is qualified and would make adequate provision for the protection of people and the

environment. And, in all of the information that we reviewed that was submitted, and our understanding of that ownership change, none of the operational changes were impacted. So that was the recommendation of staff to transfer the licence in terms of corporation and name of organization.

THE PRESIDENT: Any other questions?

Dr. Demeter?

MEMBER DEMETER: We can deal with this maybe a little bit later.

First, a clarification from staff and then I'll ask BWXT staff.

I looked a Licence Condition 15.1 and 15.2 which largely deal with pelleting. And under your section -- under CNSC section, under Proposed Licence Changes page 97 of your CMD, it says for 15.1 that the updated environmental monitoring program at the Peterborough facility shall submit this one year prior to the commencement of commissioning, or at least one year -- one year. But in the actual licence condition there is not time; it just says shall submit it prior, so there's a bit of discrepancy between one year prior and just prior. So maybe you can help with that clarification; which is it?

And then I'll ask BWXT a question.

DR. DUCROS: Caroline Ducros, for the record.

So I don't know if you want to put up the errata from the presentation, but the second errata that we spoke about during our presentation was that the Licence Condition 15.1 should be worded the same way as the Licence Condition 15.1 in the draft proposed licence.

But in terms of the length, if you want to know the length, it's based on the CSA Standard and the environmental protection people can speak to that.

MEMBER DEMETER: So, BXWT, in helping us understand and try to make the safety case, I'm really curious why you didn't do the work required to provide an updated environmental monitoring program report so that when we got here we didn't have to say, 'Well, if decide to do it later we'll submit the report.' To me, it looks like a -- to me, it's an absence of information that would really help me make a determination versus delegating this to the staff later on if you decide to do it.

It would have been really helpful to have that information, so maybe you can help me understand why you didn't do that work, if that's a potential you want to

do it over the next ten years, if the license is granted or for whatever period?

MR. MacQUARRIE: It's John MacQuarrie, for the record.

I'm not sure I'm fully understanding your question, but are you asking why we didn't provide an environmental monitoring program that would be in place?

MEMBER DEMETER: You've made it clear that you know one of the potential things you may want to do is move your pelleting production here and consolidate it here. If that was a serious consideration from our side of the table it would have been really helpful, and this is something you're going to have to do anyways. It would have been really helpful, because we have to speculate as to the safety case for the environmental monitoring report results, which we don't have, and it just -- it's a bit of an absence of information.

If it was there, it would really help us make a decision here now, versus, say, 'We'll get that information later.'

MR. MacQUARRIE: It's John MacQuarrie, for the record.

So it's not something we're going to have

to do in any case. It would only be done if we made the decision, then we were authorized to move. We don't know if we're authorized to move, hence the request.

I think that it's pretty clear how we manage our business where we make pellets in Toronto and that we would implement exactly the same process when we move to Peterborough, if we move to Peterborough.

You know, our -- to be clear, our intention is not to have to move the facility. We're going to -- we're facing a possible reduction in demand of our business by about 40 percent; that is concerning for a commercial enterprise. And so we are trying to figure out how we might deal with that. But that may not happen because there's nine other reactor in this country and we're going to try to sell fuel to those people, and hopefully that works out.

But if it doesn't, we may have to be faced with a more difficult situation and we may decide then at that point that we need to do this.

I think we've demonstrated that we do it responsibly and properly and that we comply with all regulations and requirements. And I think we've demonstrated pretty clearly exactly how we do that and how

we've got it in control, from our perspective.

MEMBER DEMETER: I understand the process may be similar. And, I also understand the layout and the ventilation and the facility structure may be different between the two, so it still would require a fine-tooth understanding of the environmental impact before it would be approved, in any way.

MS TADROS: Haidy Tadros, for the record.

Perhaps I can just maybe add. So when we speak about the safety case, what's before the Commission as staff's recommendation is a proposal for a complete safety case. We're not giving you half a safety case and asking you to wait for more information to come.

So what we have looked at is the complete set of programs and all of the different analysis that comes to play when we put a boundary around what BWXT is doing. So what -- the documentation you have before you is a complete safety case.

The licence conditions that we are proposing are in effect hold points. So, if you agree in your deliberations that this is a complete safety case, the hold points will then allow us to verify that the steps to incur the implementation that is currently one location and

another location is done according to that safety case.

So I -- I just wanted to clarify that. Perhaps Julian can add, if he wants to get into detail.

MR. AMALRAJ: Julian Amalraj, for the record.

So in terms of the monitoring processes that are needed, the safety case is determined by the licence release limits and the environmental risk assessments that are associated with that in terms of justification of what can be emitted.

What we have done is that the Peterborough's risk assessment in terms of what the emissions concentrations are do not require the additional environmental ambient environmental monitoring whereas, the Toronto releases which is. Peterborough is less than one percent of the release limit. Toronto is around one percent. The slight increase would mandate under CNSC requirements to have the traditional ambient air monitoring.

And the CSA standards are pretty prescriptive in that how the monitoring programs should be structured, and how it should be implemented.

What CNSC staff is asking for is the

licence condition will allow for us to confirm that if pelleting is brought in under the existing safety case for the slight increase they would require the additional ambient monitoring and we would confirm that the monitoring program is being implemented as per the CSA standards which is the prescribed requirement.

We are not opening up, or we're not asking for a change in the existing safety case.

MEMBER DEMETER: So if I were to ask you right now based on the Peterborough and Toronto experiences noting that this is the whole point, what are the expected emissions -- air emissions from this facility if they move pelleting here? Could you tell me?

MR. AMALRAJ: Julian Amalraj, for the record.

Yes. So the characteristics of the Toronto plant and the emissions are essentially based out of what the processes are and the processes performance characteristics are based on the technology in terms of pollution and dust control that allows for the emissions. What the environmental risk assessment has done is taken those performance characteristics, superimposed on the Peterborough plant, and provided a consolidated estimate of

what the safety case would look like if that happened.

And our assessment there shows that when we have done that, it would still be within the same safety case as what Peterborough is right now. And it is the emissions would look similar to Toronto, but it would still fit under the safety case of Peterborough.

MEMBER DEMETER: Thank you.

THE PRESIDENT: So Mr. MacQuarrie, how far ahead of, if you do decide that you want to transfer your operations from when you do have to move, like is it two years before that you make a decision that, 'You know what, we do want to consolidate all our operations in Peterborough.'

MR. MacQUARRIE: It's John MacQuarrie, for the record.

I don't have an exact duration but off the top of my head I think if we made that decision it would be at least two years to do all of the things that we would need to do to be ready to -- you know, to then submit all the information that we would need to submit to satisfy the hold points.

THE PRESIDENT: So again, help me understand what your motivation is to have asked for this

flexibility now, rather than waiting until you have made a decision of whether you really are going to, or not?

MR. MacQUARRIE: John MacQuarrie. I don't think we can make a decision until we know whether we're authorized to do so, so what we're seeking through this process is to find out if that's even a possibility before we -- we try to make any sort of decision or analyse it any further.

THE PRESIDENT: Thank you.

Over to you, Mr. Daniels, for any final word.

MR. DANIELS: Thank you. I would like to reiterate that as a forced neighbour of this industry I feel that my family, my neighbours and I deserve a clear statement of business intent from BWXT. And I feel we should be given the opportunity to engage in a process that allows us to know actually what we're facing and what we're engaging, so that we can understand what's happening in our own community and in our yards.

I would like to acknowledge that, yes, the beryllium levels are not at threshold, but they are increasing, in some cases doubling, and if those are actual trends that are substantiated, then we're talking about

threshold level issues in the not too distant future.

I'd like to take a moment to thank my neighbours for alerting me to these concerns. Their energy, their effort, their support, their enthusiasm for Peterborough is truly heartwarming and has really made the challenge of this situation bearable.

And, finally, I'd like to thank you for your time and reiterate that I ask you to deny this application for pelleting in Peterborough and give us the opportunity to face this issue properly.

Thank you.

THE PRESIDENT: Thank you.

We'll move to our next presentation which is from the Peterborough Public Health as outlined in CMD 20-H2.139. Dr. Rosana Salvaterra will be presenting the submission.

Dr. Salvaterra, I know you've got a whole lot of there high priorities that you're handling right now, so thank you for being with us today. And the floor is yours.

CMD 20-H2.139

Oral presentation by Rosana Salvaterra

DR. SALVATERRA: Thank you. Rosana Salvaterra, for the record.

Good afternoon and welcome to Peterborough, Commissioners. I would just like to introduce, as well, my colleagues sitting here at the table with me. I have Rita Chung, who is the manager of toxicology and exposure assessment within the Environmental and Occupational Health Department of Public Health Ontario.

And to her right, is Julie Ingraham, who is my manager of Environmental Health.

So to begin, Peterborough Public Health serves the county and City of Peterborough as well as two First Nations, Curve Lake and Hiawatha. As its medical officer of health I oversee an organization that together is responsible for the *Health Protection and Promotion Act* and in that for preventing, eliminating and decreasing the effects of health hazards. For this reason, we have made a written submission and I have come today to provide supplementary comments.

According to the International Agency for Research on Cancer's 2020 report, humans have always been exposed to ionizing radiation from natural sources. And although exposure to natural radionuclides like uranium will vary from place to place, the water we drink, the vegetables we eat, and the air we breathe will all contain very small amounts of radioactive particles. In fact, our most significant dose of inhaled radiation and alpha particles or 40 percent of our daily dose comes from the radon gas present in the indoor air we breathe at home.

Concern about radiation is valid. We believe that radon gas is a leading cause of lung cancer in Ontario, second only to tobacco smoke, which is why Peterborough Public Health promotes the testing for radon gas by tenants and homeowners, and why we make free testing kits available whenever we can.

Radiation induced cancers for people living in Peterborough are more likely to come from inhaling radon gas in their homes or from UV exposure from sunlight or from too many CT scans than from any particle of uranium associated with the BWXT plant on Monaghan Road.

The recently released IARP report contains a chapter on ionizing radiation and states that recent

studies have improved our knowledge of radiation-induced risks at low doses down to a few hundred millisieverts for solid cancers and a few tens of millisieverts for childhood leukemia.

These results have contributed to the strengthening of the radiation protection system. It would be my hope that the CNSC is working proactively with international partners to potentially reduce its current public dose limit from 1 mSv per year to an even lower allowable dose. This would help shore up the public's confidence in regulators and potentially help mitigate future concerns about safety.

In reviewing the available data from both BWXT facilities, it does appear that they are operating well below their release limits, whether it is to air or to water or through direct measurement by external dosimeters, indicating that the neighbouring communities are not experiencing more than just background levels of radiation.

That said, I can't tell you what the baseline radiation dose is for people living in Peterborough and that would be helpful to have wherever there are nuclear facilities operating. It would be particularly helpful in communities like ours where the

legacy of industrial activity represents a historical trauma to families of workers who were harmed and to neighbourhoods coping with ongoing chemical contamination.

I am sure that the Commissioners are well aware of the hazards associated with uranium and beryllium. Human and animal data provide evidence that inhaled beryllium is a human lung carcinogen at doses that are 50 to 100 times higher than the current maximums allowed in ambient air. At high enough doses it also causes inflammatory responses, both acutely and in chronic exposures.

Uranium is both a heavy metal and a radionuclide and its toxicity depends on the route of exposure as well as its chemical properties such as its solubility. The kidney is the main target, with resulting damage to renal function possible.

For all these reasons and more, there are both occupational and environmental limits set to protect workers and the general public. Exposures related to BWXT appear to be well below these health protective limits.

The Canadian Soil Quality Guidelines, of which we just heard recently today, have been derived based on toxicological information and other scientific data.

The guidelines for beryllium take into account both the cancer and the non-cancer toxic effects.

In 2015 a review of the guidelines indicated that a limit of 75 milligrams per kilogram is protective for non-cancer harms and that 550 milligrams per kilogram is protective against cancer based on a one in a million lifetime incremental cancer risk. Despite the findings of this review, the 1991 Interim Soil Criteria Guideline of only 4 milligrams per kilogram has been retained for residential and park land.

So in this context of a large margin of precaution, we note that beryllium results from soil testing carried out as part of the Independent Environmental Monitoring in Peterborough seemed to show an upward trend which, if real, is approaching the current guideline of 4 milligrams per kilogram. Of concern is that these results are from the school where young children play.

Given the results from the continuous in-stack monitoring for beryllium and the data from a small sample of independent ambient air monitoring, both showing either undetectable or levels far below guidelines and regulations for beryllium, there is an inconsistency that

is begging to be answered. It is for this reason that the Commissioners will note our request in our written submission that this be investigated, explained, if found to be real, corrected prior to a decision about a long-term licensing for the plant.

Environmental monitoring at and around any industrial facilities critical to confirm that fugitive emissions are not escaping from the plant. Currently, BWXT is not required to implement an Environmental Monitoring Program in Peterborough. The only such program is the IEMP conducted by the CNSC.

CNSC staff have recommended to Commissioners that BWXT establish additional environmental monitoring prior to the initiation of pelleting in Peterborough. However, given that the Peterborough facility is located within a residential area and in close proximity to an elementary school, I am recommending an Environmental Monitoring Program regardless of whether or not pelleting comes to our community.

The CNSC's IEMP has several limitations, including low sampling frequency rates, limited sample size and a lack of continuous ambient air monitoring. The limited data available from this sampling program make it

more difficult to support generalized conclusions regarding exposure or impacts to the population.

When it comes to nuclear facilities, according to the CNSC, environmental monitoring should do three things: measure contaminants in surrounding environmental media, determine the effects, if any, of the site or facility operations on people and the environment, and serve as a secondary support to emission monitoring programs to demonstrate the effectiveness of emission controls. The design of the program must conform to requirements determined by the Canadian Standards Association.

However, there are other practices for consideration. For instance, as the program is being designed, representatives of the community at large should be engaged. One of its goals should be the real-time accessibility of information and data by the public, and for this particular facility environmental monitoring should address all potential routes of exposure for uranium and beryllium, including water, air and soil.

Consideration should be given to the fact that treated effluent from the Peterborough Wastewater Treatment Plant is discharged into the Otonabee River,

which has immense cultural and recreational significance for the residents of the city, the county, Curve Lake and Hiawatha First Nations. Periodic sampling of the water downstream from the effluent release point and analysis for beryllium and uranium are recommended.

When it comes to air, active air monitoring is important, given that inhalation is a primary route of exposure. As a minimum, in response to community concerns, we recommend an air monitoring station to be located at the Prince of Wales Public School. Ideally, a second air monitoring station should also be located based on assessments of exposure to the population according to wind direction and population density.

Sampling of surface soils around the BWXT Peterborough facility should be another key component. A well-designed soil sampling program has the potential to provide a cost-effective means of evaluating potential spatial impacts of emissions. We recommend a minimum of 25 sampling sites with a minimum sampling frequency of three years.

In our written submission we recommended that additional environmental monitoring be conducted by a neutral third party and for results to be shared in a

timely and transparent manner. We were glad to see that BWXT has already started recruiting volunteers for a new Peterborough Community Liaison Committee and this is a positive first step. The regular review of monitoring data by this Committee will help to increase public confidence by reassuring the residents of Peterborough that BWXT is operating safely.

Independent monitoring, transparency and strong communications are key ingredients to rebuilding trust in our community so that residents can heal.

THE PRESIDENT: Thank you very much for your submission, Dr. Salvaterra.

Dr. Berube...?

MEMBER BERUBE: Well, thank you for that submission. Very thorough and extensive list of recommendations.

So I am going to turn to CNSC at this point. We have been talking about IEMP monitoring of beryllium for quite a while and I think there was some consensus that you were thinking about stepping up that program. Do you have any more insight or visibility of what that would look like at this point?

MR. RINKER: Mike Rinker, for the record.

So certainly, we want to follow up to make sure that there is certainty in what results have been obtained to date and what they mean and that requires some more thorough monitoring. But we also want to use this program to engage the community and to build trust into what the monitoring results mean, and part of that strategy will be to engage local authorities. So we will be speaking to academics from Trent University.

We have heard some really good advice in the intervention just now about what the expectations are, what that program will look like, so we want to take into account the advice and the needs that we hear from the local community to design the program to make it something that is acceptable.

I would also state, though, we will be reviewing what BWXT intend to do themselves. I think it's important to add, also in realism, you know, we have heard some suggestions of monitoring rivers and monitoring other areas, there are some constraints that we need to take into consideration.

One constraint is how much beryllium passes through that facility in its entirety and it's approximately 15 kilograms. So you can bound -- what if

they were totally ineffective at using beryllium and it all went up the stack? That's the maximum that could be released in a year. So are you monitoring in areas where even with that bounding you would never see any beryllium? And you don't necessarily want to monitor in areas that you know there will be no impact and it would just confound the results.

So we want to constrain it to the realism around the facility, but also to engage the community to make sure that they understand why. They can come out and join us while we are sampling and see what science we are using and hear back and forth. So we have some planning to do, we have some engagement to do to do it right.

MEMBER BERUBE: And also for BWXT, many of the intervenors talked about monitoring for uranium. I guess at the Toronto facility because of the pelleting operations you're doing this perimeter monitoring. But here in Peterborough, are you actually doing any perimeter monitoring on that at all? I don't think there is really --

MR. SNOPEK: Dave Snopek, for the record. That's right. In Toronto we do perimeter monitoring at five points around the fence line. In

Peterborough we don't do that perimeter monitoring and the reason for that is we have one release point with the potential for uranium in air. We do monitor that in the stack. It is filtered through a HEPA filter prior to monitoring and the results from that are essentially virtually that we are not releasing uranium from that stack.

Certainly, the concentrations in that stack are, without exception, below the concentrations set by both the CNSC and also the MOE at the fence line, and for that reason we meet the end point concentrations right in the stack, so we don't have that boundary monitor.

MEMBER BERUBE: Just further to that, obviously if you are going to move your production line here, you would have the intention of doing perimeter monitoring at that point and at other monitoring points?

MR. SNOPEK: Dave Snopek, for the record. That's exactly right.

So we produced a Consolidated Environmental Risk Assessment Report for the purposes of licence application to describe what a consolidated operation would look like from an environmental monitoring perspective and essentially we would be adopting the

practices that we use in Toronto, which includes not only boundary monitoring but also soil sampling for uranium around the Peterborough facility.

MEMBER BERUBE: And CNSC, you have seen this plan already?

DR. DUCROS: Caroline Ducros, for the record.

MEMBER BERUBE: Have you verified it?

DR. DUCROS: Pardon me, yes. Caroline Ducros, for the record. Yes, we have.

So part of our CMD was the Environmental Protection Review Report, I believe that's Appendix D. It deals with an Environmental Risk Assessment Report for the Toronto facility, for the Peterborough facility and the Consolidated ERA.

And I just want to point out that it's not just BWXT's intention that they would put in an Environmental Monitoring Program, it's CNSC's requirement that they would have to do it. And that is the licence conditions that we are proposing, the 15.2 licence condition.

In the *Licence Condition Handbook* there are specific what we call compliance verification criteria

that they have to submit to CNSC. CNSC would review, assess and have to approve before any pelleting could take place.

So for those CVCs, they have to produce an updated Radiation and Environmental Program Manuals that ensure the presence of monitoring of ambient air and soil as per the approved Environmental Risk Assessment at Peterborough, which is to say that we have looked at the Environmental Risk Assessment in accordance with the CSA standards, it has been approved. What we are looking for is for them to report and show us that it has been implemented as we approved it.

They also have to provide to us a Facility Modification Plan that details additional internal air monitoring, use for radiation dose assessment and additional external stack monitoring for additional stacks to be added at Peterborough. And they also have to produce additional effluent treatment systems and monitoring confirming operational limits.

So these are all the limits that we have looked at and assessed as part of the safety case. We need a commissioning report to see that it all has been done and approve that before it can happen.

THE PRESIDENT: Dr. Salvaterra, a question for you. You concluded that the current operations of BWXT in Peterborough, you know, the emissions are well below and wouldn't cause any health impact, and if the pelleting operation is not moving to Peterborough, what is the basis for your recommendation for the environmental monitoring for uranium? Is it based on science or is it based on providing reassurance to members of the public? Help me understand what is driving that.

DR. SALVATERRA: So for the record, Rosana Salvaterra speaking.

It's the latter. It's that the facility has a legacy -- I think you have probably already perceived that in your short time on this particular licensing -- and there is a lack of trust within the community. Also, the fact that there are young children in a school that is not quite adjacent but certainly close to the facility.

I think for all those reasons more data would be more reassuring. I mean the snapshot data I found very reassuring, but it's just not -- it's a limited amount of data and more data that is shared with the community I think will help to build that trust and rebuild the trust that they need.

THE PRESIDENT: Thank you.

BWXT, do you have any comments on the recommendation from the Medical Officer of Health?

MR. SNOPEK: Dave Snopek, for the record.

I think, you know, one of the recommendations certainly was around the beryllium soil sampling around Peterborough. We have committed to do that and we think that absolutely needs to be done to settle this question of beryllium in soil. So we plan to do that in the summer of this year.

With respect to uranium in soil, I personally struggle with that one a little bit, but I understand the perspective of not necessarily a science approach, and when you look at it from a science approach, when you look at the operations in the facility with the potential for release of uranium, they just don't exist. That is supported by the measurements in the uranium stack. We certainly understand the comment with respect to the public trust and I think for that reason we will look at that when we are looking at our planning for the sampling of the soil in the summer.

THE PRESIDENT: And I think the recommendation is more than soil, it is air monitoring as

well and I think it was wastewater. I think it was a whole stream, it was a comprehensive program.

MR. SNOPEK: Dave Snopek, for the record.

I think certainly the soil is our focus. I think from our perspective, getting the soil results and making a decision on future sampling or anything that we need to do from that point, for us I think getting the soil results is the important thing that we need to do. Depending on what those results indicate -- and we believe that they are going to confirm that in fact releases from the facility are not occurring, but we certainly are open to what that data tells us and from that point making a decision on what future monitoring looks like.

THE PRESIDENT: Thank you.

Dr. Lacroix...?

MEMBER LACROIX: Thank you very much, Dr. Salvaterra, for your intervention.

Thus far this week there have been, well, I would say a few Medical Officers that came before this Commission and I must admit that I have a really hard time to sort out their personal opinion from their professional advice. In your case, I hope that I am not mistaken, but I feel that you provide us with your professional advice and

I really value your intervention.

In your written submission I have noticed that you talk about the Ontario *Health Protection and Promotion Act* and I found out that the HPPA requires Medical Officers of Health to stay informed on matters related to occupational and public health. I was wondering, does this mean that a Medical Officer is compelled to share with the public his or her professional advice as opposed to his or her personal opinion?

DR. SALVATERRA: Rosana Salvaterra speaking, for the record.

That is an interesting question. I believe the answer is yes, I have a professional duty under the *Health Protection and Promotion Act* to the people of Peterborough to fully investigate any potential health hazard and give my best advice. The Act also gives me the powers to intervene should I believe there are reasonable and probable grounds for the presence of a health hazard.

So I have wide-ranging authority and also the responsibility and the expectation to work across other ministries like the Ministry of Labour, for example, the Ministry of Environment, Conservation and Parks. So it is a professional duty of a Medical Officer of Health and one

that I believe very strongly in.

So the recommendations today are very much from a health point of view and very much based on the objective evidence that I have before me as well as the weight of evidence on the toxicology of the substances in question.

MEMBER LACROIX: Thank you. That is very helpful. Thank you very much.

THE PRESIDENT: Dr. McKinnon...?

MEMBER MCKINNON: Thank you for all your comments about especially the monitoring program. A lot of very good points. One that I found very interesting was establishing a baseline and I think in any dataset when you take measurements you have to know what you are comparing to and to understand whether -- you know, what is it increasing from or decreasing and what would be the variability.

And we heard from the company that if the decision is made to move the pelleting plant that it would take quite some time, around two years possibly, plus or minus. So my question to CNSC staff would be: Is two years sufficient time to establish a reliable baseline for the different measurements that would be made?

DR. DUCROS: Caroline Ducros, for the record.

I am going to just put the context about what is sufficient and then pass it to the Environmental Protection people to talk about the timelines.

Until it is sufficient, we won't approve. So as long as it takes for that to be sufficient will be the time that it takes.

But I will pass it to the Environmental Protection staff to talk about the CSA standard and the expectations.

MR. McALLISTER: Andrew McAllister, Director of the Environmental Risk Assessment Division.

The CSA standard gives some -- I will say some general guidance on some of those aspects related to sort of the objective of the Environmental Monitoring Program.

I am going to pass this to Dr. Michael Ilin in Ottawa, who has had experience with both the Port Hope soil monitoring programs as well as the BWXT Toronto monitoring programs, to bring that OPEX to this discussion.

So if Dr. Ilin can comment on that.

MR. ILIN: For the record, my name is

Michael Ilin.

Given the absence of soil monitoring in Peterborough currently, it is expected that a baseline soil survey would be conducted by the licensee and that this survey could be based in general on the current methods available. For example, the MOE, or currently the Ministry of the Environment, Conservation and Parks methodology was actually used in 2005 when the toxicological survey was done in Peterborough to assess whether the emissions of beryllium and beryllium compounds from the nuclear fuel bundle operation resulted in elevated concentrations of beryllium in soil on residential and public properties.

CNSC staff will use the CSA standards 288.4 on the environmental monitoring and 288.6 on the environmental risk assessment to determine if the survey methodology is in compliance with applicable recommendations from the environmental monitoring program and the environmental risk assessment perspectives. Thank you.

MEMBER MCKINNON: Okay. Thank you.

And I have one follow-up question for the company.

In designing the future environmental

monitoring program, Dr. Salvaterra mentioned as many as 25 points, suggested monitoring points. Could you describe the methodology you would use in arriving at how many measurement points you would recommend in your program if you were to implement that?

MR. SNOPEK: Dave Snopek, for the record.

Just a question of clarification. I believe that that was in reference to soil sampling locations. Thank you.

We would look at the -- Dave Snopek, for the record.

We would look at the facility, we would look at the environment of the facility to determine the number of points. I can tell you that in Toronto we sample soil at 49 points around the facility. I think the periphery of the facility potentially in Peterborough is larger than the perimeter of the facility in Toronto, so likely it would be more points than that, but we haven't determined the exact number.

MR. MacQUARRIE: Maybe I can just add to that. It's John MacQuarrie.

So, you know, we are not experts at designing that ourselves, so we would be looking to outside

expertise to help us figure that out and we would certainly consult with our CLC and others and Peterborough Public Health, whoever would like to share their thoughts on that. So we are open to that, but we would be looking to involve other experts other than what we have in our company.

MEMBER MCKINNON: Thank you.

And that would be reviewed by CNSC?

MS TADROS: Haidy Tadros, for the record.

Absolutely. And, as Dr. Ducros was saying, it's only until we are satisfied will the hold point be released.

THE PRESIDENT: Dr. Demeter...?

MEMBER DEMETER: Thank you very much, Dr. Salvaterra, for your presentation. I want to take full advantage of you being here for the time that you can be here.

We had a similar discussion with the Medical Officer of Health that was involved in the Toronto area relative to concerns that some intervenors had about cancer rates or other illness rates around the facility.

So the questions I asked them were: Is there any evidence for unexpected increases in cancer rates or other health status indicators such as perinatal,

prenatal, postnatal? Is there anything of concern, taking other facts into consideration of course that can't be in occupational I suppose to a certain extent?

DR. SALVATERRA: Thank you. Rosana Salvaterra, for the record.

Well, that is an excellent question. We at Peterborough Public Health routinely examine our cancer data and in fact on our website you will find the 2018 Cancer Care Ontario data.

We have rates of cancers that are fairly typical for Ontario, with the one exception of lung cancer rates. They are elevated and it's hard to know what is contributing to that. I mean we do have higher rates -- higher than average rates of commercial tobacco use. So smoking prevalence rates are higher in Peterborough than in the Ontario average. We also have higher rates of alcohol use and problem drinking in Peterborough, and alcohol as well is a carcinogen. So we -- and we know for example we have higher rates of mesothelioma that are related to the industrial use of asbestos in Peterborough.

We have done on occasion -- like with the mesothelioma we have done sort of a deeper dive and in 2012 we actually looked at the neighbourhood surrounding the

footprint, the BWXT former GE site, and that was in the context of the TCE plume that you heard about earlier today. And so we looked at cancers that are associated with exposures to solvents, with the assistance of epidemiologists at Cancer Care Ontario and found nothing. So we did not -- we were not able to detect any higher rates of cancers related at least to the solvent and that is an ongoing -- the plume is still there.

So it is something we look at, it is something we share our data. In fact, my colleague from Public Health Ontario makes data available to us on cancer rates.

In addition, as far as reproductive outcomes go, that is a very good question. The BORN data, there is the BORN database in Ontario that collects perinatal information and we actually were planning to look at that this year. And whenever we do this we make the information available on our website for the public and hope that the public will refer to it and use it.

Did I answer your question?

MEMBER DEMETER: Yes. So you are going to look at the perinatal data this year?

DR. SALVATERRA: We will be looking at

that and we look at the cancer data on an ongoing way and often we will do additional analyses.

MEMBER DEMETER: And in the past has any of the perinatal data concerned you, in previous...

DR. SALVATERRA: No. Rosana Salvaterra speaking, for the record.

No, there hasn't been anything there that has given us concern. But that said, the BORN data is I would say one of the more recent databases. It's still being completed and I know we still have a ways to go to make sure that all providers are actually entering the data locally. So it would be a new database for us, so I can't -- I really don't know yet what I will see once we are able to look at it and ensure that the quality of the data is adequate.

MEMBER DEMETER: Okay. And if I could indulge you for one more question, child health. Do you monitor any health status indicators for children, given the proximity to the school, vulnerability, child development?

DR. SALVATERRA: Rosana Salvaterra speaking.

That is a difficult question to answer.

There are -- the schools themselves do carry on -- do collect data and collect some of the data that you have asked about. It would not routinely be shared with us, but we have been working with schools over the last couple of years. We have made recommendations to the province about joint data collection between public health and boards of education so that we can both access that data.

So we don't have it now, but it is something that we are working towards in the future.

MEMBER DEMETER: Okay. Thank you very much.

THE PRESIDENT: Dr. Salvaterra, I have a question for you.

You submitted an opinion letter to the Peterborough Examiner on February the 18th, titled -- it's after you visited the Toronto BWXT facility. I ask this question based on the interventions we have heard this week, Toronto and here, where we have had many members of the public really, really concerned about the safety and health of their children and their family. Even after hearing from experts from the CNSC, it really didn't give them any reassurance. Now, you will remember this, but just for everyone else's benefit I will just read the last

couple of lines of your letter where it goes:

"Am I safe, is my child safe? Are we safe? To that I can state that the BWXT facility operates with an abundance of safety built right into its design, its administration and its culture. Safety is an active process and depending on how rigorously it is maintained..."

(As read)

Did that give any reassurance to your community?

DR. SALVATERRA: Rosana Salvaterra speaking.

I hope so. I hope so. I mean I have -- there has been a great deal of anxiety and I have had a parent come to me in panic, concerned about her child and wondering if they should move. So there has been a great deal of alarm in the vicinity and I hope I have been able to speak to it and reassure people, but that is why -- that is sort of one of the underlying reasons why I believe, even though it may not be required, it would be helpful to have an independent comprehensive environmental monitoring

program in a way that engages the community so that they don't come just every 10 years, but that there is a relationship that is built and hopefully that it will be that relationship that will reassure the community in the long run.

THE PRESIDENT: Thank you very much.

Any final words for us?

DR. SALVATERRA: No, but thank you very much for allowing us to come and speak with you today.

THE PRESIDENT: Thank you for making the time.

--- Pause

THE PRESIDENT: The next presentation is by Ms Kathryn Campbell, as outlined in CMD 20-H2.109 and 109A.

Ms Campbell, the floor is yours.

CMD 20-H2.109/20-H2.109A

Oral presentation by Kathryn Campbell

MS CAMPBELL: First of all, for the record, my name is Kathryn Campbell. Thank you for this opportunity to express my concerns about BWXT.

In summary -- and I will come back to it of course -- please do not grant their application to manufacture uranium dioxide pellets in Peterborough.

Pelleting will be a death blow to the reputation of Peterborough. We were once an industrial town. Today our top employers are education, health and services. Tourism and outdoor recreation are vital to our economic stability.

Would you rent a cottage, charter a boat or go fishing on the Trent-Severn Waterway if you knew that uranium dioxide pelleting was being done and beryllium emitted nearby? Would you send your child to a postsecondary institution in a town that has a pelleting factory located within a centimetre -- pardon me, it feels like a centimetre it's so close, I live next door to it, it feels too close -- a pelleting factory located within a kilometre of the downtown core?

I want to begin today with some personal information to provide some context for my comments and for my emotions, if they seem to be too much for you.

Specifically, I want to tell you about my father. He worked at GE. He died of cancer in 1985. His workplace was unsafe. In 1971 there was an explosion and a

catastrophic fire. I'm not making that up, it's not aggrandizing, it was a catastrophic fire. Three Peterborough firemen were killed. Afterwards, GE claimed that the factory was safe, but contaminated equipment was not removed until 1975, five years later.

My father was an accountant in charge of capital asset records. As a child, I saw him every morning go out in his crisp white cotton dress shirt, long sleeves in winter, short sleeves in summer, and he made his way around the plant on a regular basis doing inspections to update the plant asset records. He was one of several GE employees who died of multiple myeloma positively linked to the complex contaminants created by the fire, so complex that they did not know how to clean it up in fact.

In Peterborough, there are many families like ours who have lost loved ones to work-related illnesses. GE said to Peterborough families, "Trust us", and then they betrayed that trust. Now BWXT, like GE, says, "Trust us". Why would we trust them?

Under cover of a licence transfer from GE Hitachi in December 2016, BWXT was grandfathered onto the Monaghan Road site. No public disclosure, no public input.

In this licence renewal application, BWXT

claims that they have no plans to start pelleting in Peterborough, but they are already working to fulfil all the necessary licence conditions. I have heard in the last day or so that that may not be quite what is going on, but we had to come here to find out what might be happening maybe sometime in a couple of years. And that is the very point, we don't know. We were told this, then we were told that. "Flexibility" is a very strange word in conditions like this.

When the IEMP data was released in January of 2020, BWXT immediately denied any responsibility for the beryllium found in the yards of our town. And Steve showed you how far afield they were, it's not just Prince of Wales.

BWXT has been in Peterborough three years, two months and 18 days and already they have given us many reasons to distrust them.

Using the format of my written submission, my comments today are organized into four sections: stakeholders, the zone, communications and the future.

Who qualifies as a BWXT stakeholder? Corporate stakeholder theory says that anyone with a special or personal interest in the activities of a

particular corporation is by definition a stakeholder and corporations have a social responsibility to engage with all of those stakeholders.

In a December 2019 newspaper article Mr. MacQuarrie said that he wants to communicate with "all of our stakeholders, especially our community neighbours". That would be me. But in that same article he was dismissive of concerns raised by residents next to the factory. Does he really want to hear from us?

BWXT is doing a terrible job of stakeholder engagement. Three examples.

A barbecue held on a contaminated parking lot is just plain dumb. It comes across to us in the community as petty bribery, "Come and get some free food and see what good folks we are." We know it's contaminated, we don't want to go there.

Their newsletter is glossy propaganda, with none of the substantive information promised to us in their 2019 renewal document about safety and their activities. It is all good stuff, happy employees volunteering. They are not telling us what they said they were going to tell us.

They boast that their stakeholder contact

list has grown significantly from 1,500 in 2016 to 3,700 in 2019. These numbers grossly underestimate the Peterborough stakeholder population.

The real stakeholder community is best delineated by the IEMP test sites for uranium and beryllium. As seen up on the map here, the test data posted in January 2020 provided us with GPS coordinates which map out a two-kilometre radius around BWXT. Anyone within that two-kilometre testing area has legitimate claim to stakeholder status. We call that the zone. In that zone we have 11,871 properties. Conservatively, we estimate more than 2,500 full-time residents and workers.

If BWXT really does want to talk to their stakeholders, they need to send out an awful lot more newsletters.

Okay. So now I will prove I don't know anything about technology. What do I press next? Oh, I know. I just go click. There. Sorry, I always have to talk to my machines.

The zone is where we live, it's where we work, but there is a lot more going on there as well. It has an abundance of natural features, grass-lined boulevards -- grass boulevards, partly, tree-lined streets.

There are 38 municipal parks within that two-kilometre radius. I have just marked out some of them to show you they're everywhere, very close to the plant and all throughout the area.

There is a golf course on the left lower corner. Jackson Creek starts at the upper centre and empties down in the right at Little Lake. The Otonabee River runs down the side and of course we have Little Lake in there as well. We are a very nice, green, friendly city.

You already know about Prince of Wales Elementary School, population 600, across the street, almost within spitting distance, certainly within shouting distance.

There are also other captive vulnerable populations in the zone. There are, as marked here, seven elementary schools, 2,050 students. There are two high schools with 1,600 students. Not marked there because I was running out of arrow space, there are seven retirement homes with some 600 vulnerable residents. And you will see off just to the left side, the large blue area, is the Peterborough Regional Health Centre, our only hospital and in fact our regional hospital within the zone.

Two blocks north of BWXT is a Heritage Conservation District with 354 homes that have been recognized for their unique architectural features and cohesive heritage identity. I have lived in that district for 46 years and it has been a great joy to see old homes lovingly preserved. Pelleting and heritage conservation are not compatible.

In my written submission I gave numerous examples when it seemed to me that the BWXT communications were intentionally deceptive. Slide 4 illustrates that. For speed sake, I will only pass over on this one because George in fact recently talked about this.

BWXT has managed to -- or offers a very deceptive interpretation of the site, located, they say, in a mixed residential, commercial and -- pardon me, mixed industrial, residential and commercial -- I'm getting it wrong again, residential zone.

It's not industrial. BWXT is the only significant industrial player in that whole area, the entire zone. There are two remaining factories. One does window manufacturing in a small mall and one is Genpak that does packaging. It is no longer an industrial site or region.

Sometimes BWXT exaggerates that they are operating safely over 50 years here. They seem to be patting their résumé. They do a lot of things.

I want to do two things and I am not going to be able to do them all, drats.

And finally, a Hail Mary communication, because I think I will have to get to this one. I got this Monday night. A teeny tiny quarter-page note that tells us that we can apply so we can learn more about BWXT. This is not what I would call good communication. What they are asking us to do is come and apply to and we might be selected to come to a Community Liaison Committee. This came out Monday night.

If there is going to be a Community Liaison Committee, I would like to see it with the following structure and mandate.

What will be -- how will BWXT select citizens for the Committee? Who will chair the meeting? Will the Committee have a majority of citizen members? Will the citizen members have voting power? Will the citizens have authority to set agenda items, call for documentation, ask for and receive briefings from senior management? Will documents be provided to the Committee

and also to the public? How will a handful of citizens selected by BWXT fully represent the concerns of thousands of stakeholders? Will there be open public meetings with the Liaison Committee? Will BWXT provide funding for regular dissemination of information? How will differing viewpoints on the Committee be made publicly available?

And one for me that is particularly personal. Building 21 is not an acceptable meeting site. There are too many ghosts and too many sad memories associated with that building.

A Community Liaison Committee will not be a miracle cure. BWXT is going to have to do a great deal of work to regain the trust of Peterborough and they could today if they wanted to begin to rebuild that trust with us by withdrawing their application for pelleting from Peterborough. Thank you.

THE PRESIDENT: Thank you very much for your submission, Ms Campbell.

Dr. Lacroix...?

MEMBER LACROIX: Thank you, Madam Campbell, for your testimony.

BWXT, would you care to respond to Madam Campbell concerning your communication strategy?

MS CUTLER: Natalie Cutler, for the record.

Yes. And I'm glad you received our mailer for a CLC committee registration.

We have this program in Toronto, we have for some time, and we saw that this is the right time to do it here. Like I said, it has been only recently that we have seen concerns in our community, so it made sense to do that and we committed to do that in our CMD submitted in December.

I will try and remember all of the questions that were raised about how that program works.

We select up to 12 members, with priority given to those living closest to the site and made up of individuals that represent a variety of views. So some are representatives of organizations; some are community citizens at large. And we are going to be looking to have that representation be deep and varied.

We do work with our members on agenda items before we hold meetings. We do publicize the meeting minutes, and you can go online to our website at nec.bwxt.com and see the Toronto ones at any time. We do have guest speakers that come to speak with members. And

chairing the meetings are currently in Toronto representatives of BWXT management. We are looking to have a slightly different structure going forward with a co-chair that is external.

Management does attend all meetings. John MacQuarrie, our president, attends as many meetings as he can, almost all of them.

And this is something we're committed to doing because it's obvious that we have work to do here to gain the trust that we recently see has been lost among some.

And you know, we are very proud to host these meetings in our facilities. So the comment about the facility causing angst, that's going to be a tough one for us, because we want to show members that join our committee -- we tour them. We tour them through our site. And everyone has the same reaction. This is so clean; this is so safe-feeling; this is not what I thought. And we're proud to host them. And they feel better once they do that. And we would like to give them that opportunity.

So I'll struggle with that one, but we endeavour to do better.

Thank you.

THE PRESIDENT: Dr. McKinnon?

MEMBER MCKINNON: Yes, thank you. I'd like to just elaborate on the same topic as Dr. Lacroix. And we've touched on it a little bit before, but I think the community liaison committee is very important, you know, but how do you ensure that you're getting the right representation and input? Because, you know, will there be any sort of self-selection involved? It may be very difficult.

So two things came to mind. Would you be willing to engage with the so-called opposition people who might be, you know, very much against the facility? And what has your experience been? Can you borrow any of your experience from having the community liaison committee in Toronto, and what kind of diversity from the community did you get in the participation in that particular committee?

MS CUTLER: Natalie Cutler, for the record.

Toronto, we have representatives of organizations, for example, and community members at large. So we do have a mix. For example, we have a principal of a school in Toronto, we have representatives that work in completely different industries that simply don't know

anything about nuclear. And we encourage that. We want the perspective on our committee of not seeing things through the same lens as we do so that we can better understand how can we make our communications more palatable, more understandable, and so that perspective's important.

We highly encourage any intervenors to consider joining our committee because that's going to be the perspective that holds our feet to the fire of are we doing this the way they feel we should do it to communicate how we do things. And it starts with the tour. It starts with a presentation on who we are and how we do things. And it starts with a tour of our facility to understand what we do.

And so we highly encourage that. We have had some interest already from individuals that we're very pleased to see applications from. And we will be looking to broaden that, make sure it's diverse.

Thank you.

MR. MacQUARRIE: If I can just add to that, this is John MacQuarrie.

So I would say reflecting on our committee in Toronto that generally all the members are very positive

about our business. And maybe that's a problem. Because certainly there have been no signs from that committee that we're not doing everything fairly well. And I guess that's not the case from what we've seen. I think that's apparent.

And so maybe specifically to your question, you know, I forget how you worded it, forgive me, but you know, whether we have people that are critical, I guess, of the operation. And so yeah, I think that's important in both locations, provided that, you know, it's a constructive and productive dialogue, of course.

But I think if I -- you know, personally, if I took away anything from that, it's not so helpful just to have community liaison committee members that are essentially positive about all aspects of one's operation, because you don't really get a full picture of what's going on in the community.

So from my perspective, and we've talked about this, you know, we are going to use the interventions that we have received to try to figure out how we get a collection of views, including those that are, you know, have some strong concerns and want to really understand the business better and maybe are not favourable towards it as

criteria for who we put on that committee. And we're certainly open to input from others, maybe organizations that could help us to figure out how to make the right selection.

MEMBER MCKINNON: Thank you. Because I think the feedback of intervenors like Ms Campbell is a very important test of, you know, the effectiveness of your current communication and, you know, engaging with people who would have opposition would be very positive.

THE PRESIDENT: I don't know if you do so right now in Toronto, but would you consider opening your meetings to anyone who wanted to attend as observers?

MS CUTLER: Natalie Cutler, for the record.

Yes, in fact, we have discussed recently having a framework to allow members of the public who may not want to commit to coming to a number of meetings throughout the year and to the two-year kind of term that we currently have in our terms of reference to join a meeting as an observer to collect what they wish to collect from it and comment and ask questions at the end.

We give a lot of tours, have a lot of meetings and a lot of dialogue. We've given to intervenors

as well, we've opened our doors, and we invite that. It just makes us stronger. It makes us better.

Thank you.

MR. MacQUARRIE: If I could add to that, John MacQuarrie.

So with regard to where we hold the meetings, we've actually had difficulty getting volunteers to join the committee in Toronto. It's been challenging. And so we've actually tried to figure out how we could attract more members. And you know, to do that we've done things like hold meetings elsewhere that might be more interesting to community members.

So as much as what Ms. Cutler said about holding them at our facility, you know, if that's not going to work, then we'll hold them wherever we need to hold them. So we're open to that.

THE PRESIDENT: Thank you.

Dr. Demeter?

MEMBER DEMETER: Thank you for your intervention. My questions have been addressed.

THE PRESIDENT: Dr. Berube?

Okay, thank you for the intervention. Anything else you'd like to add, Ms Campbell?

MS CAMPBELL: Yes, actually I would.

Three years, whatever it is, months and months and months, we had to picket. We had to protest. We had to have a medical officer of health express concerns and say, You need to be talking to us.

I don't think you're still getting the message, and it's rather like the same concern that the First Nation people had. There's a difference between being talked at and talking. And I'm not yet hearing you saying anything about this committee that would indicate that you're going to talk with us and listen to us.

Because we are a committed group that lives here, works here, are being impacted by what you might or might not be doing in our environment. And we don't want to come and be talked to. We want to be engaged with the process, because we will bear -- as Dr. Edwards said -- we bear the risk, you take the reward. And that's a very unequal situation. It's also a power imbalance.

This room is a power imbalance. It's tough to come here and talk about these concerns. And citizens brought into one of these meetings -- and I've sat through a lot of business meetings -- power imbalance in a meeting shuts people up. And if you really do want to hear

from the community, you've got to figure that one out as well.

Thank you.

THE PRESIDENT: Thank you very much.

Our next presentation is by Ms Jennifer Logan, as outlined in CMD 20-H2.117 and 117A.

Ms Logan, over to you.

CMD 20-H2.117/20-H2.117A

Oral presentation by Jennifer Logan

MS LOGAN: For the record, my name is Jennifer Logan.

My presentation is called Thirty-Six Steps.

I have been a member of this community for 20 years. I'm a nurse practitioner, a mother, a neighbour who lives within 500 metres of BWXT. My children attended Prince of Wales School.

In the centre of this slide are steps, footprints, if you will. Throughout this presentation, I want you to think about what 36 steps means to you. To me, 36 steps is the distance it takes for me to walk from my

living room to my favourite chair in the backyard. In this room, 36 steps is how long it takes to walk from this end to the other side of the room.

As we know, BWXT is applying to renew its licence for 10 years with the added option of pelleting.

My concerns:

1. Scope of licence -- one licence, two sites: Toronto and Peterborough.
2. Proximity to Prince of Wales School.
3. Community awareness and involvement in the safety implications and safety plan.
4. Liability and accountability.

Let us start with one licence, two sites: Toronto and Peterborough. My question is: Why? Why one licence? How can one licence cover two sites when the sites are so different? How can that be a good thing for Peterborough? I'm sure this two-for-one deal has financial benefits for BWXT. But as I'm here to speak for the community, please explain how one licence for two sites allows for Peterborough's concerns to be a priority. We want our concerns to be the priority.

And if one licence is to cover two sites, why in your licensing request document, section 1.2, pages

7-8, did you choose two very different presentation styles? One, a true satellite image of the Toronto site on the left, and the other, a hand-drawn sketch of Peterborough on the right. I thought this odd. Did you submit a drawing of the Peterborough site because of its location?

In any case, I was able to find an image for you. Please take particular attention to the red arrows. What were you thinking when I mentioned 36 steps at the start of my presentation? Well, 36 steps is exactly the distance between BWXT, this proposed pelleting site, and the Prince of Wales schoolyard where four- to 13-year-old children play. If we zoomed in closer, we may even see children playing in the playground.

Should we be concerned? Is BWXT too close?

From your safety analysis report, page 3, we learn that BWXT has adopted a safety culture to protect us from the hazardous materials you use or will be using at BWXT, which include among other things, as we've all been talking about today, radioactive uranium dioxide pellets and powder, carcinogenic beryllium, and potentially flammable and explosive compressed gas cylinders which, from the satellite image of the Toronto site, are massive.

Here's the image of the Toronto site again. In the upper right corner is the hydrogen tank, which is 12 metres long, contains 9,000 gallons of liquid hydrogen which, if mixed with flame, is capable of exploding buildings.

Should we be concerned? Is Prince of Wales too close?

In the safety analysis report, page 3, and section 2.4.3 of your licensing request document, page 21, it states that BWXT uses a what-if safety analysis. According to your report, a what-if safety analysis consists of brainstorming sessions to determine what could go wrong in a given operation at BWXT.

Could you elaborate? Could you tell us what could go wrong? What are people living around BWXT to do in these events? How specifically are the students at Prince of Wales to be protected if something should go wrong? Are members of the community, the school board, hospital on your safety council?

That said, I would like BWXT to know that the Peterborough community also has a safety culture that includes what-ifs. Here's my what-if: A group of scientists from Trent University notice rising rates of the

carcinogen beryllium in soil samples at Prince of Wales School -- which is true. What specifically will BWXT do if beryllium levels in the soil at Prince of Wales playground exceed scientifically accepted safety levels?

Which brings me to the question of liability and accountability. BWXT is a tenant on a GE site that is already toxic. Who is liable if something should go wrong now or 20 years from now? Is it BWXT? Is it GE? Or even the CNSC?

Let's take a moment and remember the many workers who died and the families who were affected by exposure to toxic chemicals used at GE, the same site where BWXT is now. GE claimed that it met all the safety standards required of them at the time. But for the GE workers and families, the catastrophic what-ifs actually happened. Unfortunately, the efforts by the employees and their families to receive compensation was extremely difficult, as shown in the critically acclaimed documentary *Town of Widows*.

We are here today because those lost lives and past traumas matter. We care for those workers and families. We have learned to become less trusting, more vigilant. And I ask you now what mechanisms for

compensation are in place for employees, families, and the community should something go wrong now or 20 years from now.

I have asked lots of questions. I have summarized them at the end of this presentation to be answered at the end or in writing later. With questions, there are recommendations.

In my heart, I would not like this licence to be granted. BWXT is too close to Prince of Wales and many homes in this community. I believe the risk to our community and our children outweigh the potential financial returns to stockholders of BWXT.

In the event you choose to disregard Peterborough's concerns and carry on with this licence, here at the very least are my recommendations.

- Identification of the source of increasing rates of beryllium at Prince of Wales School and remediation of contaminated lands.

- Independent environmental monitoring.

- Licensing applications specific to Peterborough's site, with transparent development plan.

- Community members on BWXT's safety committee.

- Establishment of a community restitution fund in the event of an industrial accident at the plant to be co-managed by BWXT and the community.

Thank you for listening to my presentation. In conclusion, I want again for you to think of the 36 steps. As far as I know, no one has studied the short- or long-term health effects of children playing in a playground so close to a factory that uses hazardous materials like beryllium and uranium dioxide powder. Our community does not want our children to be unknowing guinea pigs in a potential life-devastating experiment. Think of your own children, your grandchildren. Would you like them playing 36 steps from a factory that uses these toxic chemicals?

THE PRESIDENT: Thank you very much, Ms Logan.

Dr. McKinnon?

MEMBER MCKINNON: Yeah, thank you for your perspective. One area that struck me was, you know, the description of the what-if scenarios and how they're determined. Because I think it's very true that different people will perceive, you know, different hazards with different priorities. And so if you have a very closed

group, it could limit that.

So my question is to the company. When you're developing your what-if scenarios for your risk assessments, how do you actually do that? Is it something within the company? And how do you broaden that perspective? And do you have any independent check in developing that?

MR. SNOPEK: Dave Snopek, for the record.

A what-if analysis is just that. It's a group that looks at -- I'll back up.

What we first do is we look at our processes in segments or areas. And the idea of the what-if analysis, which is one available tool -- another tool would be the hazard inoperability study or a HAZOP study. So in some cases, we use a HAZOP study, in some cases we do a what-if analysis. It tends to be, for the simpler operations, a what-if analysis tends to be used. For the more complex operations, a HAZOP is more suitable.

But the objective of both is to identify hazards that can develop in these certain areas if you try and break the process down into kind of bite-size areas and look at them one at a time. And it asks questions like, you know, What happens if packages are damaged or dropped?

What happens if a fire occurs in this area? What happens if a large fire occurs in this area? Or if there's a spill of material? With compressed gas cylinders, what happens if there's a failure of that and there's a pinwheel or a projectile?

And it's not done in isolation. This is something that we have done as part of our safety cases, where we bring in a third-party consultant to help us with that. We bring in Arcadis to do that, as we do for the HAZOPs and any kind of downstream quantitative assessment for our safety analysis.

MEMBER MCKINNON: Okay, but for example, all the things that you just mentioned, I would say they're very industrial type of hazards. And you know, if I were in the shoes of Ms Logan, I would want to know, you know, if my children were playing near the plant and there was something to occur, what would be the potential hazards and the risks to them. How do you include, you know, the non-industrial perspective in the what-if scenarios?

MR. SNOPEK: Dave Snopek, for the record. The what-if scenarios and the HAZOP studies are those preliminary hazard identification techniques. They're a screening tool. So they're done in

a qualitative way, and they're meant to identify those hazards that progress for further analysis. And some of those hazards do.

So the qualitative review, which is the what-if or the HAZOP, might identify let's say a fire scenario or let's say a compressed gas scenario with the potential for, let's say, off-site consequences. Then that would progress to a more quantitative review of what both the consequence and the likelihood of that scenario is. And it's that quantitative review that will give you potential impacts on site and off site.

And we summarized kind of the worst-case scenarios in the presentation slides that we made yesterday morning. That was an output of the quantitative review for hazards both in Toronto and in Peterborough.

MEMBER MCKINNON: And that segues to just a final question I have related to exactly what you were just talking about.

In your presentation, you mentioned some of the hazard scenarios, such as catastrophic fire, and you had a potential frequency, every 3,700 years. So that's a very, you know, particular number, instead of 4,000.

So where do those numbers come from? Are

there standard industry accepted procedures that you're referring to to, you know, obtain those numbers?

MR. SNOPEK: Yeah, Dave Snopek, for the record.

I will pass this back to Doug Chambers from Arcadis who produced the quantitative reports that led to those numbers.

MR. CHAMBERS: Doug Chambers, for the record.

Yes, there's a great deal of industrial experience around the world, and this is published. And we draw relevant statistics from chemical engineering documents, for example, and documents of U.S. Department of Energy where they compile statistics on similar experience throughout the world, pipe break, for example. And then we fold that into our chain of looking at what the likelihood is.

And yes, you're quite right, 3,700 should be rounded to 4,000, so that's something we should have done.

MEMBER MCKINNON: Yeah, I know it won't change the conclusion, but it's -- I was just curious where they came from and, you know, there's definitely a

methodology behind it. It's widely established and accepted.

MR. CHAMBERS: Doug Chambers, for the record.

That's correct. It's a generic methodology. Virtually anyone in the industry would follow a similar approach adopting it for a specific process.

THE PRESIDENT: Dr. Demeter.

MEMBER DEMETER: Thank you for your intervention.

And as you might have heard, there's been a lot of discussion about the beryllium and I think there's been significant movement on that.

There was a discussion earlier about one versus two licences that I had initiated as well. And I think it might be good to hear from a safety and security point of view -- the staff have previously discussed that the approach to one site versus two sites from a safety and security point of view is irrespective of whether it's one licence or two licences, and I think that maybe they could summarize that for you succinctly that that doesn't -- it doesn't interfere with the safety and security components of oversight.

But I think I'll let them...

MS TADROS: Haidy Tadros, for the record.

So yes, thank you. As we had looked at this question and recognizing that, typically, intervenors wouldn't see it from sort of a regulatory and administrative perspective and that is acknowledged.

Our perspective on this is through one licence, there is a recognition that the assessments that we go through that the risks that are analyzed referred to mitigated and the programs that we see, all of that is encompassing under one management system and one entity, in this case BWXT.

We do have other examples of licences that have one site, but so that we are clear with regards to BWXT, there would be no added safety in terms of splitting it into two licences, so what staff are recommending and as per the considerations and the Commission's decision back in 2010 when this question was brought forward, the same considerations that existed then exist today.

BWXT has not changed their operations. They function under one management system with clear responsibilities of who's doing what at what site.

There is very much an efficiency gain from

a regulatory oversight perspective to ensure that we can challenge and corroborate what goes on in both locations under one licence and reporting on performance is very efficient when you can report on the entity that is delivering the activities.

The licence activities that are authorized are in tandem. They come together. They complement each other based on the industry that is being regulated in this case.

Where the differences are there and where regulatory oversight has been very specific to the facility in mind is areas such as the public information disclosure program. Areas such as action limits, release limits, those are specific to the operations that are facility specific, they are site specific, and obviously community specific in this case.

And in those cases, we have, according to our licence and our Licence Condition Handbook structure, the ability to go into the different communities and verify compliance according to the programs that best suit those locations.

So the current structure as it exists with the licence, the programs, the Licence Condition Handbook

are very conducive to one licence. Safety is not compromised in any way. And I can ask -- add any further questions.

MEMBER DEMETER: Yeah, so the one message that I heard that I think is important is that, you know, the oversight is going to be such that safety's not compromised at the site, but the way that you interact with the community, the way you public disclosure and information, is not hampered by having one generic licence. It will be based on the uniqueness of that site and that community that you're -- at least there's -- obviously there's ways -- there's criteria for public disclosure and community, but if the two communities are very different, you may have to take that into account. And one licence versus two licence doesn't hamper you from communicating in different ways to different sites.

MS TADROS: Haidy Tadros, for the record.

That's absolutely the case. It's not just it hampers us; it gives us more ammunition to go back to the licensee because they are responsible for their public information disclosure programs as per the community that they're in.

MEMBER DEMETER: Thank you.

Does that help you with the one-two licensing?

MS LOGAN: I had a couple of other questions in my presentation, and it was who was liable now that you're a tenant of GE and if something should go wrong, is it BWXT or GE or CNSC based on the --

THE PRESIDENT: So that's a different issue. I think Dr. Demeter just wanted confirmation that you understood the rationale --

MS LOGAN: Yes.

THE PRESIDENT: -- for the one or two licence.

MS LOGAN: I understand.

THE PRESIDENT: We'll get to your other question.

MS LOGAN: All right.

THE PRESIDENT: Dr. Berube.

MEMBER BERUBE: Well, thank you for your intervention.

Actually, because we were just talking about hazards, I just wanted to go to your recommendation on safety committee inclusion.

I'm wondering if BWXT can tell me about

the composition of their safety committee and, you know, who's on it, what is their roles, what is their primary function.

THE PRESIDENT: Sorry, before you answer that, did you mean the safety committee or the liaison committee?

MS LOGAN: It was the safety committee.

MR. SNOPEK: Dave Snopek, for the record.

So at both of our sites, we have a workplace safety committee. On that committee are representatives of management as well as representatives of the workers.

The composition of that committee is such that at least half of the committee are workers.

We have representatives from all the unions, and they meet, I believe, it's close to 12 times per year to review performance, safety performance, to review events, to discuss improvements. They take training. They review aspects of the *Canada Labour Code* to make sure that they're well informed on elements that apply to our facility, and they receive training on the duties of the employer and of the employee with respect to safety under the *Canada Labour Code*.

So they're an important part of our safety system because it allows that communication between the different parts of the business, management as well as the workers.

It's co-chaired where one chair is a member of management and the other chair is a member of the workforce.

MEMBER BERUBE: So just purpose for the committee, basically, was proactive to try to prevent accidents; correct?

MR. SNOPEK: Dave Snopek, for the record.

Absolutely. And that's -- in doing that, they're looking at our safety program, they're looking at things that we can improve. They're looking at events so that we can make improvements and not incur similar events in future.

MEMBER BERUBE: So do you bring in third party consultants sometimes if you get stuck with something that really needs extra attention?

How do you expand your knowledge base other than internally? Is there -- you would go through that with the safety committee, I would think.

MR. SNOPEK: Yeah, Dave Snopek, for the

record.

We've had items brought to the safety committee in the past. I'm thinking of in Toronto there was a concern that was brought up by the workforce. It was brought up to the workplace safety committee.

And they went through it and they kind of wrestled with it, and it was clear that we needed more information so we brought in a third party consultant, provided lots of time with the workplace safety committee and, actually, it went -- it actually -- we used the same tool.

We had the consultant talk with the entire workforce so that it was clear. This had to do with the concern of radon and the question was brought up, as it has been brought up here.

We deal with uranium, and when you look up uranium on, you know, a Google search, you often get things to do with mines and whatnot where you have the radon component of a decay chain of uranium. Of course, in our facilities that's been interrupted because of the refinement of the material part when we get it.

But we wanted to make sure that that information was coming from a very credible source with an

expert third party consultant and that it could be delivered in a way that it gave comfort to the workplace safety committee as well as the workers, so we absolutely do that.

MEMBER BERUBE: And so this is sort of like a standard safety committee type thing.

So how would you think that you would integrate external bodies into what's clearly a very internal process?

MS LOGAN: I think I was leaning into the -- sort of the what if case scenario, so if there's a "what if" that might concern the students or something outside of the organization, how are they incorporating that? Let's say, for example, someone from the hospital or someone from the school board given that this is located 36 steps away from BWXT.

I think that would also add to the trust if they know what the safety plan is and what their role is in the safety plan.

MEMBER BERUBE: So you're worried about the proactive possibility of public safety.

MS LOGAN: Yes.

MEMBER BERUBE: Okay. And how do you

accommodate for that with your safety committee?

MR. MacQUARRIE: John MacQuarrie, for the record.

So in our view, that would be a good topic of discussion for the community liaison committee, which would have members of the company, of course, but members of the community. And I think we could go through a full review of our safety analysis and all the various techniques that we use and get consultation from the members of that community or from special invited guests and have a thorough review of it at that forum, which I think would be a good place to do it.

THE PRESIDENT: Thank you.

Dr. Lacroix.

So getting to your question on who is liable if something bad happened, and I'll turn that to you, Mr. MacQuarrie, because you answered that in Toronto.

MR. MacQUARRIE: So John MacQuarrie.

Yeah. So BWXT is liable for our operations and for any impact that we would have on the community and the event that causes impact on the community, so that is our liability.

And to expand on that, as I've said

before, we are -- we carry insurance. We carry a considerable amount of insurance by a group of large insurance companies. It's a large amount of insurance. We feel we're well insured.

We also have a significant capability within our company to deal with events should they happen, so we feel we're well positioned to be able to manage any events that might occur.

THE PRESIDENT: Staff, have you reviewed BWXT's insurance coverage for adequacy? Is that something you do?

MS TADROS: Haidy Tadros, for the record. No, it would not be something that we do.

THE PRESIDENT: And say if something happened, I don't know, 50 years from now. That's when they find some legacy issue. And if BWXT's not around, who's liable then?

MS TADROS: Haidy Tadros, for the record. Whoever owns the land would be liable at that time if BWXT is not around.

We have one example that we can share. The Port Hope, for example, the Government of Canada has taken ownership of that because of the Crown corporation

that was in place and is currently in the process of remediating and cleaning up the land through the licences that are issued by the CNSC.

THE PRESIDENT: So it's the owner of the land even though it is the neighbourhood that has the issue.

So in this particular case, say GE, you know, BWXT has decommissioned their property and moved out, GE's the landlord, but there are some residential areas that suddenly find contamination that had not been detected before. You're saying GE as the landlord of this facility would be liable?

MS TADROS: Haidy Tadros, for the record.

That is correct. For confirmation, perhaps Ms Karine Glenn can provide the details.

MS GLENN: Good afternoon. My name is Karine Glenn, and I'm the Director of Waste and Decommissioning here at the CNSC.

So when we look at what's required for decommissioning, we're looking at known areas. And normally it is the site unless there has been determination that off-site areas have been contaminated, and those are the result of the licensee's activities and that can be

demonstrated. Then that would need to potentially be covered through some means.

However, typically in the -- what we review as the decommissioning plan is for the site itself and to render the licence site back to a pre-determined end state.

And at the time of decommissioning, which needs to be authorized by the Commission, so those decommissioning activities need to be authorized by the Commission, there would be -- when the decommissioning activities are complete, the licensee would need to come before the Commission again, present the results of that decommissioning in order to be released by the Commission from the CNSC's oversight.

So they would need to demonstrate that they've remediated everything to the pre-determined objectives and the end state and that there's no more licensable quantities of radioactive materials on the site.

Perhaps we can ask our colleagues from Natural Resources Canada if they have anything to add with respect to off-site areas that may be discovered years down the road after a site has been decommissioned and released from licensing.

MR. FAIRCHILD: Jamie Fairchild, Natural Resources Canada, for the record.

With respect to liability legislative coverage in the event of an accident, the *Nuclear Liability and Compensation Act* would hypothetically apply. The international standard for damages to be compensated in the event, I need to characterize it again, of an accident or an incident is up to 30 years from the date of that particular accident.

I think we've mentioned the Port Hope Area Initiative, which is beyond my area of expertise, as an example where there were legacy issues beyond a licensed site from the regulatory.

This is something I'd be pleased to take back to my colleagues and report back on in the next day or so.

THE PRESIDENT: I think that would be very helpful because it's a concern that's come up over and over again, so it's not the licensed facility we're concerned about. I think that's been answered adequately. It really is off-site facilities way after the licence has terminated.

Mr. Ramzi Jammal?

MR. JAMMAL: Thank you, Madam Chair.

I just want to make clarity here. The -- we know the NLCA does not apply, so that's not given perception, so I respect my colleague's comments.

There's one thing I would like to reiterate. The fact that your question is what happens off-site, if there is a non-existence of a BWXT or a landowner or a private entity, the Commission will exist -- so in other words, the Commission has ordered the municipality to conduct clean-ups. The Commission has ordered landowners to conduct clean-up on site and off site, so if there are contamination that requires licensing and oversight by the Commission, the Commission has the powers under the Act to order any entity to do the clean-up.

So we were able to exercise on many occasions, especially in fixed gauges area, where the licensee no longer exist or potential contamination, but the powers of the law, of the NSCA, gives the Commission the power to order any entity to --

THE PRESIDENT: But my scenario here, Mr. Jammal, is BWXT isn't around any more and contamination is found off site that's traced back to their operations 30

years prior to that. They're not around. There is no nuclear liability coverage.

Who is accountable for that clean-up? Who would the CNSC go to to say "Fix that"?

MR. JAMMAL: Ramzi Jammal, for the record.

The Commission has every right to order again the municipality in order to do that clean-up, so whoever ends up being the entity that we feel should carry out that clean-up --

THE PRESIDENT: But don't give me hypothetical ones. Talk about this very specific licensee, Peterborough. Who would the CNSC go to?

MR. JAMMAL: Ramzi Jammal, for the record.

If GE is still the landowner, so we go to landowner GE and we order them to do clean-up off site.

THE PRESIDENT: So whoever is the landlord of the original facility is the one that would be liable?

MR. JAMMAL: Pardon me? Sorry?

THE PRESIDENT: It's whoever is the landlord of the original facility that was deemed responsible for that contamination is the one who would be liable for the clean-up? Is that what you're saying?

MR. JAMMAL: Ramzi Jammal, for the record.

And we had the experience of -- in Ontario, so we had DELORO, we had many of these sites, where no longer licensees exist, so the provincial government was ordered by the CNSC to do the clean-up according to our requirements.

THE PRESIDENT: So can we ask staff to just confirm that and take that as an undertaking and then just verify that what you have said is the way it would be?

There will be someone liable, BWXT while they're operating it and, after that, it's whoever's the landlord of that particular facility.

MS LOGAN: Thank you.

THE PRESIDENT: Okay. You have the last word, then.

MS LOGAN: I just wanted to thank everyone for listening to my presentation and also thank you to the Peterborough community for taking this seriously and coming here for the three days. Thank you.

THE PRESIDENT: Thank you for your intervention.

I'm sorry, Ms. Jordan. I think we're going to take a break now and then -- does that work for you?

MS JORDAN: Yeah.

THE PRESIDENT: Okay. So we'll take a break now and be back at 10 to 4:00.

--- Upon recessing at 3:34 p.m. /

Suspension à 15 h 34

--- Upon resuming at 3:50 p.m. /

Reprise à 15 h 50

THE PRESIDENT: Our next presentation is by Ms Dana Jordan, as outlined in CMD 20-H2.120 and 120A.

Ms Jordan, the floor is yours. Thank you.

CMD 20-H2.120/20-H2.120A

Oral presentation by Dana Jordan

MS JORDAN: Good afternoon. My name is Dana Jordan, for the record.

I am a 16-year old student and concerned citizen of Peterborough, Ontario, here to speak today with concern to the BWXT Nuclear Energy Canada Incorporation manufacturing site in Peterborough, Ontario.

I know that this site incorporation

assembles fuel bundles for CANDU reactors and currently BWXT NEC is applying to have the capability of moving its production of natural uranium pellets from its facility in Toronto to the Peterborough site.

As a citizen of Peterborough living nearby to the BWXT NEC site, I'm particularly concerned with the potential negative health impacts on those living in my community. I resolve that these concerns be addressed by a non-partisan, in-depth and publicly accessible inquiry into health and safety measures conducted in a fair manner.

If these findings are to be in violation of the Canadian Charter of Rights and Freedoms, Section 7, Part 1 of the *Constitution Act, 1982* or the *Occupational Health and Safety Act* of 1990, I further ask of you to do all that is within your power to prevent a potentially real threat becoming a reality.

So the first community meeting held by the organization Citizens Against Radioactive Neighbourhoods, or CARN, drew over 225 people and since then many dedicated folks have been out rallying and getting the attention of the community.

And although I have been to a few of these rallies, I have been in and outside of this community and

being concerned by the pelleting, I learned that there is uranium with radioactive properties that will remain radioactive in human bodies because of its long physical half-life. Also, normal functioning of the kidney, brain, liver, heart and other numerous systems can be affected by uranium exposure because uranium is a toxic metal capable of causing long-term health effects.

Therefore, with respect to the issues raised at this meeting which I attended, I'm actually fearful of the prospect of nuclear production in my community and urge BWXT's application to be rejected specifically on the grounds of the inherent danger to human life and environmental prosperity that this would entail.

So BWXT NEC has requested the Canadian Nuclear Safety Commission, or CNSC, to renew their 10-year uranium pelleting production licence for the Peterborough site in 2020. Peterborough citizens like myself are especially concerned about this prospect since very little information has been released to the public despite BWXT's public disclosure protocol, which promises the provision of inherent on their licensed activities to persons living near the site, fostering public awareness and providing a forum for community members to discuss issues and concerns

related to these licensed facilities.

This public disclosure protocol also talks about consultation with stakeholders and two-way communication, which to date has been woefully inadequate by our findings.

It is my understanding that microscopic and undetectable carcinogenic particles will be released into the air through their uranium production if it is to continue. And if workers are not adequately protected and the uranium dust escapes from this manufacturing facility into the environment, which it would probably be almost impossible for it not to happen, there could be a real and serious threat to those in nearby neighbourhoods if ingested.

For example, there are two elementary schools, Prince of Wales literally across the street, and my former public school which I went to, Queen Mary, approximately 1.5 kilometres from the site.

The health of many people, including the workers at BWXT and families with children and pregnant women, could be put at risk of developing cancer or other serious related illnesses if they were to inhale this uranium dust.

So CARN, on behalf of concerned citizens such as myself, and I politely ask for an environmental assessment. I feel that an EA would explain the risks associated with bringing the uranium pellet production to Peterborough and that it would make available to the public all of the information and facts that are crucial to know.

It is also important for BWXT to hold public meetings during which citizens can hear directly from company representatives and ask questions regarding the proposed production of uranium pellets in Peterborough.

In addition, it would be helpful for representatives from CNSC and the Ministries of Labour and the Environment to also be present at these public meetings and have a voice there.

Many families in Peterborough have loved ones who have died or become seriously ill as a result of the exposure to asbestos in GE's Peterborough site, which is to be the BWXT site as well, when it was previously run by General Electric. This tragedy still resonates in our community and in the minds and hearts of people who were affected. So we don't want history to repeat itself.

I also strongly believe that it is our right to know about any hazards resulting from operations

in Peterborough and protective measures that will keep in place people nearby and all of the neighbourhoods healthy and safe.

I therefore respectfully ask that you ensure that concerned citizens are addressed as part of the CNSC review of the BWXT NEC's request to expand its uranium pellet manufacturing within this community.

Thank you.

THE PRESIDENT: Thank you for your submission.

Dr. Demeter.

MEMBER DEMETER: Thank you very much. I very much appreciated both the written and the presentation that you just did.

I sort of got two threads in your presentation and maybe we can find some middle ground.

One was a strong message that no pelleting in Peterborough. Then at the end you talked about if there's going to be pelleting, then we need to have these forums and these discussions and have the environmental assessment.

Is there a middle ground that you would find the pelleting operation acceptable if it met your risk

reception? I'm just curious because it seemed to be you had both messages.

MS JORDAN: Dana Jordan, for the record.

I believe that in terms of moving forward there might need to be a transition energy from all of what I've heard, but I'm not sure if nuclear is the only way. And if it's seen to be by the government, that might be why we need to use it. I'm not sure if that's how it is or not, but it seems to be that way, given the fact that BWXT is already operating.

So I would definitely be against pelleting because of the inherent dangers of it. And like all nuclear, I think it would be better to transition entirely to green, if that was feasible, and use renewables.

But right now, like nuclear is already in production in Peterborough. So I don't know if that's reversible or even if every single community member came forward with these concerns, if that would be done by the people in power.

I am of the strong belief through my studies that renewable energy is definitely the way to go. But if this is the only transition that we have, we need to make sure that it's safe and responsible for everybody

involved.

MEMBER DEMETER: Thank you for that. That's actually quite a pragmatic approach to the situation.

We have had a lot of discussion, both in the Toronto phase and this phase, about public disclosure and information and the need to significantly enhance that to communities.

Thank you very much for your presentation.

THE PRESIDENT: Dr. Berube.

MEMBER BERUBE: Thanks for coming. Just a personal comment first. My son is your age and there's no way he could have done what you just did. So congratulations on that. It takes a tremendous amount of courage to come and talk to a bunch of people like us about this. So good on you. You should applaud yourself and I certainly do.

I want to ask you: What brought you here? Why did you feel compelled to come and talk to us? What is your chief concern? What is your biggest fear here? Why do you need to be here talking to us about this?

MS JORDAN: Dana Jordan, for the record.

Personally it's very important to me. As

a YLS graduate I studied leadership and sustainability and looked directly at world issues. I have extreme passion for the environment. I want to be an environmental lawyer. So I think getting involved at the grassroots in my community, as I have with delegating city council and being on the Environmental Advisory Committee, are things that pull at my heart strings and also that are just fundamentally required to have a sustainable community to live in.

I just feel that if I can help in any way that is something that is a duty for me to do.

But also, as I say, with my specialized concern, I have loved ones living directly in this neighbourhood, and I know there's so many children that could be impacted that I need to look at.

MEMBER BERUBE: That's a big list. And there's not a lot of environmental lawyers that come before us, by the way, so you've beaten them out already.

CNSC, how do we address the concerns of this young lady? How do we express to her that we're doing our homework and that things are squared away?

MS TADROS: Haidy Tadros, for the record.

I think one of the main things that we

have heard and I have heard is the fact that safety is of utmost concern to everybody. I think we need to work better together on what we all agree with and how we can pull together and understand different perspectives of what that means because I think there's a commonality here, and it is safety.

Maybe by building on that commonality we can find a way to work through it.

Directly within the mechanisms and the activities we do, as you have heard and as we have continued to say, while BWXT has a huge portion of work to do in their own communities as the regulator, and one that values itself to be for the public good, we would need to up our game on how we communicate what we do, find the mechanisms that work.

The word targeted comes to mind. We do a lot already, but what more can we do to bring that conversation to the community and do more listening than more talking?

So these are things we are going to go away with and try to come back with tangible mechanisms.

MEMBER BERUBE: While we are discussing with CNSC, she has brought out this idea of long-term

sustainability.

Would you please explain how your work leads to the sustainable development of this and long-term sustainability period in terms of protection of the environment?

MS TADROS: So maybe I will start and ask our environmental protection specialists to speak to it.

One of the things that the CNSC speaks to tremendously is the lifecycle approach. We are a lifecycle regulator. Our regulatory framework is built such that it is a framework that looks at not what company is here, what company is there, it looks at the protection of the activities based on the nuclear material and the nuclear energy that is used from the time that it is mined from the ground to the time that it is disposed of.

So with that lifecycle approach there is a concept of sustainability there from the perspective of we need to look at it all, all the time.

One of the other angles of sustainability is public awareness; to ensure that from a knowledge management, knowledge transfer perspective there is the generations that come because of what we do and because of the products and materials that we regulate, they are going

to be around for a while, whether they be in the background or whether they be through industry.

So perhaps our environmental protection specialists can speak a little bit more from their perspective in terms of sustainability as well.

MR. RINKER: Mike Rinker, for the record.

I guess there's a few examples where we incorporate elements of sustainability into our regulatory framework. One of them is a requirement for mitigation measures for pollution to be best available technology that are economically achievable. So we expect the technologies to minimize releases of pollution to be the best that's available.

That works together with the principle of ALARA, as low as reasonably achievable. So despite, for example, a licensee having releases that are below limits, we expect them to have a program that further and continually optimizes and improves their processes to continually reduce worker exposure and to reduce releases to the environment.

And something in parallel to that that works as a lifecycle regulator -- which is different than other approvals. The lifecycle regulator means that we

don't issue a permit or a licence to continue operating and leave the facility, we continue to have regulatory oversight. Licences aren't for operating the facility, licences are for a period of operation.

So during that period if we saw something that we didn't like or we didn't think was up to modern standards, then we can require adaptive management. And adaptive management is a core element of sustainability.

And finally, the polluter pays principle is really important. So we require financial guarantees. We require licensees to not only adhere to the principle of pollution prevention, which is like ALARA, but also they are responsible, like we discussed before, to do any clean-up of pollution should it occur.

MEMBER BERUBE: Does that help you out with any of your questions?

MS JORDAN: I thought that was a really great question for you to ask.

Yes, as the lifecycle approach goes, it reminded me of sort of confusion that I carried on from the last presentation.

Do you mind if I ask a question?

MEMBER BERUBE: Sure.

MS JORDAN: Okay. So can you ensure that the City of Peterborough, namely the future taxpayers, which would include today's youth such as myself, will not be held liable for the remediation costs in the future?

If it were to go to the landlords, would that carry on to the city and the taxpayers?

I was just a bit confused about that.

MEMBER BERUBE: So, CNSC, maybe you want to talk about the financial security --

MS JORDAN: If it is a lifecycle approach like they would be responsible in the future.

MEMBER BERUBE: Maybe you can talk about the decommissioning and the reason why we do that.

MS TADROS: Haidy Tadros, for the record.

So we have our experts in Ottawa who look at preliminary decommissioning plans and detailed decommissioning plans and are involved in the waste management in general.

So with that, Ottawa, over to you, please.

MS GLENN: Good afternoon. Karine Glenn, for the record.

So all licensees are required to provide financial guarantees to ensure that decommissioning of the

facility can occur in the event that they are unable to complete the activity themselves.

So if BWXT, for instance, was to go bankrupt, a financial guarantee is payable to the Commission. The Commission could call upon that financial guarantee and then use the money to make sure that the site is fully cleaned up and decommissioned to return it back to the end state objective.

That includes all the costs of the long-term management of any waste that would be generated.

This is a perfect opportunity for me to circle back to a question that Dr. Berube asked on Tuesday.

So two points I wanted to confirm: to reassure the Commission that in the event that the licensee goes bankrupt, the instrument is payable. The surety bond is explicitly written in a way that explicitly states that if the licensee was to go bankrupt, the bond is payable.

That is actually the very purpose of why we and the Commission impose a financial guarantee for decommissioning. It's not for the licensee to fund their actual decommissioning but rather it's to ensure there are funds should they no longer be available to decommission their facility.

The second question I wanted to respond to, Dr. Berube, was about whether or not the bondholder is insured in case of bankruptcy; so whether or not the insurance company that provides the bond, should they go bankrupt, do they have insurance?

And the short answer is no. The insurance company providing the bond is not insured by another party in case of bankruptcy.

But that being said, the insurance company, in this case Aviva, is a federally regulated financial institution under the oversight of the Office of the Superintendent of Financial Institutions.

Furthermore, in order to mitigate the risk, the CNSC requires the licensee to provide with their proposal, and on an annual basis, the financial rating of the bond issuer.

In the case of Aviva, they have a Class A rating, which is the highest rating that can be given out. It's a mark of its financial strength and reliability. This rating is one of the many parameters that are reviewed by CNSC staff, and our financial advisors have assessed the bond issuer to be acceptable.

Should the rating of the bond issuer

change and decrease, CNSC staff can request that BWXT submit a new instrument from a financial institution with a rating that meets our expectations.

Finally, should the bond issuer go bankrupt, BWXT is obligated to provide the CNSC with a new instrument to ensure ongoing compliance with the conditions of their licence.

So that closes off a couple of issues that we had discussed while the Commission was in Toronto.

But I want to reassure that from a lifecycle perspective there are funds to ensure that the site will be decommissioned to the predetermined end state and that all of the waste will be managed in the long term in a safe manner.

THE PRESIDENT: Dr. Lacroix.

MEMBER LACROIX: Thank you very much, Ms Jordan, for your presentation.

In your written submission you raised a point that no one else has raised thus far and I found it fascinating and interesting. It is the fact that the negative health effects of nuclear energy could be in violation of the Canadian Charter of Rights and Freedom.

I would like to have the legal advice or

legal perception of staff on this matter.

MS TADROS: Haidy Tadros, for the record.
We will get you that information.

THE PRESIDENT: Dr. McKinnon.

MEMBER MCKINNON: Yes, thank you for
coming and representing your age group.

The issues we are talking about do have
long-term effects and something that has been touched on
that is related to that is sustainability. We haven't
talked about it too much but it often comes up in
discussions of environmental issues.

Sustainability is something like safety
culture. It may mean different things to different people.

So I would like to ask the company: What
is your interpretation of sustainability and how you are
dealing with that for the future of Peterborough?

MR. MacQUARRIE: John MacQuarrie, for the
record.

I will preface this by saying that we
don't have a formalized sustainability policy, but I will
give you my view on how the company behaves in that regard.

Our view is that we need to operate and
not have a long-term impact on the environment around us.

I'm just going to speak external to the company, not our employees.

So we need to ensure that what we're doing isn't causing long-term impact, negative impact, to the community around us. So we monitor our business and control our business to ensure that we don't have that happen.

I think if you look at our operations, these two licensed operations, and look at the very long track record that we have had since the mid-1960s, we are seeing both in everything that we measure and what the CNSC measures, we are not seeing a build-up of say uranium in the community around the facility in Toronto. There's no evidence that we are seeing any build-up of uranium in the water system anywhere in Toronto.

If you look at Peterborough, we are not seeing any -- other than this recent data on beryllium, which we have had a lot of discussion about and we have some questions about, we are not seeing any indication that there is any contribution to uranium in the community or any other hazardous material.

So we feel that despite very long-term operations, we are not having a negative impact on the

community.

THE PRESIDENT: Ms Jordan, over to you for any final comments.

MS JORDAN: To that point about the water in the community, I was under the impression that a lot of water gets used during the processes -- I'm not sure of the specifics -- to cool down the uranium perhaps and it is then flushed out into the sewer system of Peterborough.

I'm not sure if it continues to be harmful after that. But I do know that a lot of water is used in the productions.

I was wondering if you could just elaborate a little bit on that.

THE PRESIDENT: In the interests of time, these are questions the Commission needs to have answers to for us to make our decision. We have actually discussed that quite extensively when we talked about environmental monitoring. So you will just have to wait and see what the answer is. But it has been answered.

Again thank you for your intervention and thank you for coming today.

MS JORDAN: Thank you.

THE PRESIDENT: Moving on to our next

presentation, it is by Mr. Peter Harris, as outlined in CMD 20-H2.121 and 121A.

Mr. Harris, the floor is yours.

CMD 20-H2.121/20-H2.121A

Oral presentation by Peter Harris

MR. HARRIS: Thank you very much.

And well done, Dana. I think you are going to make me look bad here.

My name is Peter Harris. I am a neighbour of BWXT in Peterborough. My children attended Prince of Wales and, as you can see from the image on your screens, Prince of Wales junior playground is in the foreground and BWXT is in the background. The distance between the two is 25 metres.

I have submitted interventions to the CNSC previously and my submissions have emphasized the failure of BWXT's predecessor to communicate with its neighbours under its licence obligations. This has been a continual theme at CNSC hearings and it has even been the subject of a Member of Parliament's request for a public hearing.

I live approximately 800 metres from this

plant and have never received any printed materials from BWXT. More importantly I live within the catchment area of Prince of Wales School. BWXT, as was the case with GE Hitachi, has not defined its target audience, a licence requirement.

BWXT delegates Canada Post to deliver its materials. Once BWXT passes them to Canada Post, neither BWXT nor the CNSC measures if there has been successful communication. In my mind this is an easily quantifiable performance objective.

Perhaps the most serious communication issue is BWXT's repeated misrepresentation of their intentions. BWXT writes on its website that BWXT NEC is seeking the flexibility during the proposed next 10-year licence period to permit BWXT NEC to produce natural uranium pellets.

The word "flexibility" is used repeatedly here.

Unfortunately this phrase was repeated so often in the media, together with "there are no business plans to manufacture pellets in Peterborough at this time" that it created confusion as to BWXT's intentions.

It wasn't only the media that was party to

this. "I have also been assured that there are no plans to move their pelleting plant operation to this plant" is a direct quote from Peterborough's Mayor.

The CNSC must bear responsibility for much of these issues.

Communication is one of the most important conditions in BWXT's licence. It is the one condition that the public can easily measure. For the public it is a direct reflection of CNSC's capabilities as a regulator.

The CNSC has consistently failed to establish clear communication protocols from its licensees. This must change if the CNSC wishes to command the public's respect. Communication is a measure of the CNSC's competence as a regulator.

Communication is a licence condition. If the licence means something, the CNSC should enforce this condition. In the case of a driver's licence, a speeder who keeps speeding will lose his or her licence. It should be no different here.

The CNSC does not currently require BWXT to have liability insurance. In addition, the Municipality of Peterborough requires no insurance from BWXT. There's \$5 million for a Santa Clause parade, nothing for BWXT.

Ten years ago I was astonished to learn from the President of GE Hitachi that the amount of liability insurance maintained on the Monaghan property was less than that of my household. The CNSC's policies with respect to liability insurance need modernization. Locating Class 1 nuclear facilities in urban residential areas increases liability exposure. It does not decrease liability.

BWXT needs to have insurance that is aligned with property values.

BWXT's unique position as a leasor of a Class 1 nuclear facility means that property cannot be held in the event of a catastrophe. The CNSC must adjust its policies to acknowledge BWXT's unusual situation as leasor and licensee.

In 12 years of asking I have yet to receive a satisfactory answer from GE Hitachi, BWXT or the CNSC as to why this plant's most dangerous emissions are so close to a public thoroughfare and so close to the junior playground of an elementary school.

Who would engineer something like this? I can only speculate that the engineer didn't know any better.

I respectfully request the following. Beryllium point sources on this property should be relocated to minimize public risk.

The CNSC website states: The CNSC has implemented its IEMP to verify that the public and the environment around licensed nuclear facilities are safe. The key phrase here is "verify that the public is safe".

Recent issues with rising beryllium levels indicate that CNSC staff have not used this data to prove that the site is safe before recommending that BWXT be allowed to extend its operation to include pelleting.

Why did the CNSC claim that the hazards associated with the Peterborough site are well characterized and controlled when the IEMP data indicates the opposite?

Since IEMP data is independent, why is the CNSC not weighting it more heavily in its analyses?

Recently released information indicates that there were serious issues with the handling of beryllium at the GE plant. This was prior to BWXT and GE Hitachi. The Ministry of Labour recommendations were ignored by GE staff and the report of the Advisory Committee on Retrospective Exposure cites GE's callous

disregard for the health of workers and its poor safety culture.

It seems very likely to me that there was an extended period of time in which beryllium was emitted with no or few controls on the Monaghan site.

MECP records indicate that HEPA filters were not installed until sometime around 2002. MECP records also indicate that, prior to the installation of HEPA filters, two AAF brand absolute filter assemblies were approved in 1978. American Air Filters does not currently manufacture filters for beryllium, and I couldn't find any more information about these filters installed in 1978.

The placement of the beryllium point sources on the site maximizes public exposure to beryllium. Evidence indicates that there is no safe level of airborne beryllium.

With the advent of beryllium lymphocyte proliferation testing the CNSC is in a position to determine the degree of beryllium exposure historically to workers, former students of Prince of Wales School and former residents who lived in the vicinity of this plant.

I have a number of recommendations here. They are all available online with my presentation. Due to

time constraints I can't go through them all.

I think the CNSC should reassure the public that their health is safeguarded. We are tired of living with the legacy of this plant.

The image to the right shows damage caused by a hydrogen explosion when a supplier filled a hydrogen tank. It occurred at an Ohio coal burning power plant. I know that this is a high pressure tank. This has been discussed yesterday or the day before in Toronto. But there are lessons to be learned from this explosion.

Risk assessment was done by the hydrogen supplier at the site. CNSC and BWXT also uses risk assessment from the vendor. Fuel tankers carry hydrogen pressure at significantly above 150 psi, which was why BWXT claimed that the tank is safe now. Hydrogen can liquefy nitrogen in the air to leave an oxygen enriched atmosphere for an explosion. Explosive pressures generated under these circumstances are significantly greater than a nitrogen-oxygen mixture.

Refuelling is when accidents most commonly happen. Cryogenic embrittlement can cause failure of tanks.

Most pellet manufacturers around the world

use and argon hydrogen atmosphere when manufacturing pellets. BWXT, CNSC does not. Despite not using a safer reducing environment the CNSC has licensed pelleting facilities in residential areas. There is no international precedent for siting UO₂ pelleting facility of this type so close to a school.

International Atomic Energy Agency's siting guidelines for nuclear facilities state:

"Special attention shall be paid to vulnerable populations and residential institutions for example schools, hospitals, nursing homes and prisons when evaluating the potential impact of radioactive releases."

Does siting a Class 1 nuclear facility in a residential area next to a school abide by the IAEA's siting regulations?

The five posters that you see over here, thanks to my poster girls and boys, are of three pelleting facilities in the US, these produce fuel for reactors in the US and they are light water reactors. The other two are Canadian facilities. Can you tell which facilities follow IAEA siting regulations? I think it's pretty clear.

This is unreasonable risk. 25 meters from a junior playground.

The 2013 GE Hitachi Emergency Management Plan for Toronto states:

"The default evacuation distance for a radiological release is 300 meters."

I'm not supposed to know this information.

Will the CNSC require emergency response training for administrators, teachers, and children at Price of Wales School?

I, therefore, respectfully recommend the following:

The CNSC should abide by international standards.

It should protect the vulnerable.

Siting a pelleting plant in a residential area only 25 meters from a school would be in opposition to international standards. It would be an unreasonable risk. Good neighbours don't make radioactive pellets.

Thank you.

THE PRESIDENT: Thank you very much, Mr. Harris.

Dr. Berube?

MEMBER BERUBE: Thanks for your presentation, and obviously your passionate about this which is why you're here.

Let's ask about this IAEA recommendation. CNSC, could you shed some light on those standards and what they -- are the applicable here? Are they inapplicable? Are they being interpreted correctly? I'm uncertain.

MR. AMALRAJ: Julian Amalraj, for the record.

So the IAEA's documents in terms of safety standards requirements are imbibed in CNSC's regulatory documents and the Class 1 Nuclear Facilities Regulation. They talk to a green field plan new facility going through a lifecycle including siting requirements for assessment and then subsequent construction, subsequent operation, and then decommissioning and then abandonment. And the requirements are by stage.

Right now, at this point, this is in terms of the scope of this licence renewal, it is a renewal application of an existing facility, and the siting considerations for these things were done much prior to this, and this is an operating facility and the

neighbourhood is -- and the facility has been operating for a long time. And the considerations in front here are for the renewal of an operating licence.

DR. DUCROS: Caroline Ducros, for the record. I'd just like to add to that, though. An important point in -- to make, I think, is in terms of it is sited there, it is an existing facility. But when we received the application we treat that application in the context of what is around it and who is there. And this sort of brings me to the point of, we do use differentiated data, so maybe we'll look at one local population, the proximity in terms of the safety analysis, in terms of the emissions, in terms of the environmental risk.

So the safety case, it doesn't matter whether this is an existing facility or a brand new facility, we would be looking at everything that's around and anything that could be impacted. So the activities in relation to the environment is what we look at.

THE PRESIDENT: Dr. Lacroix?

MEMBER LACROIX: Thank you Mr. Harris for your intervention.

You have mentioned that DWXT has not communicated their business plan. Would you care to

comment?

MR. MacQUARRIE: It's John MacQuarrie, for the record.

So by this plan, I assume Mr. Harris is referring to our plans as to whether we would move our facility or not, I think is probably what -- and so I think in the last few days we've communicated fairly clearly about that. Would you like me to repeat any of that at this time?

MEMBER LACROIX: Well, yes, for Mr. Harris, please.

MR. MacQUARRIE: Okay. So we are in a market where we're supplying fuel to Pickering and Darlington stations at this time. There are other nuclear plants in Canada, Bruce Power and New Brunswick Power, and from time to time we have supplied those other plants and we're a commercial enterprise, we try to supply as many customers as we can.

At this point in time we understand that one of the plants that we're supplying, Pickering, will likely reach its end of life and at that point if we're not successful supplying to other customers we could see a significant reduction in the demand for our product.

At that point in time, and we still are assessing this, but there may be a need to consolidate, and we think the Peterborough site would be a good place to consolidate.

There's a fair bit of uncertainty that we face in the marketplace with only two suppliers in Canada and three customers and long-term agreements and whatnot, and so that's -- in terms of a business plan, you know, that's what we have to figure out over the next little while, and to some extent, you know, we'll do our best to try to continue to sustain our business the way it is, and grow it. But we're not in control of that.

Does that answer the question?

I would like to, just maybe on the point of -- since we're talking about community communications and sharing and so you know we have communicated that we do want to do better and we do want to be more transparent and whatnot. It is challenging.

In the case of -- of Mr. Harris, he's visited our facility in Peterborough, sat with our staff, toured the facility, and he's travelled to Toronto, the pellet plant, been in that facility, toured the facility. We've tried to be as transparent as we can be there.

Clearly, it's not enough, we understand that that's not enough. But, now I'm just trying to explain that we're -- we're making an effort here to really open our doors and try and be as clear as we can about everything that's going on in our business. So I just wanted to share our experience there.

Thank you.

MEMBER LACROIX: Thank you.

THE PRESIDENT: Dr. McKinnon?

MEMBER MCKINNON: Yes, thanks for bringing up a lot of interesting points.

I want to focus on your concern about the location of the stack, and it does seem like a very odd decision to place it in that corner, because I actually checked on Google Street here about the school, and there's a date. I think the school has been there over 100 years, if I'm not mistaken.

So I know it's probably not an easy thing to do, to relocate a stack with all of the things attached to it, but is that a possibility? That's the first question.

The second is, I know you've talked about the -- you know the use of the hepa filters and capturing

an extremely high percentage of the emissions, so that leads to my second question about what you do with the beryllium that is captured and ensure the safe disposal of that?

MR. MacQUARRIE: It's John MacQuarrie, for the record.

So on the first question about the placement of the stack, so the stack is located basically directly above the operation, so I presume that's why it was put there.

But in terms of is it possible to -- to relocate it somewhere else on our roof? It is possible. We've been looking at that and so we'll continue to look at that.

So on the second question -- sorry, refresh my memory on the second question, please?

MEMBER McKINNON: It was in connection with the captured beryllium.

MR. MacQUARRIE: Ah, yes.

MEMBER McKINNON: So as part of it is you know emitted --

MR. MacQUARRIE: Yes. Yes.

MEMBER McKINNON: -- and you capture a high

part and it's the safe disposal of what you capture?

MR. MacQUARRIE: Yeah, so in terms of Beryllium waste, so maybe I'll just walk you through all of the -- the waste streams that may have beryllium or beryllium contamination and how we handle that.

They are essentially handled in the same way, but -- so we have -- so when workers are working in that area they're wearing protective clothing and so you can think of it like a Tyvek coverall, and so those are -- are all controlled. They are compacted into drums that we utilize to provide to our waste handling group. So we have a contractor that takes all of our hazardous waste, in this case Beryllium waste.

Similarly, in that room where we do coating of zirconium there's a coater which is where we vaporize the beryllium. Some of the parts in that piece of equipment need to be - beryllium needs to be removed, and we do that in essentially an acid bath and so there's a liquid waste form. The same idea, that gets -- it's in containers and it gets sent, or it gets picked up, actually, by this contractor who handles all of that waste. And we do have a small form of solid, sort of flake form of waste as well, so all of that is contained and in

containers, and taken away by a contractor who is qualified to handle that.

THE PRESIDENT: Dr. Demeter?

MEMBER DEMETER: Thank you for your presentation, it was a really unique suggestion you made and I think it may be an undertaking for either BWXT or staff to ferret out the answer, but I'll preface the question with two statements. One, I understand that the soil concentrations measures to date are below the guideline and way below the human health risk.

And, on the face of it, we've been talking a lot about the trends, so that may impact what we do in the future.

So in similar fashion to what communities have done with contaminated lead and they've done surveys of blood lead levels in inhabitants, including children, when the lead levels were above guidelines.

Is there any utility of the beryllium lymphocyte proliferative test to use for screening in this kind of scenario? I only know of it being used in an occupational medicine kind of setting. I don't know if it's got parameters such as you know false positive which may create more problems than not in the future. But I've

never heard of it being used in that type of setting and that's what the intervenor raises as a possible screening tool for the community. And I know that there may not be answer at this point, but it may be an undertaking. I think it's an interesting point should the need arise in the future and the question get raised. So I'll leave it at that unless there is an answer known at an undertaking or if someone has an answer, I'd be happy to hear it.

MS TADROS: Haidy Tadros, for the record.

So we'll definitely look into that, but I'm just wondering if the Peterborough Public Health Authority is still with us?

No? Okay, thank you.

MR. RINKER: Mike Rinker, for the record.

So I do want to comment, so we'll look into that and come back. But even with what we see as the variation or trending, it's still within the typical values across Ontario. And so I'm not certain that we have any evidence now that we would see anything.

MEMBER DEMETER: So that was two prefaces, one, that the current levels are below guidelines and below the health. It's --

MR. RINKER: And within background?

MEMBER DEMETER: Yeah. So what it provides is, should your next sampling show that the trend is increasing, you've got that in your back pocket as an answer that this is reasonable, or this is not reasonable for whatever reasons, so that the question isn't asked again. So I'm not saying it should be done, I'm just saying it would be an interesting test to look into should the need arise.

MR. RINKER: Mike Rinker, for the record.

So I think that is related to we should be making a plan for the what if scenario should we find something unexpected and beryllium values are higher than what we expect. Then we will take that into consideration.

Thank you.

THE PRESIDENT: Mr. Rinker, can I just follow up on that. When you plan on this additional sampling does the Ontario Ministry of Environment Conservation and Parks work together with you on that?

MR. RINKER: Mike Rinker, for the record.

So we've done that on a case by case basis and I think that would be one of many excellent partnerships in this initiative. I think they're on the phone now, I'm not certain. But they may want --

THE PRESIDENT: Let's check. Ministry of Environment, Conservation and Parks, are you online?

MS SPEAKER: Hi, this is Cathy Chisolm, for the record, we are on the line.

Yes?

THE PRESIDENT: So, the question was, the CNSC is planning on doing some follow-up, sort of monitoring for beryllium in Peterborough. Is that something you are planning on doing, or can you do it together with them? It may be worthwhile doing it jointly.

MS CHISOLM: I am going to pass this on to Jamie Mugford for response.

MR. MUGFORD: Jamie Mugford, for the record.

We see BWXT is committed to doing sampling follow-up and CNSC is doing the independent environmental monitoring program. We'd be happy to review the environmental monitoring program and IEMP plans with CNSC. But based on the emissions that we're seeing and the data that we're seeing, at this point we don't see the need for the Ministry to become involved with that. But if there was a need, we could become involved.

THE PRESIDENT: Thank you. I think my

sense is the more people that kind of look at it and give their support for it, the longer distance it will go in providing assurance, so I see the folks from the CNSC saying that they will reach out to you for support that you may be able to provide them.

MR. CHAMBERS: Is it possible to make a short comment?

THE PRESIDENT: Go ahead.

MR. CHAMBERS: Doug Chambers, for the record.

Whoever does it, I fully support the bigger collaborative effort. I think it will be very good.

And something that Mr. Rinker commented this morning is critically important from past experience, that in looking at the study design and the protocol, it's very important to make sure each of the participants fully understands the actual process of what you do with the sample once you collect it from the ground.

You know, mortar and pestle, sieve size, and very importantly the digestion procedure, because from past experience I've seen labs that purportedly use the same protocols but they bake the soil in acid for an extra half-hour or something and you get very different numbers.

So, I think in any comparative study we have to really look carefully at the full protocol from the sample collection right through to the mortar assay.

Thank you very much.

THE PRESIDENT: Thank you.

Mr. Harris, were you around when the Peterborough Medical Officer of Health was presenting earlier today?

MR. HARRIS: I was.

THE PRESIDENT: And given her conclusion about the lack of health impact of the operations, the current operations of BWXT in Peterborough and her -- quite confident that even if pelleting were to be brought her, she didn't think it would necessarily cause harm. Were you reassured by that?

MR. HARRIS: Frankly, no, I wasn't.

A lot of this hearing has been spent around CNSC, to be honest, and CNSC staff activities and beryllium in particular. I find that what happened with the beryllium samples was absolutely appalling.

Mr. Aherne -- or Dr. Aherne, I think -- would be quite a bit more political than I am, but as a parent whose kids attended that school during this

timeframe, I'm really appalled by what I've seen from CNSC staff.

Two months ago you had a state-of-the-art laboratory analysing beryllium, ensuring that the public was safe.

A couple of days ago and during your presentation in Toronto I see that there's a 40 percent margin of error for the 2014 results. And I see a whitewashing happening, to be perfectly honest.

Dr. Aherne was concerned about the increases in soil beryllium levels, not the absolute quantities. So, asking about uranium you know the CNSC is the regulator here, and these kinds of things, the lack of proper communication protocol, I'm really concerned about this.

I had 29 parents sign a letter asking questions for the Minister of Natural Resources and he deferred me to you. And it's not your job. I wonder if there's a cultural issue here, to be perfectly honest. I just see a whitewashing happening and I'm very concerned about that, and that doesn't reassure me around uranium; it doesn't reassure me around anything that's happening at this plant.

THE PRESIDENT: So, let me try a slightly different angle with you, Mr. Harris, because I look at this slide in the CNSC's presentation on beryllium concentration in soil. There, according to this cart, their lab analytical uncertainty has improved over the years. It started as at plus or minus 40 percent, but the latest one is plus or minus 10 percent. So, to me, that sounds like it's getting even more state-of-the-art, doesn't it?

MR. HARRIS: No.

THE PRESIDENT: Okay. Tell me.

MR. HARRIS: It calls into question the increase, doesn't it? This 40 percent error was not reported last year; it was reported three days ago. I find that reprehensible.

So that margin of error is suddenly there so it calls into question -- plus or minus 40 percent calls into question that value. So now you see an increase against the value that is of questionable value.

You're trying to reassure the public; you're not doing that. You add -- you add a control in 2019 that wasn't there in either of the other two samples. What? I mean, that's crazy! You sample. You're there, you're sampling, why would you take such a limited number

of samples? I mean, I'm a science teacher, my Grade 9 students would know that you need a control.

THE PRESIDENT: CNSC staff, anything you want to add in response to that?

I think the bit about lab analytical uncertainty, I mean there should be a standard process in how you report your results, is it not?

MS SAUVÉ: Kiza Sauvé, for the record.

When we noticed there wasn't a background sample being taken, we added it in 2019 and we are continually trying to improve the program. We're really trying to balance how we're reporting results from a public-friendly and a technical; we're trying to balance those two things. And so we're hearing about the analytical uncertainty and we're actually looking at revamping how we're reporting right now.

We've got some drafts of a new webpage going and we're even talking right now with our communications team about how we can better report, and in doing better reporting, engaging the public at the same time to make sure that how we're reporting meets what they're looking for so we can get feedback continuously on the program and on the reporting. And, like I said, we'll

really try to improve.

THE PRESIDENT: Perhaps Mr. Harris, you and maybe Mr. Aherne, you know, who to me sounds very knowledgeable and exactly know what would at least make you feel a bit more comfortable that what's being done is robust and solid and independent, that maybe you need to work with the CNSC staff as they embark on their follow-up monitoring.

MR. HARRIS: Yeah, my expertise is not beryllium. I mean, I've followed it for a long time and I've been very concerned about it for a long time.

Dr. Aherne is the specialist in the room, with all due respect to the CNSC; he's the guy.

You didn't give him enough time last night, to be perfectly honest. I know --

THE PRESIDENT: Yes, I -- I'm sorry about that. We were strapped. But we do have question that had raised, so we'll try to get him if he is here.

MR. HARRIS: He is volunteering to come back in and you know he'll offer his expertise tonight and tomorrow, if you are willing.

I don't know, I mean if you're -- if you weren't ready to have IEMP results released, why would you

release them? That would be my point to CNSC staff.

I also am very troubled by the timing of the release of this. We had to ask our environmental -- our legal representatives to ask CNSC staff to release that data. And ultimately it was released one month after CMD 20-H2 was released -- one month afterwards.

How can you say that the public is safe when you've not got the data in front of you? So, I'm deeply troubled by this, and I hope members are also bothered by it.

THE PRESIDENT: So we did ask staff about the timing of the release of the results and I'll try to recall what I -- I thought we heard, was the licence renewal application was actually going to be based on the previous set of results, the 2018 results. But, that they got the 2019 results. They normally would have taken a bit more time to review and make sure they understood what it meant, but given that the numbers were up, I think that they erred on the greater transparency side and let's get it -- well, maybe not. Why don't I get you to explain the 2019 results and the timing of the release of those results?

MS SAUVÉ: Kiza Sauvé, for the record.

You almost had the timing. When the open houses or the Meet the Nuclear Regulator sessions were scheduled, we said let's make sure those results are available so they could be discussed on screens or through, you know, your phone, because you can access them online. So that's why we rushed them for January, to get them ready for those.

But I do want to point out, I am going to say it again, that when I have been reviewing the results, when I do review the results, again, I have children that are in school and I look at how would I -- what would I do if I saw these results and how would I review these, knowing that my children were at that school. And again, they are below any guidelines. We do see the trend and we are following up, but there is no risk to those children at the school.

THE PRESIDENT: Yes, but I think the more critical point in my mind here is the CNSC was not sitting on those results.

MR. HARRIS: There was no statistical analysis of the results to show the trend and that is very concerning, you know. And that is the focus of the letter I sent to the Minister of Natural Resources, is that they

didn't do the -- why would you ask us or tell us that more sampling is needed when you aren't going to do the analysis? You know, you're asking for more lab results, but you don't do the statistical analysis. I'm sorry, that is not acceptable.

DR. DUCROS: Caroline Ducros, for the record.

Can I just complement my colleague's answer?

In terms of the environmental assessment, in terms of determining whether the emissions are protective -- they are low enough to be protective of human health or not, the data that is very critical to the CNSC is the continuous monitoring data at the stack and we receive that data in the annual compliance monitoring report and that is what we inspect against.

So the IEMP needs to be put in the context of it's the publicly accessible areas that's a spot check against the more robust and scientific Environmental Monitoring Program that went into our assessment of risk.

MS SAUVÉ: Kiza Sauvé, for the record.

The other thing I would add is we did speak with Dr. Aherne after the session ended early -- or

not early, late last night and we did say when we do come back we would be reaching out to him to look to have him involved in designing the program.

THE PRESIDENT: And if Dr. Aherne is available today, we will try to bring him back here and speak to him.

Any final words from you, Mr. Harris?

MR. HARRIS: Yes. I guess again I would like to point out that it was a non-CNCS employee who raised the alarm. We would never have known had Dr. Aherne not have happened to have analyzed the results in the 10-year renewal cycle, the 10-year licence. So, you know, these are chances and you want to reassure us about safety. It's kind of hard to do that I think when it's the public that is raising the concern and not CNCS staff.

To be honest, I had hoped in this presentation to focus a lot more on BWXT's application and I found that I wasted a lot of time talking about CNCS staff activities. I don't think that is appropriate, to be honest.

I would have pointed out to Members, and I should say in closing that I have met with BWXT staff and I am impressed by their civility and professionalism. I am

also impressed by all of you, you have raised the bar. I have been through previous hearings and you have definitely improved the civility of these hearings.

But as Commission Members -- and I was asking about a business plan earlier. BWXT has a business relationship with a company called NuScale and that is one of the new small reactors. It is a Wild West out there in terms of small modular reactors and you are going to be approving the facility, if you do, that is probably going to be dealing with enriched uranium. And some of these fuel types are really exotic. I can read them off here, but you probably don't want me to. But you are looking at an approval that I don't know how you can do it. It's a complicated issue and I hope you appreciate that this is a generational decision.

THE PRESIDENT: Thank you. I'm sure we will have lots more discussions on that subject down the road. Thank you for your intervention.

The next presentation is by Mr. Philip Kienholz, as outlined in CMD 20-H2.133, 133A and 133B.

Mr. Kienholz, over to you.

CMD 20-H2.133/20-H2.133A/20-H2.133B

Oral presentation by Philip Kienholz

MR. KIENHOLZ: Philip Kienholz,
for the record.

Hello. It's really nice to be here. I appreciate you accepting my written submissions and for the opportunity to speak.

I want to start off by saying that I do oppose pelleting and I oppose nuclear industry on that particular GE site with the residential character of it and so close to the school.

Seven questions from my intervention number 133 were not answered. I do not expect immediate answers and I will not review the questions here, but I would appreciate eventually receiving replies.

I want to suggest -- oh, I want to say something about the mandate.

It has been stated that this is our mandate and this is outside of our mandate. I want to mention -- I want to suggest that it is the mandate itself which is the problem and I want to take a few moments to suggest a few positive nuclear safety activities that a

Nuclear Safety Commission could undertake that would benefit public interest.

One, advocate with the governing Minister for separate nuclear licensing and regulating bodies.

Two, advocate for nuclear weapons treaties and nuclear disarmament agreements. This would be a very major step for reducing the most significant nuclear risk of the present day, that is to remove the hair-trigger nuclear weapons threat capacity that perpetuates a psychologically debilitating balance of terror.

Three, begin a process of adopting appropriate, meaningful precautionary principles.

Four, determine uranium amounts needed for medical and scientific instrumentation purposes and advocate for limiting mining accordingly.

Five, advocate and co-sponsor with the private sector programs that effectively address legacy uranium mine tailings.

Six, recognize the health science of internal alpha emitters. There is a lot to that that hasn't been brought forward.

Seven, sponsor research in renewable energy production, development and use so as to replace

nuclear power stations. But I would say that it isn't so much reliance on renewable energy production which is required as a reduction in our throughput of energy in our civilization. There are many people who have said that as well.

And the last one seems obvious, emphasize safety in considering the regulatory courses of action.

I will briefly address the staff supplemental document CMD 20-H2.B.

I am taken aback by the remark on page 2:

"After carefully considering every intervention, CNSC staff conclusions and recommendations found in CMD 20-H2(2) remain the same."

A remark such as this from and approved by the CNSC staff is most discouraging and that, if true, it would mean that CNSC staff discussion is over, they need not adapt any of their statements, any of their thinking or their conclusions based on public input, that there is no need for further thought or deliberation. Case closed.

And I want to compliment the President for her opening statements, opening remarks where she contradicted this and said, no, discussion is still open.

Thank you.

The staff's response on item 4, page 10, contains a misleading statement and that was the only place my intervention 133 was mentioned. The statement is:

"The dose from inhaling a single particle is about 1 billion times less than the regulatory dose limit of 1 mSv per year. It is effectively zero dose."

Well, it would be effectively a zero dose if applied externally to the entire body, but when an alpha-emitting uranium dioxide particle becomes lodged within the body adjacent to living cells, the radiation dose per year for those cells would vary from approximately -- and I am using numbers here that I derived from Dr. Edwards and I see he has changed his numbers a bit, but we are still talking in the same ballpark. The radiation dose per year for those internal cells would vary from approximately 7 to 248 mSv per year depending on the particle size and distance from the cell, but since alpha radiation is considered to be 20 times as biologically effective as beta or gamma radiation, these numbers would correspond to a dose of approximately 140 to 4960 mSv per

year.

Now, I heard one of your experts in Ottawa say that the dosage is based on organ -- to an organ, which makes no sense since cancer starts with just one cell. One cell becomes mutated and then creates a line of further cells. So the organ is suffering from cancer, it's the cells that suffer initially from the cancer. To me that's all -- well, I won't criticize it any farther.

Any insoluble single particle can remain in the body for decades, continually irradiating adjacent cells. Cancer begins with a single mutated cell that reproduces its mutation.

Please see on page 8 of my submittal an extract that is very conservatively reviewing the extremely complex process of alpha emitters within the body. The extract is taken from the European Committee on Radiation Risk's 2010 publication, "The Health Effects of Exposure to Low Doses of Ionizing Radiation".

The science of the health effects of alpha emitters within the body is given on my pages 5 through 8, supported by my footnotes 9 through 16. That's it.

Additional support of negative health effects of alpha-emitting uranium dioxide within the body

is given in a document not referenced in my written submittal, it is the International Agency for Research on Cancer, World Health Organization Monograph 100D-9 entitled, "Radiation and Review of Human Carcinogens". On page 275 they make the very simple statement, and I will emphasize it the way they have:

"Internalized radionuclides that emit alpha particles are carcinogenic to humans."

Additionally, for children, I have heard people say, "Well, all of the studies have been on male adult workers. We don't know about children, we haven't studied them enough."

Well, in 2009, the World Health Organization, in a training package for the health sector, "Children and Radiation, Children's Health and the Environment", on Slide number 5, and I will quote:

"Ionizing radiation is a known carcinogen to which children are particularly vulnerable. Although the mechanism of greater susceptibility is not well understood..."

So they're saying there it is, we just don't understand it.

"Although [it] is not well understood, it is likely to be linked to greater cell division in growing and developing tissues. In addition, a longer expected lifetime, with a resultant increased chance of repeated exposure and accumulated damage, also leads to higher cancer risk in children."

Now, I want to address the issue of the mandate. I want to quote first the preamble of the *Nuclear Safety Act*, just the first phrase:

"WHEREAS it is essential in the national and international interests to regulate the development, production and use of nuclear energy..."

Now I am going to quote just the first portion of the first statement of the CNSC Regulatory Fundamentals.

"The Government of Canada has

determined that the use of nuclear substances and nuclear energy offers benefits."

Both these documents quickly proceed to recognize the importance of safety, but nevertheless safety remains secondary to development, production and use.

So we can see why the licensing process for nuclear energy and nuclear fuel production facilities invariably results in licence approval, and we can see why the 2017 Environmental Assessment Expert Review Panel heard repeated complaints of the nuclear regulator promoting projects they were also regulating and that the regulatory efforts were captured -- I'm sure you heard this before -- by the interests of the industries they were regulating.

That is the actual legislative role of the CNSC, to regulate in a way that does not interfere with the benefits of nuclear substances and energy and their production, development and use.

A lot of people have said safety is the issue. My analysis shows that it doesn't seem to be. It is a clear conflict of interest and does not allow protecting the safety, health and well-being of humanity.

My supplementary submittal 133B addressed

the precautionary principle. I spent a lot of time going through all the sources I could find within the time limit on that, but discussions about -- this is some of the things that I reviewed -- burdens of proof, the status quo, imbalances of power and information, indeterminacy of science, value-laden science, the role of science amid other systems of knowing.

The precautionary principle, its implementation and democratic promise, all of these concerns, all of these considerations are moot, they are meaningless so long as the adjudicator of the allocation of the burden of proof is the regulator itself which has a legislative mandate to advance the very processes that are the source of nuclear pollution.

Thank you again for allowing me to speak.

THE PRESIDENT: Thank you very much,
Mr. Kienholz.

We will start with Dr. Lacroix.

MEMBER LACROIX: Thank you, Mr. Kienholz,
for your presentation.

Your third recommendation is about updating the Preliminary Decommissioning Plan and making it available to the public. Isn't that plan already available

to the public?

MR. KIENHOLZ: The third recommendation was to begin a process of adopting appropriate, meaningful precautionary principles. I would suggest if you look at my paper you will see there is a lot to it that hasn't yet been addressed. It opens up democracy in a new way.

MEMBER LACROIX: I stick to my question --

MR. KIENHOLZ: Yes...?

MEMBER LACROIX: -- and from your submission, among all the recommendations that you make you make a recommendation that an updated Preliminary Decommissioning Plan should be made available to the public.

MR. KIENHOLZ: Oh, yes.

MEMBER LACROIX: This is my question --

MR. KIENHOLZ: I didn't understand.

MEMBER LACROIX: -- and this question, I am asking it to CNSC staff.

Isn't that plan already available and if it is not, why?

MS TADROS: Haidy Tadros, for the record. I think BWXT is better placed to answer that question.

MEMBER LACROIX: Thank you.

MR. MacQUARRIE: It's John MacQuarrie, for the record.

There is a summary of the plan on our website. It was recently updated as part of the renewal process and there is a summary on the website.

MEMBER LACROIX: That's great, thank you. Does that answer your question, Mr. Kienholz?

MR. KIENHOLZ: Well, if you look further there, I make a recommendation about what to do with the site, which would be to condemn it immediately and then begin the process of an environmental hazardous abatement. So yes, that answers my question.

MEMBER LACROIX: Thank you.

THE PRESIDENT: Dr. McKinnon...?

MEMBER MCKINNON: Thank you.

I would like to go back to a question which has been partially addressed before, but it has come up again a number of times and I think to non-specialists it's a confusing issue.

So my question is for CNSC staff. It's in connection with this issue of if you have one uranium

particle that is absorbed into the body and it's adjacent to some cells in the immediate vicinity, why is it the exposure to the entire organ rather than just the local effect taken?

MS TADROS: Haidy Tadros, for the record.

So I would ask our internal dosimetry specialist to maybe walk us through how we look at the effects of radiation and how we go about getting to the sievert to define what the dose is.

MR. THÉRIAULT: Bertrand Thériault, for the record.

So the method that licensees use to calculate dose from intakes of radionuclides is based on the recommendations of the ICRP, the International Commission on Radiological Protection, which is a group of international experts which is designed for radiation protection purposes. So it's not for research purposes or other applications such as radiation therapy.

So the dose, as I had said earlier today, so the system of the ICRP for calculating internal dose is to assess the risk from all alpha, beta particles, gammas released in every organ and tissue of the body and to assess the whole risk in that sense. So it's an ICRP

approach for radiation protection purposes.

Just for context, it's not a CNSC-specific method that we came up with. It's internationally recommended, which is what we require licensees to follow.

So comparing the dose to very small parts of the body, a single cell, to the effective dose limit of 1 mSv in the *Radiation Protection Regulations* would be like comparing apples and oranges. They can't really be compared to the dose limit because they are not really the same quantity.

THE PRESIDENT: Dr. Demeter...?

MEMBER DEMETER: Thank you very much.

Is it possible to bring up page 6 of H2.133, the table? I think this is important.

So what I want to talk about if we can get that page up is --

--- Off-record discussion / Discussion officieuse

MR. KIENHOLZ: I do have it in front of me.

MEMBER DEMETER: Okay, it's on the intervenor's CMD H2.133, but I will speak to it.

And unfortunately, Dr. Edwards isn't here, but Dr. Edwards gave us dosimetry based on very small

volumes of tissues based on one alpha particle. When we talk -- and, you know, to me when I first saw them they looked alarming given the doses, I have to say, right. So I had to reconcile these doses based on what staff have been talking about.

And when we talk about risk we have to talk about apples to apples and the way to talk about risk is the total amount of energy per kilogram of tissue exposed, whether it's internal exposed or external exposed.

If I take 1000 -- if I take one sievert over -- or 1 mSv over a whole kilogram and then I say I'm going to put that all into 1 gram, it will look like 1000 mSv. But the risk calculations from ICRP are based on the total energy in a kilogram of tissue and from that we derive the lifetime risk of cancer based on that exposure, not on this microdosimetry.

So I appreciate the -- and I had to reconcile this for myself as well -- the optics of these very high doses, but if you do them in a gram of tissue when they are supposed to -- the risk is calculated over a kilogram of tissue, so divide these numbers by 1000 and then apply the risk coefficients from ICRP and that's where you're at.

So I recognize the discrepancy between microdose and risk-related dose estimates and I want to bring that up. If our internal dosimeter specialist in Ottawa agrees or disagrees with me, he can let me know, but I had to deal with the discrepancy myself.

MS TADROS: Haidy Tadros, for the record.

So, Bert Thériault, do you have anything further that you would like to add or confirmation?

MR. THÉRIAULT: Bertrand Thériault, for the record.

So no, that's good, I have nothing else to add. Thank you.

MEMBER DEMETER: And I agree.

MR. KIENHOLZ: May I say something?

THE PRESIDENT: Why don't we leave yours for the end when you get to say the last word.

Dr. Berube...?

A question for staff. One of the recommendations made by the intervenor, this interesting concept of fully separating the licensing and regulating functions, are there any other nuclear regulators around the world that actually have that?

MS TADROS: Haidy Tadros, for the record.

I believe Mr. Ramzi Jammal might be able to answer that question.

MR. JAMMAL: It's Ramzi Jammal, for the record. I just need a bit more clarity, separating licensing from compliance oversight?

THE PRESIDENT: Yes. He called it regulating function, but I think that's what it is, the licensing and then the ensuring compliance, yes.

MR. JAMMAL: It's Ramzi Jammal, for the record.

Many regulatory bodies function as established by the IAEA and the recommendation according to the generic safety requirement, safety fundamentals and safety standards that the regulatory body will be a full cycle. So in other words they will be the licensing process and the regulatory oversight, which we call a compliance activity.

In certain countries the issuance of the licence is a different process. However, the structure we have here in Canada with respect to the oversight, continuation of the oversight, is similar around the world. So if you take the mature countries around the world, France, U.S., which is USNRC, and us, Canada, they have a

regulatory body which is called a Commission and they conduct the activity accordingly.

In addition to us as a Commission, as the intervenors and the public are seeing, there are a lot of other agencies who are involved in supporting the CNSC. And the mature regulatory bodies, even upcoming ones, actually are taking on a model similar to the CNSC where they are doing the licensing and compliance activity.

THE PRESIDENT: Thank you.

Mr. Kienholz, over to you.

MR. KIENHOLZ: First, I will address the most recent comment by referring to Canada's membership in the International Atomic Energy Agency. It requires Canada to take the appropriate steps to ensure an effective separation between the functions of the regulatory body and those of any other body or organization concerned with the promotion or utilization of nuclear energy. But here we have that function combined in one organization and then --

THE PRESIDENT: I'm sorry, where did you think the promotion of nuclear energy was in the CNSC's mandate?

MR. KIENHOLZ: Okay. I will go back to my oral statement. It has to do with the regulatory

fundamentals beginning with:

"The Government of Canada has determined that the use of nuclear substances and nuclear energy offers benefits."

And the *Nuclear Safety Act* says:

"WHEREAS it is essential in the national and international interests to regulate the development, production and use of nuclear energy..."

Taken together, those two seem to me to put you in a conundrum in terms of regulating safety.

THE PRESIDENT: Okay. I guess that's your opinion. I see us having absolutely no role in promoting nuclear, but you are entitled to your perspective.

MR. JAMMAL: Madam Velshi, if I may? It's Ramzi Jammal, for the record.

Here I would strongly recommend for our intervenor to take a look at our website. We just underwent a peer review process internationally and unequivocally state it with respect to the independence of the regulator and maturity of the regulator. We would be

more than happy to give him that link. The interpretation that has just been given, I am guessing right now it seems like an individual interpretation. But we underwent a peer review, unequivocally stated in the executive summary the independence and the capability of the CNSC.

MR. KIENHOLZ: Yes. I would refer back to the article written by the CLSC published in that Swiss journal that is referenced in my submission, because they also recommend the separation of the two in that they aren't essentially in harmony with each other, the two functions.

I want to say a little bit more about the --

THE PRESIDENT: Mr. Kienholz, now is just your closing comments for 30 seconds, please.

MR. KIENHOLZ: Okay. Within the *Nuclear Safety and Control Act*, in the section Canadian Nuclear Safety Commission Objects, 9(a)(iii), it is to:

"(iii) achieve conformity with measures of control and international obligations to which Canada has agreed..."

And Canada has agreed that they would take

the appropriate steps to ensure an effective separation between the functions of the regulatory body and those of any other body or organization concerned with the promotion or utilization of nuclear energy.

THE PRESIDENT: I agree with that, yes.

MR. KIENHOLZ: So yes, that's all I have to say. I guess you don't agree.

THE PRESIDENT: No, I do agree with that.

MR. KIENHOLZ: Okay.

THE PRESIDENT: I absolutely that those need to be separated. I thought your recommendation was to separate the licensing and regulating function. What that is saying is separate the regulating function from the promotion function.

Okay. Thank you for your intervention.

Our next presentation is from the Port Hope Community Health Concerns Committee, as outlined in CMD 20-H2.134 and 134A.

I will turn the floor to Ms Faye More for this presentation.

Over to you, Ms More.

CMD 20-H2.134/20-H2.134A

Oral presentation by

Port Hope Community Health Concerns Committee

MS MORE: Thank you very much.

Members of the Commission, I am representing the Committee. We are a citizen group that formed in 1994 concerned about health effects from the operation of two nuclear industries in the midst of our town, one a very short walk from a school.

One of the problems I have observed yesterday and today, which is historically a problem, is your sense that -- and you say that it is safe and how do you convince us. And I think for the excellent intervenors that you have heard, the answer would be we know you are wrong. So I would ask you to please consider what I say and what the others have said from a framework that you may be wrong and it may not be safe.

So I have to say I'm starting at the back of my slide deck because, given the discussion, I think it's really important that you hear some of the health information that might not get due time if I don't do that.

So starting out with our recommendations,

essentially we are recommending no more than a five-year licence, less if that's feasible; to begin changes at the operations for this company to decommission and relocate.

This is the same recommendation we have given for the two companies in Port Hope operated by Cameco Corporation.

The next slide is a very important one from the standpoint of tackling this health question and the safety question. I have heard it said that uranium is not carcinogenic, that the operation is safe, that basically it's okay to inhale uranium particles.

Well, let's look at the U.S. Department of Justice, based on U.S. Department of Labour, Department of Energy. They have two Acts in the United States. They have paid out as of 2019 \$17 billion to employees. They continue to pay out every year. This is not a historical program only, it is partially historical.

The *Energy Employees Occupational Illness Compensation Program Act* recognizes harm to nuclear energy workers and it pays compensation. Also, it includes miners, it includes those who have worked in refineries, it includes community down-winders.

A really important consideration is that

35 diseases are associated with ionizing radiation exposure and it is recognized in law and the reason they did this was to, on the preponderance of evidence, grant to a worker so that he does not have to go through -- or she -- what Dan Rudka is still going through, that on the preponderance of evidence Dan Rudka would have been granted compensation years ago. We need this in Canada.

Documenting doses from UO2 transportation. This is from the Zircatec which is now owned by Cameco. This is from their environmental review in 2007, which is a really critical point about having environmental assessments. You get far more disclosure through a proper EA process than you ever get from a licensing process, which is extremely superficial.

So there is documentation that transports of natural UO2 add to the annual gamma radiation dose, not only to the driver but to others on the road.

Near Port Hope there is a truck with cylinders parked beside Tim Hortons. It's emitting -- it could be neutron radiation, they do do that, but certainly there would be gamma radiation coming off there that anyone walking by and driving by is exposed to.

This is from Cameco's documents just

showing the wind patterns out over the whole community.

This is from MOE, from their draft *Uranium in Air Standard*, 2010, which we understood was even being developed because of Port Hope and the proximity of the facilities, that the inhalation pathway gives doses 200 times greater than ingestion.

This is very important, because I have heard it said that there is no evidence that the radiation exposure in Port Hope caused any harm and that is false. There is evidence. It's not taken as evidence, it's ignored, it has been glossed over. It was not further developed, there were not further studies done as a result of this, and the CNSC compendium was ridiculous in its dismissal of very important statistically significant data from different time periods and you will see that this is federal data.

These studies were done because of the pressure from our Committee over a number of years and a number of conversations around roundtables, and you will see that there was significantly higher rates in Ontario and this is from the Health Canada Great Lakes Health Effects Program data in 1998, because the Port Hope Harbour is a designated area of concern by the International Joint

Commission.

This is just -- please bear in mind that every slide has years of detailed experience of community people behind it. I am only giving you a flavour to try to counteract the false information being given.

There are just a few clippings here that show -- this is one of my personal heroes -- Dr. Douglas Andrews, who was the first nuclear engineer at the University of Toronto, came to Port Hope in 1976 and helped the people understand that we had a problem of contamination in the soil. The extent of it has continued to unravel over the years. He warned the government in 1966. We have 1.7 million cubic metres of radioactive waste currently being cleaned up by the federal government, which has set aside \$1.2 billion, and we are only now -- this is 45 years later -- we are only now really undertaking a cleanup in our community. Peterborough is very wise to ask the questions about who is responsible, what will happen to us if our property is damaged.

Politicians backed a public inquiry as to how this ever happened, and again it was the federal regulator at the time. It never happened. Scientists were warning it was the tip of the iceberg in 1976 and they were

right. Laws were being broken. Yes, they were, because we were being expected to have the lungs of uranium miners, according to Dr. Andrews, on the Main Street of our town.

I was at this meeting in 1976 when residents confronted the Ministry and we were trying to understand what had happened in our town. Our beach was taken away to Chalk River. That was the beginning of discovering that the places we had gone to, the experiences that we had were all part and parcel of a community that was terribly contaminated. And again, we are still waiting for a cleanup.

So going back to concerns with CNSC, this ongoing licensing of Eldorado Nuclear and the lack of meaningful oversight resulted in this problem. And licence after licence by the Commission, which is still occurring, these plants are still licensed in Port Hope, they still emit radioactive material and heavy metals, chemicals. Licence after licence ignores the fact that these operations have no business in the middle of a town and hence our recommendations to you for BWXT.

The problem is why don't people have any power? Power is very hard to come by with this industry -- with this regulator, sorry. Low financial guarantees are

accepted, concerns about liability insurance. Where is the protection for public and private property? Again, concerns with CNSC actions.

Yes, there was a transfer of licence by Chairman Binder. He heard the hearing himself. The formalities had not even been worked out yet, but that was approved. Ten-year licences severely limit public participation.

And the conclusion we reached a long time ago was that you as the regulator, you are biased on behalf of the industry, not the public, and the actions of Port Hope and the neglect of our community is evidence of that fact.

There has been talk and you have heard excellent interventions about the need for monitoring. There is no question there would be fugitive emissions from this old building. There is transportation of hazardous materials through this town. The precautionary principle is not applied now or historically.

The exposure to inhaling insoluble ceramic uranium is not the same as a flight or uranium in the soil. Alpha radiation from uranium is a known human carcinogen. Alpha, beta, gamma, neutron radiation are all emitted by

uranium.

Alpha particles -- and you heard this from Dr. Edwards -- inhaled irradiate cells, they go to bone, they damage organs, and the insoluble material is what we are talking about that is coming out of the stacks or is being dumped through waste or into the water. It is not the natural uranium that is found in the rocks. So this is ceramicized. It's the difference between having a marble in your lung and a sugar cube, and a sugar cube that keeps irradiating the cells around it. And it calls into question the concept of dose that gets tossed around. These are all guesses and you can see that and you can feel it in the way the conversation goes.

What you saw in the Port Hope data was health outcomes of real people and we wanted more follow-up. We haven't had it yet. We did do urine testing and Dan was one of the subjects and it found uranium-236, signature isotope of spent reactor fuel. What on earth was that doing in Port Hope? Well, it turns out both companies admitted they have had HEU in Port Hope at 93 percent and they admitted that at a CNSC hearing when they wanted to bring SEU to Port Hope. What was 93 percent enriched uranium doing in our town? Never disclosed.

A huge problem with your regulation is that you allow changes mid-licence. So somebody can walk out of here thinking, okay, a situation is this and this is what it's going to be, but what we were told was the 93 percent enriched increase would have been issued by a letter. There would have been a letter of permission. We have asked to see that. It has never -- nobody could find it.

Particle size, composition, isotopic ratio -- and by the way, the finding of U-236 really called into question what's in the waste in Port Hope. Some of those wastes cannot go into the temporary storage facility, they have to leave town because they are of a whole other ilk.

Cautionary tales. So I have worked backwards, so you are getting the picture, no buffer zone.

THE PRESIDENT: Get to the recommendations then, please.

MS MORE: Yes, so back to the beginning, that no more than five-year individual licences be granted and that this plant be required to decommission and to leave the community and relocate somewhere else.

And it's important to note that the Blind

River Refinery is located on 640 acres away -- it's five miles away from the Town of Blind River. So why do Port Hope and Peterborough have to deal with these messes in our midst and the risks that you impose on people? Just imagine the risks that people of Port Hope have had since the 1930s.

And can I just close by mentioning that the federal government knew in the 1930s that uranium was toxic, they knew that it caused cancer. They worried about the community, the Déline community in the Northwest Territories because they were carrying yellowcake in sacks. And some people have obtained correspondence under access to information that shows that the federal departments were aware at the time.

So nobody needs to tell us that uranium is safe and that nobody knows the truth, because we know that you do. Thank you.

THE PRESIDENT: Thank you for your submission.

Dr. McKinnon...?

MEMBER MCKINNON: Yes, thank you for bringing your experience here.

One of the concerns you mentioned in your

presentation is the low financial guarantees. We have discussed the nature of the guarantees and their reliability, but the other aspect is the actual value.

So I would just like to ask the company about how it developed those numbers, the specific numbers of \$10.7 million and \$37.3, the various ways of estimating how much something would cost, anything from using just empirical evidence of, you know, what experience has been elsewhere or it could be done considering very detailed activity-based unit costs and so on, which probably is more reliable.

Could you explain a little bit about the process you used so we can understand the reliability behind the numbers?

MR. MacQUARRIE: It's John MacQuarrie, for the record.

So to develop the estimate for the Preliminary Decommissioning Plan, we contracted that to a company that specializes in nuclear waste management and decommissioning. So they developed the plan and the estimate for us and they did -- to my understanding, they did do sort of a detailed activity-based kind of bottoms-up estimate looking at the various things that would have to

be done in each part of each facility, and you know, because operations are different between Toronto and Peterborough, they have different activities that were required and hence the different amounts of costs that are associated with each facility.

MEMBER MCKINNON: Okay. Thank you. That is very reassuring.

And CNSC has checked those numbers with its own methods and values?

MS TADROS: Haidy Tadros, for the record.

Yes, we have and I will ask Ms Karine Glenn to speak to the detailed analysis we do of the plans and the cost estimates that are provided.

MS GLENN: Karine Glenn, for the record. I am the Director of Waste and Decommissioning.

Absolutely, we do verify the data. We have a regulatory document that outlines what the expectations are in terms of cost estimating. We are actually in the process of revising that document.

So we look first of all at the decommissioning plan and the activities that are outlined to make sure that everything has been covered. We then look at the actual cost estimation and it's done using a

work breakdown structure and the international structure for decommissioning costing, which is an internationally recognized way of doing the estimates.

We look at the basis of the estimates, we look at the escalation that is used, at labour rates, the amount of contingency based on the uncertainty associated with different activities. So all that is looked at by both the folks in the Waste and Decommissioning Division.

We also get our financial advisors to review it for basic financial assumptions such as the value of escalation, any discount rates that are used and whether or not they've captured every -- all the information necessary and whether the estimate, the level of estimate and contingency is suitable for the level of detail in the plan.

And so we do review all of that.

MEMBER MCKINNON: Thank you very much.

THE PRESIDENT: Dr. Demeter.

MEMBER DEMETER: Thank you very much for your intervention.

Maybe CNSC Staff can shed some light on this to compare and contrast.

So Canada's gone through a number of

legacy sites with various degrees of intensity of remediation, Port Hope-Port Granby being the one example that you've raised.

How and why is this site different than those legacy sites?

Intervenors have brought up that we don't want to go through all this again. They've -- you know, it seemed that the regulator wasn't necessarily totally on board for those other sites. Things happen, and now we're dealing with this clean-up.

So maybe you can shed some light as to how and why, on a go-forward basis with the current licensee, it's different.

MS TADROS: Haidy Tadros, for the record.

So I guess it comes down to how we look at legacy sites, what do we define as legacy sites. And this is a topic that is discussed extensively internationally because many countries are dealing with the regulatory oversight and the financial aspects that come into play, who owns what, who pays for what.

From a regulatory perspective, our regulatory framework is very clear in terms of what constitutes the need for a licence and what constitutes the

absence for a need for a licence. So we have within our Nuclear Substance and Radiation Device Regulations clear schedules of what clearance levels look like, what unconditional -- this is from a radiological perspective.

When we look at Port Hope, for example, Port Hope is currently being cleaned up. It is low-level radioactive waste that was there, and it's being cleaned up due to the fact that these levels are currently being consolidated into a state-of-the-art wastewater treatment centre.

The legacy that we speak of here with regards to GE and BWXT as again we've discussed, BWXT as the licensee is responsible for their current activities, has an agreement with GE for any waste or any substances that they currently use need to be cleaned up. Within our regulatory framework, we have the programs in place that define what clean-up needs to be done to, the preliminary decommissioning plan that's currently in place, and then once BWXT is finished their operations, they're held to task to provide a detailed decommissioning plan.

So that might be a -- I'm not sure if I've answered the question specifically.

MEMBER DEMETER: So it's a really tough

question.

So if you're a historian, you look at this, you'd say back in the time of Port Hope-Port Granby there was a regulator, there was a licensee and it's led to this prolonged clean-up of low-level waste. What's changed to give comfort to the public that the current regulator and the current licensee aren't going to go down the same road?

MS TADROS: Haidy Tadros, for the record.

So continuous improvement, continuous improvement of standards, but I believe we have colleagues in Ottawa that can speak to the specific issue of legacy and what has changed between then and now.

MR. RINKER: Mike Rinker, for the record.

Sorry. I'm not in Ottawa, but I wanted to add some context.

Particularly in Port Hope, and I think the intervenor did a very good job of describing some of the history better than I can. Her experience is certainly much longer in Port Hope in understanding the history.

But decisions were made that we would never make today.

There was contaminated waste, contaminated

material, things that we would call uranium mine tailings that were used for backfill in roads, for backfills, and it's a very beautiful, hilly town in Port Hope. Some properties are quite flat in the back for gardens and so on because material was used that had -- has uranium contamination and arsenic contamination for the wrong reasons.

There's -- it was done by a company federally, Crown corporation. There's a government obligation now to go in and remediate those properties and to put them into a level of -- return that town back to its -- the way it should be.

THE PRESIDENT: Dr. Berube.

MEMBER BERUBE: Yeah, I just want to go back to -- quickly to the financial guarantee amounts.

So we've got international model that basically allows you to calculate the activities as well as the financial amounts for that guarantee. That's pretty much an industry standard, correct?

What I want to know is, how do you deal with the time value of money in that? In other words, how do you deal with the inflation component? Because you know, \$10 million today is not \$10 million in 10 years,

especially with potential hyper-inflation. How do you actually deal with that aspect of this?

MS TADROS: Haidy Tadros, for the record.

So that goes into our estimation, so Ms Karine Glenn can speak to that.

MS GLENN: Karine Glenn, for the record.

So the decommissioning plan and the cost estimates for the BWXT sites uses a decommissioning tomorrow assumption. So the total amount of the funds that are in the financial guarantee today is the amount that would be required if they shut down operations any day and not deferring the decommissioning in to the future as we see for some of the larger licensees such as the nuclear power plants. So it's a different type of assumption.

In order to ensure that these remain current, the financial guarantees have to be revised every five years. And they cover that five-year period and they use an escalation factor to account for inflation over that five-year period and to ensure that the amount is sufficient for the five years.

If there were major changes in their operations, they would need to come back and validate that that financial guarantee is still sufficient.

The Commission can request that it get reviewed at any time in that five-year period as well. And, in addition to that, I mentioned in one of my previous responses, we do require the licensees to report annually that the financial guarantee continues to be in effect and valid. And in the case of BWXT, again, they must provide the rating of their bond provider.

So all that comes into ensuring that at any point in time should BWXT no longer be in existence, there would be sufficient funds to conduct the decommissioning.

MEMBER BERUBE: So I just want to verify that -- BWXT has asked for the opportunity to move their pelleting project from Toronto to Peterborough. I just want to verify that the financial guarantee would have to be in place before that facility was commissioned and running.

MS GLENN: Karine Glenn, for the record.

That is correct. Right now, the decommissioning costs include the decommissioning of pelleting operations at Toronto. If they move those to Peterborough, they will need to revise the costs for the Peterborough decommissioning accordingly.

We don't expect those costs to vary, you know, given the contingencies that are in place, so the total amount of the financial guarantee should remain more or less the same, but they will be required to provide evidence of that.

THE PRESIDENT: Dr. Lacroix.

Okay. Well, thank you.

Ms More, over to you for any final words.

MS MORE: Thank you.

I wanted to just comment that you will be aware that Cameco found discharge underneath its building that was making its way into Lake Ontario, and that was a surprise finding. So with any operation like this, and I know it's got a long history that pre-dates this firm, you will need to be very wary of the proper costs and the damage done on the property over the years and try to sort out who should be responsible because there have been different owners and operators who've brought different kinds of material. So there may be some nasty surprises on that property.

I think just closing with the recommendation around the licensing simply for the purpose of decommissioning and facing the fact that this plant

would never be allowed there today, and that is not a small thing.

As a regulator, I think you just have to make a commitment to stop grandfathering what are essentially historical mistakes. They do present real risks and dangers to communities where they are located, and it really is unacceptable in this day and age.

And one other point I'd like to make is about the clean-up going on in Port Hope.

Some years ago, our committee met with a director at Natural Resources and the Mayor of Port Hope, and he was very supportive of us getting health monitoring to occur throughout the clean-up. And I want to remind you that this clean-up is proceeding under your auspices with no health monitoring of the population and there is dust, there is digging going on and there is remediation, trucks going through the streets, trenches dug around houses while people are still living there. And there are no health studies happening and no health monitoring.

And that goes back to who you are and what your job is and the trust that you want us to have when you say this is safe, why don't you believe us.

You should know why we don't believe you

and you need to step back and think about what your role is as an independent regulator and call some people to account and put in proper processes.

Our committee has asked you for health monitoring over the years when there have been -- the environmental assessments were going on, and it gets glossed over probably because the proponent doesn't want to bother.

But these are all important factors and they go to the credibility of your role as a regulator, which is severely damaged, may I say.

Anyway, thank you for listening and for your consideration.

THE PRESIDENT: Thank you for your submission.

Our next presentation is by Mr. James Wilkes as outlined in CMD 20-H2.160.

Mr. Wilkes, the floor is yours.

CMD 20-H2.160

Oral presentation by James Wilkes

MR. WILKES: Thank you, Commissioners.

Bonjour, hello. James Wilkes.

My name is James Wilkes, W-i-l-k-e-s, for the record. I am a guest in this territory, the land of Michi Saagig Nishnaabeg, who have forever maintained responsible relationships with this land and territory long before European exploration and long before Canada.

I am a settler and immigrant Canadian and a resident of Peterborough for 14 years.

As a treaty partner in this land, I have a responsibility to help protect the lands, waters and the plant, animal and human communities with whom we share the land. This is a responsibility shared with indigenous peoples and a commitment to the future generations of all life.

I have worked as an instructor at Trent University for six years now, and I have taken a keen interest in the nuclear fuel chain for over a decade from uranium exploration and extraction through processing, to nuclear energy production and nuclear waste disposal.

That said, I'm neither an ecotoxicologist nor a radiologist with expertise in radiation exposure. Instead, I'm a cultural ecologist with an interest in connections between indigenous peoples, cultural diversity

and biological diversity.

The nuclear industry threatens these diversities at all levels.

One of the reasons I'm here today is to help test the honour of the Crown. On the first day of the hearings, I noticed the coat of arms behind you. Very representative and symbolic of the Crown.

Too many times to count, however, the Crown has failed in its responsibilities to Canadian citizens and to indigenous nations within the borders of Canada. According to CNSC RegDoc 3.5.3, the CNSC is the sole authority in Canada to regulate the development, production and use of nuclear energy and the production, possession and use of nuclear substances, prescribed equipment and prescribed information in order to prevent unreasonable risk.

First of all, what constitutes unreasonable risk? Does manufacturing nuclear fuel pellets in an urban area using large quantities of explosive hydrogen constitute unreasonable risk?

Does manufacturing nuclear fuel pellets using uranium dioxide powder within two kilometres of eight schools constitute an unreasonable risk?

And does the emission of uranium particulates, which are alpha radiation particles known to cause damage to lungs and to bones if inhaled or ingested, constitute an unreasonable risk?

I also question the zoning, as many others have. Why is this industry being allowed to operate across the street from a school on land that we're learning is already contaminated?

I understand that people had much less information and data when GE first opened in 1892, but surely we must know better in 2020 than to make uranium fuel bundles beside schools.

According to the same regulatory fundamentals document mentioned earlier, the Canadian Nuclear Safety Commission has a central role in CNSC operations and operates at arm's length from the government, with no ties to the nuclear industry.

I question, then, why does it appear that the CNSC Staff, as the regulator, is acting on behalf of BWXT? I question also why the CNSC is spending Canadian taxpayer dollars to support a private corporation.

Why did we learn yesterday that the CNSC Staff is recommending that the Commissioners, you -- that

you accept BWXT's proposal to manufacture pellets without first hearing from the intervenors over these three days?

I ask, where's the transparency? What are the ethical guidelines to ensure a conflict of interest is avoided? How can the CNSC actually conduct an accountable review without such conflict of interest?

It seems suspect that BWXT or the CNSC, for that matter, would be trustworthy in its environmental monitoring and safety reviews. As with any self-regulating industry, the public must remain doubtful of the claims made by the proponent.

As a university instructor, an analogous example might be assigning essays to all of my students and then asking each student to grade their own paper. Would they behave ethically? Would all students tell the truth?

If not, do you truly believe that BWXT would tell the truth? Would the CNSC Staff, also self-regulating, tell the truth?

I wonder why any of us should trust BWXT or the CNSC.

I understand this Commission is designed to be an independent third party monitor to test the credibility of BWXT's claims, but it appears as though CNSC

Staff is helping BWXT at every step.

It is also irresponsible and deceptive of the CNSC to compare radiation from dental x-rays and long-distance airplane flights to make it appear that uranium dioxide powder is safe. These are different radiation types altogether.

The CNSC is well aware that we don't breathe nor drink x-rays. Uranium dioxide powder, on the other hand, is a source of alpha radiation. Alpha particles can be ingested through breathing contaminated air or through drinking contaminated water.

I ask you today, who among you will be accountable if a child, a young mother or anyone else was to get sick or die as a result of your decisions? Please do not use technicalities and legal loopholes to deny your responsibilities to the people of this community and the people of this Michi Saagig Nishnaabeg territory.

None of the community members present at this hearing has time for this work. We don't have time to spend weeks and months researching an industrial process, a process which the industry deems safe according to its own standards, yet we do make time for this. It is our responsibility as human beings.

Workers, scientists, medical professionals, indigenous peoples across Canada, they have warned us about the risks and the consequences of the nuclear industry. So here we are, on the streets, meeting with neighbours, studying the data, pushing our elected officials to respond and here in front of you this week.

How will future generations view your actions and decisions in this lifetime?

As a Crown entity, what you are doing in our name must be just and it must be honourable and not merely follow the baseline standards of the nuclear industry. Please do not let economic profitability cloud your judgment in the review of BWXT's proposal.

Curve Lake First Nation and Hiawatha First Nations have requested a deferral of the decision until deep and meaningful consultation has taken place with the proponent. John MacQuarrie and Nathalie Cutler, both of BWXT, have agreed today, this very morning, to the First Nations' demands for deeper consultation.

But I did not hear any agreement, nor commitment, from BWXT or the CNSC Staff to defer the hearings or the decision.

I challenge the CNSC to demonstrate that

it is actually considering the concerns of First Nations rights holders as well as an unprecedented number of citizen intervenors. If you are not merely a rubber-stamping body for BWXT, prove it.

Go beyond the current expectations of industry. Show us that you are truly listening. Prove that the decision hasn't already been made.

We'll know we've been -- we'll know you have considered your responsibilities and everyone's urgent concerns once we see accountable and meaningful changes to the decision-making process and to the decision itself.

Thank you, and miigwech.

THE PRESIDENT: Thank you for your submission, Mr. Wilkes.

Dr. Demeter.

MEMBER DEMETER: Thank you for your submission. It's a lot to take in.

And I don't have a specific question because part of this whole process, as you -- if you've been here for a bit is we've gone back and forth and probed and challenged and discussed dose at the fence line, whether it includes inhaled particles as well as external, and we've pushed a lot of issues. And there was a large

discussion on the back and forth between the licence applicant sending stuff to the staff and the staff sending it back saying that that doesn't meet our standards.

And so by the time it gets here, it has gone back and forth a lot to the point where the licensee is unlikely to present anything to staff that they won't recommend, so it's got to meet that standard.

So the optics are at the end game, it looks like it's all tied up, but we had like two large discussions on that.

I'm not sure what I can say to increase your confidence in the process other than to say personally at the end of the day, I take all of this in as an independent Member of the Commission and make a decision based on safety and security.

And that's the only thing I can respond to, that I do feel that I'm independent and I make a decision based on the interventions, staff and the licensee putting it all together and what makes sense from a safety and security point of view.

Thank you.

THE PRESIDENT: Dr. Berube.

Dr. Lacroix?

Dr. McKinnon.

MEMBER MCKINNON: Yes. I think, like Dr. Demeter, we have covered a lot.

Sometimes when we talk about, you know, the hazards of ingesting uranium and what one particle might do, it's very hard for us to really relate to that. You know, what does that mean?

We're dealing with a lot of abstract numbers and effects.

So I'd just like to make a request to -- for staff. We've talked earlier about uranium. We live with radioactivity. It's in the background. It's everywhere. It's in the water, the ground, everything.

So if I have a glass of water, let's say, from -- not from Peterborough, just so we're not biased, but from a natural spring source somewhere in the country, would it be likely that there would be uranium in that?

MR. RINKER: Mike Rinker, for the record. I'll take that directly.

There is -- Ontario publishes a drinking water surveillance program where they measure the constituent concentrations of things like uranium, but many others, and they publish this. You can download the Excel

spreadsheet if you're so interested.

And so I was looking around the province to see what the uranium values are, and they range on the low side of 0.1 micrograms per litre in some areas up to as high as five micrograms per litre in others.

And these are areas that are far away from Peterborough or other uranium industry, but of course, uranium occurs quite naturally. It would be much higher, say, in the mining areas like Bancroft and Bicroft. It can be quite high. But it is safe to drink. It is below the Canadian -- the Ontario drinking water standard or the Canadian guideline, which I believe is 20 micrograms per litre.

So it does vary. And it's in the air we breathe. We're breathing it right now. We would be breathing it in the north or the south of Ontario.

MEMBER MCKINNON: So many intervenors have talked about the -- you know, the damage caused by breathing in only once, but you know, when you're talking micrograms per litre, you're probably talking billions or huge numbers. Would that be correct?

MR. RINKER: Mike Rinker.

That would be correct. And we've been

breathing and drinking it since we were born.

THE PRESIDENT: And on a similar note, the intervenor says, you know, probably not quite as appropriate to compare breathing uranium dust to an x-ray or traveling in air. Perhaps comparison to radon that's naturally occurring that's also got alpha radiation may help better compare.

So can you comment on that?

MR. RINKER: Mike Rinker, for the record.

So in general terms, and we could be more precise, but in general from natural radiation we get the most of our dose from the natural resources, it's from radon. And we get other types of radiation such as x-rays and medical types which is about equal to the natural source.

But a significant dose, way more than what you would get from living near a nuclear facility like BWXT, is from radon inhalation.

MR. JAMMAL: If I may, Madam Velshi -- if I may, just to complement my colleague, Mike, with respect to the inhalation, I mean, Dr. Demeter tried to give a perspective of what a dose is all about, but for the intervenor I think it's very important to understand that

every time we take a breath, we are metabolizing into carbon-14. In our bone, there is potassium that is radioactive, so it's -- this is how we are. That's how we are being composed.

So the exposure, as Dr. McKinnon is saying and Mike is saying, it's background radiation existed since I'm going to say humanity existed.

THE PRESIDENT: Okay.

Mr. Wilkes, last word for you, please.

MR. WILKES: Thank you, Commissioners. I know it's beyond the scope of the Commission to consider the nuclear fuel chain, but in the context of my -- of my written submission, remember that the processing of a nuclear fuel pellet is just a sliver of the whole chain, that uranium extraction, uranium mining takes place in indigenous territories without consent.

Indigenous -- uranium processing also takes place in indigenous territory without consent and then nuclear waste disposal takes place in indigenous territory without consent.

Article 29 of the United Nations Declaration on the Rights of Indigenous Peoples, to which Canada is a signatory, states the following:

"Indigenous peoples have the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources. States shall establish and implement assistance programs for indigenous peoples for such conservation and protection without discrimination."

And the next point is highly, highly important:

"States shall take effective measures to ensure that no storage or disposal of hazardous materials shall take place in the lands or territories of indigenous peoples without their free, prior and informed consent."

I'd like to echo what Chief Emily Whetung and Chief Laurie Carr said this morning, is that they're not against development, they're not against this proposal. But they have not agreed to it and they have not been properly consulted.

They have not been deeply consulted,

meaningfully consulted and they have not provided their consent.

Canada still fails to recognize the right to say no, but at the very least there can be some deep and meaningful consultation.

Thank you.

THE PRESIDENT: Thank you. Thank you for your intervention.

We'll now break for dinner and reconvene at 7 o'clock. Thank you.

--- Upon recessing at 6:06 p.m. /
Suspension à 18 h 06

--- Upon resuming at 6:57 p.m. /
Reprise à 18 h 57

THE PRESIDENT: Since most of the key players are here, we can get started.

The next presentation is from Adam Prinsen, Laura Anderson -- oh, I'm sorry, are others joining you?

MR. PRINSEN: No.

THE PRESIDENT: You are on your own then.

As outlined in CMD 20-H2.167, 167A and 167B.

Mr. Prinsen, over to you.

CMD 20-H2.167/20-H2.167A/20-H2.167B

Oral presentation by Adam Prinsen

MR. PRINSEN: Hi, I'm Adam Prinsen. I'm a naturopathic doctor in Peterborough and I'm speaking on behalf of a group of naturopaths in Peterborough, including Wei Wei Han, Laura Anderson, John Miller and Brenna Steels.

The main question that I want to address in my intervention is: Can inhaled uranium cause lung cancer?

I did a little bit of research and our group did a little bit of research. I think there's a lot more research that could be done. This is the first study that I found and it was done on beagles. Pulmonary adenomas and adenocarcinomas were found in beagle dogs after they were intentionally exposed to inhaled uranium. The incidence of tumours was 50 to 100 times higher than the expected rate of spontaneous tumours.

I'm just going to go through a few

studies.

There is a rat study that we found where rats were exposed to uranium ore dust that did not have significant radon in it. Those rats had significantly higher rates of malignant and non-malignant lung tumours.

Another study, a case control study where the researchers aimed to quantify dose response relationships between lung dose from alpha emitters and lung cancer in nuclear workers. These were people that were dealing with uranium processing. They found strong evidence for associations between low doses from alpha emitters and lung cancer risk. Risk estimates were similar to those estimated previously in uranium miners that were exposed to radon in its progeny.

Then there was an epidemiological study that we found. Strong evidence that internal lung exposure to alpha emitters in the lung increases lung cancer risk even at the low doses experienced by nuclear workers.

One of the things they said in that article I read was that carcinogenic risks of external exposures to alpha emitters are poorly understood, except for radon of course because there's lots of research on radon. And it's a public health priority to understand it

but we still need more data to understand it.

So can inhaled uranium cause lung cancer?
Yes, there is evidence that it can.

I watched a presentation this morning at home on the internet. Dr. Vakil was speaking and she pointed to a lot more research. So I believe she's done far more research than I have. She also indicated that there is a lot of data around that shows that alpha emitters in low doses do increase rates of lung cancer when they are inhaled.

This is from the World Health Organization. All radionuclides that emit alpha particles have been shown to cause cancer in humans and experimental animals. Uranium is an alpha emitting nuclide, so it can cause cancer.

Uranium dioxide particles are insoluble so when you inhale them, they can remain in the lungs for years. I mean I'm already saying stuff that you already know.

This picture I really like a lot. I think it's going to help me explain something that I think is really important.

So this picture I got from Gordon Edwards

that he put in a presentation he did. It's a picture of lung tissue with an alpha emitting particle that's in the lung tissue and it is emitting alpha particles. You can see how the alpha particles radiate off it and damage the lung tissue right around that particle.

It's not damaging the whole lung; it's damaging a small area of lung tissue. That's important.

This is from the UMRC, the Uranium Medical Research Centre. An average sized -- and this is stuff you have heard before from other people, I know.

An averaged sized inhaled 2.5 micron fragment of uranium delivers 340 rems of radiation per year to the tissue that is surrounding it. That means that it -- what that means is if you inhale a particle of uranium, that particle, if it's 2.5 microns in size, emits 68 times the permitted annual dose for radiation workers in a dose that's 200 times higher than the legal dose limit for the Canadian population.

And this is the thing that I do not believe is being correctly understood. When you look at the picture, this particle that is emitting alpha particles, it's not affecting the whole lung. So when you calculate effective dose -- like that was just talked about

before with Philip's presentation.

Someone said, you know, you have to use the whole organ mass. How does that make any sense? When you look at this particle that's emitting alpha radiation, that radiation is not affecting the entire organ. So if you calculate effective dose using like a kilogram of tissue, that means you are taking that amount of radiation that's getting emitted from that particle and you are saying it's getting spread over that whole organ.

That's like if I took a cannon ball and shot it at your car, it will dent the side of your car. Maybe it will do more than that. Maybe it will hurt the people inside the car.

But if you take that amount of force and say oh, I'm going to do a calculation where we spread that amount of force over the entire vehicle, then what's going to happen? Maybe it's not going to be a significant dent in that car. Maybe you're just going to say oh, some force hit the car but it didn't create significant damage.

So that's why I'm saying the calculations that are being used for effective dose are completely misleading. When you ask your dosimetry expert -- I was listening to that this morning, Mr. Thériault, I found that

his answers were misleading. I didn't think that he explained it very well.

I looked up how effective dose is calculated. It says here: If only part of the body is irradiated, then only those regions are used to calculate the effective dose.

So that's really important to understand.

The other analogy that I had is if you put your hand in the sunlight, you are outside and you put your hand in the sunlight, there is radiation hitting it from the sun. Okay, so after an hour of that, your hand gets a suntan.

But if you take a magnifying glass, if you take all that radiation that's hitting your whole hand and you put it on a 30-micron sized part of your hand, then it's going to burn a hole in your hand.

So by showing calculations the way that you are doing, it's misleading. The effect of the alpha particle radiation is not being viewed correctly. I just wanted to make that clear.

The next slide.

Alpha radiation and its effects on localized areas of lung tissue is not being accounted for

in BWXT's risk assessments, and I just don't think that's it is being properly understood, period.

I think Mr. Thériault said this morning that the calculations that they used, they have been calculating those that way since the 1970s. I think that's what he said.

So Health Canada's method of calculating - - this is from the UMRC. Health Canada's method of calculating radiation doses to average the radiation over the body weight of the town's residents. That's what the UMRC said.

I guess if you are just looking at one lung cancer, you are going to use the weight of the lung, which is also misleading.

Health Canada's method ignores ionization effects and the energy transfer at the organ, tissue and cellular level. This is what Gordon Edwards was pointing to. This is what the UMRC is pointing to. And I think there are other scientists that are pointing to the same thing. You have to sort of update your understanding of the physics so that it is an accurate assessment of what is possibly happening.

I think there is lots of research that

needs to happen.

This is another excerpt from a study that I read that I wanted to include. It says: The potential for adverse health effects related to releases of radionuclides is directly related to the population density near the processing facility.

I mean, that seems sort of obvious but I wanted to put a reference in there for that just because it doesn't seem logical to put a facility like this in the middle of a city.

I don't think it should exist in Toronto. I don't think it should exist in Peterborough, in the middle of a city where there are people living, where there are children playing across the road.

Next slide has to do with Port Hope, and this is also from that article that I found from the UMRC.

They are saying that there has been insufficient analysis of Port Hope's unusual patterns of coronary disease and cancer and their possible association with daily emissions and chronic internal exposure to insoluble radiogenic toxins into the town's breathing zone.

Yes, that relates to another study that I read and Dr. Vakil this morning alluded to that one as

well. There was a study that showed that there are higher rates of lung cancer in Port Hope, especially among women. And women are known to be more sensitive to radiation. So that's kind of coincidental, or maybe not.

In the study it was sort of written off as possibly being related to smoking because the rates of lung cancer in Port Hope are similar to other areas in Canada of similar socio-economic status.

I don't think that you can write it off that easily. Obviously Port Hope has an issue with radioactive waste. They are doing that \$1.3 billion clean-up operation.

It's funny, I didn't even know much about that before I got into learning about this stuff.

But it's definitely conceivable that the lung cancer rates in Port Hope are related to radon or uranium dioxide particles.

The next slide just says: Do CNSC decisions and safe levels determined by the CNSC protect the public?

I read this thing that Gordon Edwards wrote. He wrote: Since the town of Port Hope has been thoroughly contaminated with alpha emitting radioactive

substances, the Canadian nuclear authorities had to make a political decision back in 1975. What was an acceptable level of radioactive contamination in a private residence? So a standard for an acceptable level of radon contamination in a private home was set at about 20 times the normal background levels of radon to guide the clean-up operations at Port Hope. In testimony to the Elliot Lake Environmental Assessment Board in 1978 mortality figures published by the Ontario government were used to show that even the acceptable levels of radon contamination in homes would result in an extra 17 lung cancer deaths per thousand people chronically exposed to such levels. In other words, instead of 54 lung cancers per thousand, one would expect 71, a 31 percent increase.

In light of this evidence the Board recommended that the radon standard for homes be reassessed, but no such reassessment has taken place. Since 1980 the B.C. Medical Association has published a slightly higher risk estimate and has condemned the radon standard for homes as tantamount to allowing an industrial induced epidemic of cancer.

A 1982 report published by the Atomic Energy Control Board concurs, estimating a 40 percent

increase in lung cancer among those living in homes that are contaminated to the acceptable radon level.

THE PRESIDENT: Mr. Prinsen, you are way beyond your time. So can you wrap it up, please?

MR. PRINSEN: Okay. I'm pretty much done. I just don't think that it's responsible to put this type of facility in a city close to an elementary school, like other people are saying. Alpha radiation hasn't been accounted for and not understood properly. And if there were any accidents, it would be even worse. I don't know how many people, you know, end up getting cancer from the amount of particles that are being released. Maybe it's not that many. But, I mean, if an alpha particle does enter someone's lungs, which it will, it is significant.

Please deny BWXT this pelleting licence.

THE PRESIDENT: Thank you for your submission.

Dr. Berube? Dr. Lacroix?

Dr. McKinnon.

MEMBER MCKINNON: Yes. I wonder if you put up the image showing the radial tissue damage.

I have a question for CNSC staff because

we heard that we are ingesting lots of uranium just on a regular basis through living, and yet this image is pretty alarming to think that that's happening all the time.

First of all, I would like to question --

MR. PRINSEN: It's happening in the lung, not the digestive tract.

MEMBER McKINNON: Okay. I'm not sure, has the epidemiologist perhaps seen an image similar to that? I'm not sure what the source of such an image is, first of all.

Would that kind of damage occur?

I have a hard time imagining that's occurring just through the normal quantities we would be ingesting.

Perhaps staff could comment.

MR. PRINSEN: Inhaling.

MEMBER McKINNON: Or inhaling, yes.

MS TADROS: Haidy Tadros, for the record.

I would ask our health specialists to speak to that question, please.

MR. RINKER: Mike Rinker, for the record.

We don't know the source of the image. I think that's all we can say about the image.

We can talk about the amount of research that has been going on globally and within Canada, and particularly about workers exposed to uranium. So we do have a very solid understanding of the relationship between exposure to uranium and the health impacts, if you are interested.

MS RANDHAWA: And I can speak more to that as well.

I'm not sure where the source of the image is from -- sorry, Kristi Randhawa, for the record.

There are many studies that have been done looking at uranium as an alpha emitter as well as an internal alpha emitter, particularly in this volume in this annex. There are some animal studies where we have seen exposure or higher exposures with the potential of tumour formation or effects on the lung.

I'm not sure if this image could relate to some of those animal studies.

In terms of studies on workers, CNSC is involved in research on uranium workers. We are part of the International Pooled Analysis of Uranium Workers where we are looking at, I believe, 16 cohorts, international cohorts of uranium workers. We are pooling dosimetries so

we can look more specifically at effects of uranium.

We are also part of the Canadian Uranium Workers Study where we are looking at miners, processing workers and millers all throughout Canada, and this will update us on potential effects and will include workers from BWXT as well.

So currently we are involved in research. We are reviewing the research. We understand that there might be some uncertainties but we look at animal studies. And because of that these dose limits are set low to account for those. So even though we might see some evidence in animal studies, some weak associations in human studies, that is taken into consideration. And that is why the dose limits are so low.

MEMBER MCKINNON: Thank you.

THE PRESIDENT: The studies that you referred to, what is the likely timing where preliminary results may be shared?

MR. RINKER: Mike Rinker, for the record.

So many of the studies have been completed and they are available on the CNSC website.

The reason why we update is there is dose information in the National Dose Registry and it's linked

to statistics of cancer incidents and cancer mortality, and there is a latency period between the two.

So the published data for now accounts for workers up until the year 1999. We are now in the process of extending that time to get more recent studies.

THE PRESIDENT: Thank you.

Dr. Demeter.

MEMBER DEMETER: Thank you, Dr. Prinsen, for the presentation.

I want to know if staff have had a chance to review the referenced literature that was in the slide deck. The references in the presentation slide deck, they are in numbers, and they are accessible through the written by hyperlink.

MS RANDHAWA: Kristi Randhawa, for the record.

I have reviewed some of them. I might have reviewed all of them. I've been through so many studies through these interventions, and I can't get into my document to see what the references are right now.

For example, if we look at the beagle study, which is an older study, the beagles were exposed to very high doses. So I think it might have been six or

seven grays. So these were very high exposures.

The worker studies, I most definitely have seen them but I don't have the references right now.

And apparently many of them are our studies.

MEMBER DEMETER: Sorry?

MS RANDHAWA: Kristi Randhawa, for the record.

Some of them are our studies that are referenced.

MEMBER DEMETER: Okay. I don't know, I need to ask a radiobiology question.

The slide with the star-shaped effect is probably an autoradiography picture with all these tracks and these alpha particles are like you might think of a ping pong ball as a photon and the thing in Indiana Jones that's rolling down that he's trying to skip as an alpha particle. And when it hits a cell, the cell has three choices: nothing happens, it gets damaged enough that it just goes away or it gets damaged and it repairs itself or it gets damaged and doesn't repair itself well and goes forward.

And that's the risk one that you want, if

it mis-repairs.

I don't know if anyone from CNSC technical staff can answer this question.

In the background of our biology, every one of our cells goes through DNA repair constantly and this kind of injury adds to that background of DNA repair and DNA mis-repair.

The question is: This has one or two cell penetration, this little star shape. It doesn't go beyond one or two cells. And that in the soup of all the other repairs, what is the contribution of that to the bigger picture? And can we even detect it if it has a contribution?

I don't know if there's anyone that would be able to talk about the radiobiology of this compared to natural biology. Maybe someone in Ottawa.

MS TADROS: Haidy Tadros, for the record.

I will ask our colleagues in Ottawa to see if they can perhaps elaborate a little bit on Dr. Demeter's explanation of the effects of radiation on the body when energy is deposited and what happens with regards to repair.

MEMBER DEMETER: Yes, more so the relative

proportion of natural repair that's going on without radiation. Like our body is dealing with radical oxidants and chemicals all the time. And there is a certain number to that, that I don't want to say because I want the staff to think about it. And this would add to that.

But the whole issue of risk prediction is how much does it add to it and can you even detect that incremental difference?

MR. RINKER: Mike Rinker, for the record.

So some time ago, I think about 18 months ago, CNSC health sciences scientists made a presentation to the Commission publicly. It is in CMD 17-M46. It talked about the bystander effect amongst many others, and it included some data. And we will have the health scientist available tomorrow to answer this.

But on the order of 20 double strand breaks per hour per cell is a natural frequency of the more significant cell damage that would occur. And the radiation dose such as what we saw in the picture would add to that type of repair that would be needed.

So I think we can come back with more detail when Julie Burttt would be available, who made that presentation and has that information.

MEMBER DEMETER: So I guess I'm not denying that there will be some cellular damage by these particles. The issue is how many of them survive the damage and how many of them decide to take a hike and the cell will actually shrivel up so they can't get any more damage? And they will be the ones that mis-repair.

It's the issue based on all the other injuries our cells deal with and repair and don't repair every day, what is the significance of that in this whole picture?

And based on epidemiological evidence we've been told, the ability to detect that incremental increase in aqua genesis as a specific outcome is very difficult given the prevalence of cancer and the small incremental risk.

So I'm not denying it does damage to the cells. I'm looking at it from a risk perspective of what does that amount to in a population and can we detect it?

MR. PRINSEN: Well, if one person got cancer, like say it was your wife or your kid, would it be worth putting the facility next to your kid's school, if it was your kid?

THE PRESIDENT: So we won't -- I mean it's

not a question to pose to us. It will be exactly those kinds of questions that we will be deliberating on.

So, Mr. Prinsen, I will turn to you for any final comments.

MR. PRINSEN: Well, that's my final comment. I mean, I don't know what the risk is exactly either because I don't think anybody really does. But that doesn't mean it is safe and it doesn't mean it is a good idea to have it in a city.

THE PRESIDENT: Yes, we hear you. Thank you.

Our next presentation is by Mr. Nick Lato, as outlined in CMD 20-H2.187.

Mr. Lato, over to you.

CMD 20-H2.187

Oral presentation by Nick Lato

MR. LATO: Hello. Thank you.

My initial written submission had to do with perceived risk and I was here this morning when Dr. Velshi asked BWXT how they approach the problem of perceived risk in the community, and they -- John

MacQuarrie said that they will do better, they will have more outreach and tell people more about how it's completely safe. But that -- that doesn't really solve any problems because there are medical experts who have differing opinions who are just as qualified as BWXT's medical experts. And so the corporation profiting off this business assuring the public that it is completely safe is not going to eliminate the perceived risk in the community, especially since you sort of have to be somewhat of nuclear medical doctor to -- to really understand this type of information.

So it's -- I don't know, it just seems like a -- it seems like not an answer at all to say that that's how the company is going to deal with the problem of perceived risk in the community.

I am not familiar with the Canadian Nuclear Safety Commission like prior to this, but I assume from the title that they were an independent body. They've determined like when we're safe and what wasn't.

And from being at these hearings it very much feels like BWXT and CNSC are part of the same team. They both don't speak in -- or, in very little grey, and they're both here just assuring everybody that everything

that's happening is completely fine and nobody has anything to worry about, and I think it's problematic for this -- that this Tribunal is two organizations who have tables of staff who are being paid to be here and to prepare for this, essentially arguing against the community members who have done research in the last few months since they've hear about this plant, and we have a couple of experts, remotely. So, it just seems like the tables -- that things are slanted against us by virtue of that it's we're arguing against professionals, and I just feel it's -- I feel this Tribunal is like being educated in this process but it's difficult for you guys because you're -- it feel that CNSC should be helping you understand information as opposed to just trying to present everything in the most favourable light.

In regards to the beryllium levels that we've been talking about, I read in the newspaper this morning that BWXT says that they are like convinced that they are not the source of increased beryllium in the soil at Prince of Wales and I have heard CNSC say that, like, 'Oh, don't worry, they're still like well below the levels which are well below safe.'

But the large unanswered question is how

did the beryllium get there? And, it is not -- it's sort of like misdirection for CNSC to be trying to reassure us that it's safe levels, because BWXT is reporting that negligible levels through their stack and the increase has been non-negligible. And so regardless of if BWXT is responsible for the increase, regardless of how it happened, whether it's through deceit and trickery of testing, or whether it's through like ignorance of their own processes and it just so happened that they weren't testing the stack when the beryllium was released, like however that happened there's not real way for BWXT to be releasing beryllium that they're not reporting, leading to increased soil levels that would make it acceptable for the licence to be granted.

And I've heard a lot that there's going to be like more monitoring and all that, but it just seems -- it seems like -- it seems really problematic that at the final hour we're being promised these things, but there should have been -- there clearly should have been more robust testing this entire time to either show that BWXT is releasing too much beryllium or they're not. Like it -- this doesn't seem like the place for these discussions.

I don't know how you can -- how a further

licence can be granted when there's massive unanswered questions about what's happening right now. And given that they have no plans or had no plans to move right away, it seems like they should, so it would probably be sorted out first.

We should probably know what is happening with the soil and how it's getting there.

I guess in closing, back to the perceived risk. I mean I don't mean to use the term "perceived risk," as something non-serious because like I'm among the people who do perceive there to be a risk, and it would concern me, and it would like stress me out if this plant was you know producing or pelleting uranium.

But, given that at very minimum there is going to be mental health damage from the perceived risk, it seems like that in and of itself is good enough reason not to have this location there. I don't understand why it needs to be there.

It seems like the only reason -- the only reason for that plant to be there is that the land is already so dirty that no one else would rent it.

And supporting the principle of ALARA from BWXT it was brought up to have as low as reasonably

achievable radiation levels for the workers and I don't understand why that doesn't apply to the community as well. It's a very reasonable and achievable that the plant not be located in a residential neighbourhood next to schools.

You could do that. That's it.

THE PRESIDENT: Thank you for your submission, Mr. Lato.

Dr. McKinnon?

MEMBER MCKINNON: Thank you. Clearly, you're very concerned about many issues. Some of them we've addressed, but did I see the representatives of the Fire Department?

So I'd like to bring up one point in your written intervention and it's about the accidents and emergency risk management. So, I'd like to call on the -- if Fire Chief would be here? What has your involvement and the Fire Department's involvement been with the company? Are you aware of their emergency scenarios and are communications and preparations in place? Could you address that aspect, please?

MR. SNETSINGER: Chris Snetsinger, for the record.

The Peterborough Fire Services and

Emergency Management would meet annually with the BWXT officials to review plant operations, discuss emergency plans, response procedures. We also have the firefighters doing onsite tours at least once a year. And we do training exercises whether they be tabletop or functional. We do have an exercise coming up in June of this year and we will be having the firefighters participate in that exercise.

THE PRESIDENT: Has BWXT discussed the potential pelleting operation, and what implications that may have on the emergency planning?

MR. SNETSINGER: I have not been in those discussions. The City of Peterborough has a dedicated community emergency manager that coordinates, and we also have a Chief Fire Prevention officer that would attend the meetings with BWXT as it relates to the firefighters and the emergency plans.

Also, we would send our training officer over there to make sure that we're up-to-date on the plant operations as it relates to the operation happening in Peterborough at this time.

THE PRESIDENT: And has the Prince of Wales School been involved at all in any of the emergency

planning?

MR. SNETSINGER: From the Fire Services we would look at the Prince of Wales School as an all hazards emergency management approach from the City point of view. We look at that even with our vulnerable occupancies. But we -- I have not been part of those discussions with BWXT as it relates to our neighbour across the road.

THE PRESIDENT: Thank you. Dr. Demeter?

MEMBER DEMETER: I don't have any -- I'll leave my questions to later if there's -- let the other people ask emergency -- other questions at this time. I'll ask another question at the end.

THE PRESIDENT: Dr. Berube?

MEMBER BERUBE: So, for the Fire Chief. Obviously, you do inspections of the facilities for potential fire risks; that kind of stuff is a normal part of your job, I would think.

Do you have access to that information or how would you characterize the risk today of those facilities?

MR. SNETSINGER: So with an all hazards approach we would look at the city overall from our HIRA and how we would see different facilities and what risks

they would pose. Also, the transportation of whether it be down the 115 of through our community when it comes to hazardous material being moved. We would work in conjunction with our partners Allied Agencies, the TSSA, when it comes to inspections to make sure all the code requirements from where we would rely on our authority would be with the *Ontario Fire Code*. If it steps outside of our authority that's where we have to work with our partner agencies and we would do a community risk assessment. Should something new end up in our community, we would have to review that community risk assessment and we would call on our partners at the Ontario Fire Marshall's Office to give us some assistance with that.

THE PRESIDENT: Dr. Lacroix?

MEMBER LACROIX: Thank you Mr. Lato, for your intervention. I see that you have many concerns and I just want to make a comment.

The calculation of the risk and of a probability is a science and the perception of that risk is a feeling. And we on the Tribunal, we base our decision on the scientific data. We cannot base our decision on feelings.

I think that this work of perceiving the

risk itself, it's maybe the engagement of the company with the local residence. But as far as we are concerned on the Tribunal we must base our final decision on the scientific data. We have to ignore the perception of risk because the perception of risk, I repeat, it's a feeling and it's different for you, for me, for everybody else.

MR. LATO: Yes. I guess two points. I was also talking about the risk of not necessarily an accident but just the emissions being released. But you can, like mental health statistics are something that you can attempt to quantify, and I know that if there's children at the school who don't feel good about that, I know it's just a feeling for them, but again I ask, like why is this plan proposed to be where it is?

I think somebody has to account for the feelings of the community. If it's not you, I don't understand who it would be.

THE PRESIDENT: Dr. Demeter, did you want to ask your questions now?

MEMBER DEMETER: Yeah. After the larger discussion we had yesterday and this morning about beryllium and you brought it up, I just wanted to clarify, because we're looking for reasons for the apparent trend,

I'll call it an apparent trend right now, that doesn't seem obvious based on the air emissions to date.

I wanted to get clarification from BWXT how the air emissions are quantified? Is it continuous monitor that -- is it periodic? How often? If it's continuous, how often do you sample? I want to make sure that there's no sort of sampling bias or we're missing a peak, so give me a sense of the air emissions monitoring for beryllium for me to see how robust it is.

MR. SNOPEK: Dave Snopek, for the record.

So there are three separate stacks that service the beryllium area. They are located beside each other, so they're one kind of unit right beside each other.

The monitoring for those three stacks is continuous at all times. The way it works is air, of course, is going through -- I'll talk about one stack, it's the same for all three. But air is pulled from the facility through a couple of stages of filtration. That last stage is hepa filter stage, which is the high efficiency particulate air, which is really what's credited to remove particulate from the air. The first is really a pre-filter.

Following the filtration there is in duct

sampling that takes place and what that is, is air is drawn from the duct, a small amount of air, across a filter paper, and that is drawing air and accumulating material on that filter paper over the course of one week. So at the end of the week we go and we extract that filter paper. We replace it with a new one and the system continues to monitor for the next week.

The paper that we've removed, we send to an outside laboratory to quantify the amount of beryllium that's on that filter paper. And when we get that result back we relate it to the volume that's been sampled to come up with a concentration, and it's that concentration that we look at and compare it to our internal control levels and action level and record it for our record-keeping purposes. And that's what we summarize in our annual compliance report for each of the three stacks.

MEMBER DEMETER: So there's no big gaps in monitoring? And is there a possibility that the particles that are coming through are too small to be filtered by the system you have?

MR. SNOPEK: Dave Snopek, for the record. HEPA filters are high efficiency particulate air filters. They are able to filter

exceptionally small particles and kind of common sense -- the common sense look at it would be that as particles get smaller and smaller they become more and more difficult to filter, which is true to a point.

There's actually a couple of different capture mechanisms within hepa filters and as you get to really small particles the efficiency of the filter actually gets higher again. So that means that there's actually a worst case particle size for filtration and it's around .3 microns. And below that, particles actually get captured more efficiently by hepa filters. So hepa filter efficiency is actually specified at .3 microns, because that's right around the most difficult particle size to try and capture. Other particle sizes, it actually captures with higher efficiency.

MEMBER DEMETER: Thank you very much.

THE PRESIDENT: Mr. Lato, anything else you want to add?

MR. LATO: Yeah. It just seems very inappropriate. It's not -- it's not the place for this type of thing.

Thank you.

THE PRESIDENT: Thank you for your

intervention.

--- Applause / Applaudissements

THE PRESIDENT: The next presentation is by Sarah Vandenberg, as outlined in CMD 20-H2.201.

Ms. Vandenberg, the floor is yours.

CMD 20-H2.201

Oral presentation of Sarah Vandenberg

MS VANDENBERG: Hello. My name is Sarah Vandenberg, and I'm presenting on behalf of myself and three other women who also have children at schools in proximity to the proposed -- well, the current BWXT site.

I live in Lakefield with my husband. I've been married for 19 years. I have two boys, they're four and six. And I teach visual art in Lindsay; I'm a full-time high school art teacher.

I'm a first generation Canadian and the seventh generation on my mother's mother's side.

First, I want to acknowledge this land where we are. It is the traditional land of the Mississauga and Chippewa Nations covered by the Williams Treaties and Treaty 20. (crying) I'm sorry, it was a long day.

I just want to acknowledge the Williams Treaties First Nations as stewards and caretakers of this land and I acknowledge the responsibility and the care they have taken of this land.

Before anything else, I would like to urge that we consult our indigenous communities for their input and leadership in working towards these plans. I want to make sure that everyone at CNSC and at BWXT know that settlers like me want my treaty obligations honoured and upheld.

I want to say thank you for this opportunity to share my point of view. I am not a scientist, I'm a mother, a teacher and a woman. I teach visual art and English and I live in a world of feelings, not the world of numbers.

I respect you all very much for being here as well and giving away time that you could have had with your families.

I have a privilege in speaking my mind here. I don't belong here. I come from different places, South Africa, New Zealand, Canada and Scotland. It's a privilege to speak at this hearing.

My aim in speaking here isn't just because

I'm not going to miss an opportunity to speak my mind, but my husband might tell you that's why I'm here. I think it is a duty and responsibility as a mother, teacher and woman to be here; this is the way that I show my love.

I humbly request some compassion and respect between all the parties involved here. My kids are home with strep throat. I made dinner today, I dried some tears that weren't mine, I walked a picket line today. And my husband isn't sure there a point of me being here at all; I had a fight with him about it -- being here. And he's maybe right, it's not the first time. I think I can hold a unique perspective being here, however, and I would love to share it.

I think we need to find some common ground first and I think it needs to be in the love for all of our children. I would like to review just a few pages from this story by Danielle Daniel. It's called "Sometimes I Feel like a Fox". I am a teacher and though I don't work with little kids, I use books all the time.

This book is dedicated to her child and the thousands of Métis and aboriginal children who never grew up knowing their animal Totem(ph). It says:

"Sometimes I feel like a butterfly,

delicate and free. I spread my wings wide open and I flutter from flower to leaf. Sometimes I feel like a moose, awkward, ungraceful, and I move swiftly and silently with gentle strength and wisdom. And sometimes I feel like an owl, intuitive and discreet. I fly across the dark sky at night watching and listening. And sometimes I feel like a rabbit, quick and alert, eating carrots and leaping into new adventures. Sometimes I feel like a turtle, slow and quiet, retreating into my shell, finding peace and solitude. And sometimes I feel like a wolf, intelligent and loyal, surrounding myself with family, howling to the moonlight."

This is my attempt to remind us of where we have all been and where we are going. Our kids are just learning who they are. I don't want the kids at the neighbouring schools wondering about their future. I don't want their parents wondering about their future. I heard

you just now say this is a place for facts and I am urging you to consider feelings here as well.

The friend who loaned me this book is a beaver for sure. We laughed a lot about that today. She says I'm a bit like the wolf and she told me so. She says I'm trying to be intelligent, I'm a loyal person and this presentation is my howl for my kids, neighbours and the people I love.

They're kids I don't know or work with and the soil, the air and the water at the site all around for our neighbours, this book is dedicated to her child and I really think that that's what we need to be thinking about here, is the children of all the people who live nearby, the ones to the east and the ones all around, the ones who will be 170 metres away at Prince of Wales School.

I wrote the intervention against this licence for pelleting because my friends and I are scared about the unknown health impacts of beryllium, uranium and hydrogen stored onsite, especially the health impacts on children and the dangers in storing and transporting these to and from the location at BWXT.

We are especially alarmed about the idea of radioactive airborne soil and water contaminants so

close to Prince of Wales Public School and to the school my children will both be attending in the fall, Rowan Tree Nature Kindergarten at the community centre at the Mount. The Nature Kindergarten is home to about 30 or 40 students a day and it is 1500 metres from BWXT.

My youngest child currently attends this school because rain or shine the kids are 70 percent of their day outside. They make snowballs. They make forts in the forest in Jackson Park. They slide like otters down hills, I have seen the videos, and they balance on logs. They pretend they are animals all day long.

I'm asking you if you remember those days. Did you put your hands in that soil and come home filthy and happy, because I did, and that is a right that I believe all children should have.

I hope there is one thing we can all agree on here and that is that kids need to play in the dirt and we adults have a duty and right to keep them out of harm's way, no matter how small the harm, no matter how small the increase.

To the people at CNSC and the people at BWXT, I realize it's unreasonable to say not in my backyard, but truly, who will accept any increase of any

radioactive compound in their backyard at any time given the choice, no matter how many numbers are presented and in which ways? Numbers can all be presented with bias.

Would you feel good knowing that your kid might be eating snow next door if you were working at BWXT, because all kids eat snow. Even if I ask them not to, mine do. They will eat the dirt. They come home with dirty fingernails and they know they have had a good day. That's what kids do and I can tell you that because I'm a teacher and I am a mom and I have two little boys.

BWXT, your tagline is people strong, innovation-driven, and I can get behind that. That is almost like my motto of my life. To innovate means to make new and renew or change. Are you able to even change directions here? Is that something we can do at this point? We are so far along, can we change directions? Can we make new? Can scientists think that feelings are important and can a teacher like me understand the facts you are presenting? What about BWXT, could you make a change?

Think about and ask, is there another uranium pelleting processing plant in such proximity to a school in a residential area where children literally live

and spend hours of their day? They will be eating the soil and drinking up the snow and licking off the plants, that is what little kids do. Is there another facility so close?

Please do all you can to answer any questions people have to help their mental health and please do everything you can to make the soil and air safe, and the water too, should you be given this licence.

I really appreciate you listening. Thank you so much.

THE PRESIDENT: Thank you, Ms Vandenberg, for your submission.

Dr. Demeter...?

MEMBER DEMETER: Well, thank you very much for your sharing that. I appreciate your courage and your story.

I don't have any specific questions for you, but I want to emphasize to you that one of the results of your intervention is to further heighten my awareness -- our awareness of our responsibility to make decisions to keep you safe and secure and the whole community. That is the message I am going to take.

MS VANDENBERG: Thank you.

THE PRESIDENT: Dr. Berube...?

MEMBER BERUBE: I just want to say I empathize with having an emotional stake in all of this. I am an emotional person myself and I often find myself having to balance these things, the facts with how I feel, and that's a very difficult place to be because feelings are very powerful, they are very intense, they are not particularly logical, and then all this other side of this thing is, okay, facts, figures, this is the way it is, there's not a lot of variance because, as you know and I know, nature is pretty unforgiving at times.

So coming to us with your emotions, your sense of things, well, we have to thank you for that. That is what this forum is all about, to have an opportunity to hear how you are feeling and how you are thinking about these things.

I don't have any specific questions for you, but I just wanted to assure you that we have empathy and we have compassion for what you are saying to us.

MS VANDENBERG: Thank you for sharing that with me. I really hope that empathy counts for something in your decision-making. Thank you.

THE PRESIDENT: Dr. Lacroix...?

MEMBER LACROIX: Thank you for your intervention, I appreciate it.

THE PRESIDENT: Thank you that the wolf in you brought you here today. I very much appreciate that. Thank you.

Is there anything you want to add?

MS VANDENBERG: Just that kids need to play in dirt and they will, they are going to keep doing that. They should. They should come home dirty, happy, healthy. And I hope you all have a good night and get home to your family safely.

THE PRESIDENT: Thank you.

--- Pause

THE PRESIDENT: The next presentation is by Ms Lainey Bates, as outlined in CMD 20-H2.58.

Ms Bates, over to you.

CMD 20-H2.58

Oral presentation by Lainey Bates

MS BATES: Thank you.

Good evening. My name is Lainey Bates and I am a resident of the neighbourhood where BWXT is. I am

also a parent of two boys who attend Prince of Wales Elementary School and I am an employee of the Kawartha Pine Ridge District School Board, who often works at Prince of Wales.

I am also not a scientist or an energy worker and I have nothing to gain from the operations at BWXT. However, I do feel like I am being asked to take on risk.

Members of the tribunal, I have read your bios and and I have to say you are very impressive people. You have an incredible breadth of knowledge and experience on these issues and I am here to try and poke holes in arguments on things that I have never studied and it seems absolutely ludicrous.

We should just trust the people who know about this stuff to make decisions, but that kind of gets to the heart of the problem here. History has taught us that we need to look out for ourselves and that those who are entrusted with our protection sometimes are compromised or wrong or they simply don't have the right kind of information to make good decisions and nonetheless decisions get made.

Some have spoken about the concept of

social licence and how it's necessary for a project to proceed. Others talk about how sometimes it's used as a weapon against legitimate organizations who are provoked by an overemotional or underinformed radical minority and I truly hope that you don't think that's -- I hope that's not your impression of us.

I do have some major concerns about the operations at BWXT.

First, the unsuitability of the former GE location needs to be considered. The fact that it has been an industrial site since 1892 does not make it an appropriate site for industrial operations almost 130 years later. Science has progressed and we know much more about the impacts on human health and the environment. Industry and government need to pace with this and not continue to grandfather in business interests.

As has been said in other interventions, it seems impossible that you would find a school right next door to a nuclear facility of this type.

On the subject of spills and accidents, I am happy to hear that BWXT has done so much work to develop an Emergency Response Plan, but there remains the fact that Emergency Response Plans must include communication with

the school.

As I mentioned, I am an employee and parent of children who attend the school and I have never heard of this. I have received absolutely no communication about what the risks or the dangers might be or what we need to do about it. It's simply not good enough to have no plan for the school.

How is it okay that my kids know what to do if there is a shooter in the school but not if there is an explosion or a spill in the plant next door? To my knowledge, there has never been a school shooting in our Board and yet we practise these drills every year. Why do we need to wait for an explosion for someone to consider this and develop a plan? Or even better still, why take the risk?

That brings me to concerns about emissions. There has been a lot of talk about the different environmental controls and the air filters and safe levels. However, if all of these things fail, there is no safe distance to allow for error here, and there is no getting around that.

When I read the CNSC staff responses to our written interventions, there were some quotes that

jumped out at me that I would like to address.

The first one is from page 15:

"Beryllium is only a concern for the worker, not for the public or children."

To respond to that statement I am drawing from a toxicological profile for beryllium that came from the U.S. Department of Health and Human Services. Here is a quote from that:

"As a member of the general public, you may be exposed to higher than normal levels of beryllium if you live near an industry that processes or uses beryllium."

I think that is pretty clear.

More quotes:

"Beryllium is a metal that can be harmful when you breathe it in. The effects depend on how much and how long you are exposed to it."

It goes on then to describe what that is:

"This condition is called chronic beryllium disease. This disease can

occur long after exposure (10-15 years) to small amounts of either soluble or insoluble forms of beryllium.

...

Both the short-term, pneumonia-like disease and the chronic beryllium disease can be fatal."

So we know that beryllium is dangerous, but -- and here is another quote -- how can beryllium affect children?

This report says:

"It is likely that health effects seen in children exposed to beryllium will be similar to the effects seen in adults. Chronic beryllium disease was found in a child living near a beryllium factory."

We do not know whether children differ from adults in their susceptibility to beryllium; we do not know if exposure to beryllium will result in birth defects or other developmental problems in people. It is likely that beryllium can be transferred from the mother to an

infant in breast milk and that it can cross the placenta.

So in other words, there are likely serious consequences for children who are exposed to beryllium. We just don't know how much it would take or how long it would take. We just don't know.

There are also cases of what is known as community-acquired CBD. One study described the case of a woman who in 2016 tested positively for beryllium sensitivity. She lived within a half-mile of a beryllium factory that had been inactive for 30 years. In that same area in 2008 there were eight cases of community-acquired chronic beryllium disease.

So all of this to me seems to indicate that beryllium is a concern whether you encounter it in the workplace or in the community.

The second quote that I would like to address is this one from page 16 from the CNSC supplemental submission:

"Overall, the available evidence does not support a conclusion that a causal association has been established between occupational exposure to beryllium and the risk of

cancer."

This line is a direct quote from the reference study and it surprised me as we know from multiple sources that beryllium is a carcinogen.

And I didn't have to go very far to find out more information about this, because on the very same webpage there was a list of associated articles and I found this one, "Risk of lung cancer associated with quantitative beryllium exposure metrics within an occupational cohort." And here is a quote from this one:

"This study provides evidence that lung cancer is a risk or a lung cancer risk is elevated at levels near the current U.S. Occupational Safety and Health Administration beryllium exposure limit of 2 micrograms per cubic metre, DWA, or daily weighted average for workers."

So in other words, even at safe exposure limits there is still a high risk of cancer.

But perhaps the most pertinent statement about whether or not beryllium causes cancer comes from BWXT itself. In the presentation notes that were submitted

for this meeting they have listed the known health concerns of beryllium, which is known to be carcinogenic.

I do want to share a little bit from a 2008 article called "Beryllium's public relations problem: Protecting workers when there is no safe exposure level". This is a case study that presents a history of the knowledge in public policy concerning the prevention of beryllium-related diseases, focusing primarily on the role of the U.S. beryllium industry in shaping the policies of the regulatory system:

"The primary lessons of this case are not new, but bear repeating because they are too often forgotten or ignored.

The first is that the absence of evidence is not evidence of absence. There were indications before the advent of the beryllium LPT test that the 2 microgram per cubic metre exposure limit was not fully protective. With the diagnosis of CBD and beryllium sensitivity in an increasing number of workers with low

exposure, this conclusion became more difficult to avoid. As this evidence accumulated, the beryllium industry had a strong financial incentive to challenge the data and to oppose regulatory action that would result in a lower exposure limit. It appears this incentive shaped the interpretation given to scientific evidence by scientists employed by the beryllium industry.

This then is the second lesson of the case study. The interpretation of scientific data by those with financial incentives must be discounted. Scientists employed by the beryllium industry defended the standard long after it was correctly recognized as inadequate by independent scientists. In particular, work by scientists employed by firms specializing in product defence litigation support

must be seen for what it is, advocacy rather than science." (As read)

In conclusion, according to the CNSC staff responses, beryllium is only a concern for the worker and not for the public and children, and overall, the available evidence does not support a conclusion that a causal association has been established between occupational exposure to beryllium and the risk of cancer, and I am not satisfied that either of those two statements are true.

I ask that the request submitted by BWXT to renew its licence be denied for the reason that this type of industry, with its inherent risks and history of accidents and illness, cannot guarantee the safety of my family and my community, nor has the company made sufficient effort to attempt proper emergency preparedness education for those who live and work nearby.

That's all I have for today. Thank you very much.

THE PRESIDENT: Thank you, Ms Bates.

Dr. Berube...?

Dr. Lacroix...?

Dr. McKinnon...?

MEMBER MCKINNON: Yes, I have a question

in connection with the points you made in your written portion and it's with regards to floods and spills.

There was mention -- I'm going to address my question to the company. You mentioned that there are some berms around the plant. Is that the only surface water management you have or could you just describe what facilities you have in place? And, as part of that, what level of storm could you manage? Would it be like a 100-year storm or could you quantify that, please?

MR. SNOPEK: Dave Snopek, for the record.

The berm we have is around the area where we handle pellets as they come from Toronto and where we insert them into the fuel element tubes and seal the tubes. So it's the area where there is a potential for -- although pellets are solid, there is a potential for surface contamination with uranium.

We have a very robust cleaning program to make sure that the levels on floors and surfaces are very low and we have an industrial hygiene swiping that goes behind the cleaning staff to ensure that the cleaning is effective, but nonetheless, there is potential that there is surface contamination in that area.

So we have constructed, as you mentioned,

a berm around that area. The intent of the berm is to -- one in the intents of the berm is to exclude floodwater originating from outside the facility from running through that area.

We mentioned yesterday I believe that in 2004 there was a really massive rain event in Peterborough. I looked up some of the numbers since we spoke yesterday. The 100-year storm criteria is 100 millimetres of rain in 24 hours. So that would be expected to happen about once every 100 years.

The event that we had in 2004 was over 200 millimetres of rain in 24 hours, so significantly larger than the 100-year return period. In that event we had about a quarter inch of water that ran down the centre aisle of the facility. So we didn't get flooding in the sense that we had accumulation of water in the building, but water did run through the building.

So the berm that has been constructed is several times that height, it's about three or four inches, I forget the number, but certainly adequate to keep out water at the level of even that 2004 event and even higher, because that only amounted to about a quarter inch of water.

I will mention as well that, yes, we have created the berm. The City of Peterborough has taken a number of actions as well to improve the ability of the system to be able to accept large rain events like that, to better manage the stormwater should events like that happen again. So we have made improvements and I think the city has made improvements as well.

MEMBER MCKINNON: Okay. So the system is really designed to keep water out rather than retain what might flow into it?

MR. SNOPEK: Dave Snopek.

It's actually designed to do both. So one purpose is to exclude surface water running through the building from entering that area. The second purpose is to contain floodwater originating within the area. So that might be an overhead pipe burst, it might be a sprinkler head activation. We want to contain in that case water within the area so that we can sample the water and then treat it if necessary to dispose of it.

MEMBER MCKINNON: Okay. Thank you.

The reason I was asking whether it's to keep water out or in is because we are not familiar with the configuration of the site.

One of the other issues, if it was, you know, a lot of water from outside accumulating in, you know, I was going to ask whether that could become a potential groundwater transport mechanism, but it sounds like that area is an impermeable area. Is that correct?

MR. SNOPEK: Dave Snopek.

That's correct. It's an epoxy floor that is bermed and coved.

MEMBER MCKINNON: Okay. Thank you.

THE PRESIDENT: Dr. Demeter...?

MEMBER DEMETER: Thank you for your presentation.

It's sort of a recurring theme, but it has been brought up by a number of intervenors and I want to see if staff has anything to add.

I understand the Canadian Council of Ministers of Environment levels for soil, what's safe and what the guideline is. Are there any specific studies on the human health effects of beryllium in soil in children? That has been brought up a number of times and knowing the levels, where they're at, but are there any particular studies that look specifically at children?

MR. RINKER: Mike Rinker, for the record.

So the studies that we have been able to find have been on workers, they haven't been on children, but the guidelines and the criterion, provincial and federal, would include models that would take into account different dietary, respiration, soil ingestion, that would use the results of those studies to look at the impacts on children, but not studies specifically on children.

MEMBER DEMETER: Okay. Thank you.

THE PRESIDENT: Ms Bates, any final word from you?

MS BATES: I would like to conclude by saying that since I submitted my written submission or my written intervention we did learn more about those rising beryllium levels in the soil and I would just like to clarify that it's not necessarily the beryllium levels in the soil, it's just where is the beryllium coming from. Is it from particulate matter that is in the air and then falling down in precipitation? I think we really, really need to know exactly where it's coming from, because if that's beryllium in the air that is being inhaled, then that is a significant concern.

And I know you have heard the numbers about those soil samples already probably dozens of times

and we know that BWXT has said that their system is operating as designed and therefore BWXT couldn't be the source of those emissions, but right now we are at a place where we just don't know where it's coming from.

The CNSC response proposes that the ranges of measured concentrations likely reflect short-term variations that are within the background range and cannot be used to characterize long-term trends. However, these are levels that have been steadily increasing over a period of five years. So my question is, how long term does the data need to be?

Let us please remember that the absence of evidence is not evidence of absence.

What other possible explanations for the beryllium in the soil could be, we are not there yet, we don't know.

In the absence of evidence we need to take the position that the beryllium is coming from somewhere and that it is reaching an environment where human children are living and playing and breathing, and in order to be truly protective of human health we need to put human health first above all else.

I think one of the saddest casualties of

modern life in 2020 is the erosion of trust. The Canadian public has reason to be sceptical of the government and businesses who claim to put people first. You don't have to go far to find examples of betrayal in the town of widows.

In a system that processes business first, industry first and then, if there is insurmountable evidence of danger over a period of decades, then maybe you'll be heard.

And at the risk of sounding like an overemotional radical, I do ask the Members of the tribunal to consider what burden of proof is needed before it's worthwhile to put humans first, to put children first.

Please do not grant this licence. We just don't know everything that we need to know. Thank you very much.

THE PRESIDENT: Thank you for your intervention.

The next presentation is by Ms Jane Scott, as outlined in CMD 20-H2.246.

Ms Scott, over to you.

CMD 20-H2.246

Oral presentation by Jane Scott

MS SCOTT: My name is Jane Scott.

We are already exposed to the ongoing problem of legacy waste from GE and toxic emissions of beryllium, uranium dioxide and other contaminants from operations at BWXT. Why would we allow any increase to any exposure to any pollutant, let alone a radioactive heavy metal in the heavily populated downtown core, with a school and our most vulnerable citizens right next door?

We do know that the effects of all sorts of pollution are cumulative throughout people's lifetimes and that there are synergies between contaminants that we may not even yet be aware of. We must take a precautionary approach.

The IAEA. Children's radiation exposure should be kept as low as possible because they are more sensitive to radiation than adults and they have a longer life ahead of them.

It is impossible to contain all that fine radioactive powder, despite all the best efforts and best intentions. Extreme weather happens and people make

mistakes. Safe doses can quickly go through the roof.

Building 21 is butt up against the corner of the GE lands nearest to the school. There is a beryllium stack right next to the sidewalk where pregnant mothers walk by with toddlers in prams.

How many more uranium stacks will there be if your pelleting comes to town? Is this the true sense of ALARA?

In 2016 the air concentration of uranium at the perimeter of the factory in Toronto was tested at 390 times background levels. In 2018 the Toronto plant released over 3000 times more uranium into the air and 94,000 times more uranium into the water than the Peterborough plant did.

This is a substantial change. If pelleting comes to Peterborough, there will be a higher chance of people inhaling this dangerous ceramicized insoluble uranium dioxide powder deep into their lungs, where it would continuously irradiate their DNA and sensitive tissue from within for possibly long periods of time.

It is a false comparison to compare that type of ongoing internal radiation dose to a lung at a

cellular level to the relatively brief exposures of external radiation exposures such as X-rays and air travel. It's like comparing apples to oranges.

The CNSC promises us that it takes the science behind radiation protection very seriously. Let's take a closer look at that. We look to the CNSC to keep us safe.

First, the scientific consensus now is that there is no safe dose of radiation, period. The National Academy of Science.

Also, a very basic reminder on radiation effects from the U.S. National Regulatory Commission in a document called "Internal Dosimetry for Uranium":

"Stochastic effect: effect whose severity is NOT dependent on the dose received, but the probability of occurrence does depend on the dose. It is assumed that there is no threshold: the probability of occurrence drops to zero only at zero dose. Examples are cancer and genetic effects."

The other type is deterministic effects.

As we heard this morning, the CNSC, like many regulators in other countries, relies on the International Committee on Radiological Protection for their guidelines on how to protect people from radiation exposure. The ICRP's most recent comprehensive report came out in 2007.

What is very worrying is that in 2009, shortly after he resigned, Jack Valentin, former Scientific Secretary and Editor of the ICRP is on video admitting that the uncertainties for certain internal exposures were too high, up to two orders of magnitude, to properly predict the health effects on human populations. He also said it was wrong for the ICRP and UNSCEAR to ignore Chernobyl and other data when coming up with their risk assessment.

Predicting radiation doses is not an exact science. It's based on all sorts of models and assumptions that change through time as more information comes to light or is accepted into the mainstream and adopted by different governments.

Keith Baverstock, lead radiation expert for the Radiation Protection Program at the WHO European Office from 1991 to 2003 eventually lost his job for whistleblowing. He complained even then, in 2005, that the

ICRP and the IAEA underplayed the possible dangers of depleted uranium dust in war zones and other biological and epidemiological evidence, indicating that uranium is far more dangerous than previously thought, and I quote:

"There will be a period ranging perhaps from months to years where a slowly dissolving particle in the deep lung is surrounded by cells containing uranyl ions. Periodically these will let off an alpha particle and thus there is the possibility of a synergistic effect between a chemical carcinogen and radiation."

(As read)

He notes the importance of the bystander effect, where cells not actually irradiated but located close to ones that are exhibit radiation effects. He notes that the uranyl atom binds avidly to DNA and he notes that the ICRP routinely uses essentially untested models to determine the risks from internal emitters.

"We cannot therefore ignore the possibility that the IAEA, the ICRP and that the WHO are responding to

political pressure not to disclose the potential health consequences to either military or civilians in the use of depleted uranium [that's his quote] and thus natural uranium."

(As read)

BWXT and the CNSC imply that uranium is safe by calling it natural and weakly radioactive. However, there are many anomalies in the behaviour of uranium in vivo and in vitro that cannot be accounted for by conventional risk models. Uranium is a radioactive heavy metal.

Alexandra Miller, a radiobiologist from the American Armed Forces Radiological Research Institute has a mountain of biological evidence showing that there is a synergistic effect between uranium's radiotoxicity and its chemical toxicity as a heavy metal. Even cells that are not immediately hit by an alpha particle exhibit a bystander response and are damaged.

In "Climate and Capitalism," Miller points that:

"Recommended safe radiation limits promulgated by the UN agencies and

adopted by countries are not based on these new findings and thus do not protect against low dose radiation from DU and, by extension, natural uranium." (As read)

Massimo Zucchetti -- he was on the short list of candidates for the 2015 Nobel Prize in Physics:

"There is growing evidence in scientific literature, resulting both from in vitro and in vivo analysis, that current models of the mechanisms of toxicity of uranium dust are not fully satisfactory. They should be refined in order to obtain more effective responses and predictions regarding health effects. Emerging data on the different hazards of enriched uranium and depleted uranium indicate that the radiological toxicity cannot be neglected: a synergy between the chemical and radiological toxicity must be taken into account in the new model."

Ian Fairlie, radiobiologist, at a recent OPG public hearing, 2018, warns that there is a paradigm shift happening in radiobiology that has not been taken into consideration when coming up with risk assessments by the ICRP, BEIR and until recently, UNSCEAR, despite these findings not really being new at all. These untargeted effects, because they don't rely on direct breaks of DNA, include genomic instability where effects occur many generations later and bystander effects where adjacent cells not hit by radiation are damaged, and micro-satellite mutations.

He warns that these effects occur at very low doses of radiation. In fact, some effects occur after the passage of a single alpha particle through a cell. He adds that most scientists now think that genomic instability is a precursor to cancer. When faced with the uncertainties posed by non-targeted effects, it would be wise to apply the precautionary principle.

Hopefully, Peterborough won't be saddled with pelleting based on outdated science.

The CNSC knows that the inhalation of uranium dioxide is not relatively safe.

Some thoughts from UNSCEAR and the ICRP in

2016:

"There is no reason to consider that the alpha particles from uranium will have different relative effectiveness from alpha particles of similar energy emitted by other radionuclides, including Radon-222 and Plutonium-239." (As read)

And:

"Uranium worker data have often been limited to studies of male Caucasians. Quantitative generalizations to women and other population groups is therefore uncertain. No occupational studies have attempted to examine genetic, epigenetic or metabolic susceptibility factors for uranium-related diseases. Worker studies also provide no information about children who may be more susceptible to the effects of uranium exposure than adults." (As read)

And from the ICRP Draft Report on Cancer Risk From Exposure to Plutonium and Uranium, February 27, 2020:

"In addition to the chemical toxicity of uranium, all uranium isotope particles on radioactive decay which are classified as carcinogenic to humans by the International Agency for Research on Cancer, inhalation is the principal means of intake of uranium in the uranium fuel cycle and the chemical form of intake is important in determining the organ tissues specific doses received, in particular by the lung, insoluble forms of uranium residing for a longer time in the lung and giving a higher cumulative dose. Incorporated longlived radionuclides such as isotopes of uranium and plutonium, which can be tenaciously retained in the body, may continue to irradiate tissue for many years after intake.

A large uncertainty is usually associated with estimated internal doses following inhalation. The reliability of estimated intakes and doses depends notably on quality of measurements. Generally, these factors are not well known and estimates of internal doses are subject to substantial uncertainties. The information from current epidemiological studies of uranium exposure is insufficient to reliably quantify dose-response relationships. More studies are needed before any estimate of risk and detriment can be envisaged." (As read)

From the WHO's IRAC:

"Because cancer is thought to originate from a single cell, i.e. monoclonal, that has completed the process of a malignant transformation, it is unlikely a threshold exists for alpha

particle-induced lung cancer."

(As read)

In a peer-reviewed study, "Genetic Radiation Risks: a neglected topic in the low dose debate", Chris Busby, Inge Schmitz-Feuerhake (professor of experimental physics and researcher into the biological effects of ionizing radiation), and Sebastian Pflugbeil (medical physicist) note:

"Internal exposure to uranium by inhalation ... has been associated with significantly high genotoxicity resulting in anomalously high excess levels of chromosome damage and birth defects in a number of different groups... For internal exposure to substances like Sr-90 and uranium, which both have high affinity for DNA, the concept of dose is meaningless."

Chris Busby at the European Committee on Radiation Risk, PhD in Chemical Physics, explains it like this:

"The existing radiation risk model is

that of the International Commission on Radiological Protection, ICRP. It is the basis for all legislation in the area of radiation risk. For internal radioactive exposures it is seriously flawed. This is because: The units, absorbed dose, energy per unit mass are unable to adequately represent the key risk which is ionization density at the cell level. Thus absorbed dose does not distinguish between warming oneself in front of a fire and eating a hot coal."

Why does the CNSC state that uranium is not a carcinogen? IRAC states that inhaled, ingested uranium is a Type 1 carcinogen. The American Conference of Governmental Hygienists calls it a Group A1 confirmed human carcinogen.

Someone from the CNSC said that they followed the ICRP's 2008 guidelines that there are no observable effects under 100 mSv. Patrick Smeesters, a radiobiologist who is part of UNSCEAR, Euratom and a

Belgian radiological regulator asks:

"Why does the 100 mSv myth survive?"

You would do well to ask yourselves that question and Google it, because I have no time.

You have a choice here to choose between the well-being of people, especially of children, over the convenience of the company.

Thanks for your time.

THE PRESIDENT: Thank you for your submission, Ms Scott.

Dr. Lacroix...?

MEMBER LACROIX: Thank you, Madam Scott, for your intervention.

You mention in your written submission that Canada should update its Radiological Protection Guidelines to incorporate new scientific knowledge. I was wondering, how often are those guidelines updated in Canada?

MS TADROS: Haidy Tadros, for the record.

I believe our specialists in radiation protection are still in Ottawa. If they can please take that question.

MS PURVIS: It's Caroline Purvis. I am

the Director of the Radiation Protection Division, for the record.

The *Radiation Protection Regulations* have been recently undergoing a revision. The last time that they were updated was essentially for miscellaneous amendments. So they were enacted in 2000. The dose limits haven't been changed since that time. However, we are in the process of updating some dose limits with respect to the lens of the eye to align with more recent information about the potential effects of radiation. So the lens of the eye dose limit we are proposing to reduce to reflect that new scientific information.

Otherwise, there are no other proposed changes to the effective and equivalent dose limits for the skin and the extremities.

THE PRESIDENT: Dr. McKinnon...?

MEMBER MCKINNON: Yes. Thank you.

You raised some new points. I hadn't heard of the effects of synergy before. So I would like to ask staff: Is there any evidence for -- or what evidence might there be for the radiological chemical synergies of uranium I suppose would be the element here? Do they combine negatively or -- and while we are talking about

synergistic effects, could there be compounding effects of multiple contaminants such as beryllium and uranium? Would there be a larger effect in combination than just addition of the single channels by themselves?

MS TADROS: Haidy Tadros, for the record.

We will definitely get the answer. We have our radiation biologist coming tomorrow, but if after that there is more detail, we can provide something to the Commission.

THE PRESIDENT: Dr. Demeter...?

MEMBER DEMETER: Thank you for your intervention. I have no further questions.

THE PRESIDENT: Okay. Ms Scott, any final words?

Oh, Dr. Berube, did you have any questions? I'm sorry.

MEMBER BERUBE: Yes. Thanks for your submission. You spent a lot of time on that and we appreciate your efforts. That is the kind of feedback we are looking for. It helps us in many ways, just to keep us honest, if nothing else. So thank you for taking the time to do that. I'm sure you spent hours and hours.

I am reading your written submission and,

you know, one of the simplest questions you have on there is what do we do in the event of an emergency. Fortunately, we have the Fire Chief in the back and so I'm going to address these questions to him.

So, Chief, part of the application here from BWXT is actually to move their pelleting operations potentially from Toronto to here and so that comes with some more risks and hazards which your department might be faced with, one of which is potentially a large hydrogen tank, right now I think it's 9000 litres or so.

CHIEF SNETSINGER: Gallons.

MEMBER BERUBE: Gallons. Well, that's bigger than, 9000 gallons. Can your department actually handle a hydrogen explosion from something of that size? Are they trained to do that?

CHIEF SNETSINGER: So Peterborough Fire Service is highly trained. We are a Hazardous Materials Technician Team. We are one of six in the province: Windsor, Toronto, Ottawa, Thunder Bay, North Bay and ourselves. We are very highly trained. We can only react to an explosion. We do have very large water mains, we have advanced pumpers, we have foam onsite. In a highly populated area, you know, it fits into our risk assessment

as high and we have highly trained firefighters, minimum staffing of 15, three pumpers and an aerial, a platoon chief vehicle 24 hours a day, with access to airport fire truck, crash tender; it would be all hands on deck.

It's obviously we look at our all-hazards approach and our community. And we also have to take into account that we have these vehicles coming down the 115. And when we even look at our neighbours to quick routes when a train does come through the community, we are always looking to see if there is any hazardous materials coming through our community, and we take it very seriously.

MEMBER BERUBE: The other thing we that we identified when we were in the Toronto hearings, we didn't bring it up here, but the most serious event for BWXT in Toronto is that of a fire in the main building that could actually result in issues with uranium dioxide actually in the air. And I'm just wondering if your folks can actually handle, you know, a fire in a potential radiological environment?

CHIEF SNETSINGER: The current BWXT facility, we are capable to entering it to respond to that.

It's important to keep our firefighters safe, and we have to give them the training, also being

that HAZMAT technician response team. Our firefighters have to go home to our families too. And fighting fires is our business. We're very good at it. And we're always looking, for any high-risk buildings, we look to the Fire Code for them to be sprinklered.

MEMBER BERUBE: I just wanted to be very clear that you're confident your people can handle either one of those situations.

CHIEF SNETSINGER: We are reviewed by Fire Marshall's Office and we do our community risk assessments and also the insurance companies, they also come in and rate our community. They rate our fire department. They look at our training. So we are being evaluated from an outside agency, including the Fire Marshall's Office. We meet all the standards.

THE PRESIDENT: Staff, a quick question for you. In the intervenor's written submission, there's some mention made of dose to the public from both the Toronto and Peterborough facility. It's on page 2. And there's a comparison to the Darlington Nuclear Power Plant public dose. But I don't think those numbers are consistent with the information you had provided. So -- or maybe I've got it wrong. For the Toronto facility, it's 17

microsieverts, and for Peterborough it's 10, compared to 0.7 for Darlington Nuclear Power Plant. Do those --

MS SAUVÉ: Kiza Sauvé, for the record.

So the highest dose from the Toronto facility was 17 microsieverts. And we can talk about that, why that one was higher than other years if you'd like. If pelleting comes to Peterborough, it's predicted to be 10. Right now it's zero.

And the intervenor is correct. The nuclear power plants in Canada have extremely low public doses and the 0.7 is correct, keeping in mind all of these are less or around one per cent of the public dose limit. So they're all negligible, essentially.

THE PRESIDENT: Okay, thank you for that.

Ms Scott, any final words from you?

MS SCOTT: Have to remember the fact that these are stochastic events, so it can just be one particle in a lung that starts all this bad stuff, one single alpha particle, according to the experts. So it's not the same as deterministic effects.

And also, I find it a little worrying that it's okay to have a high-risk industry right next to a school, like with a hydrogen tank. Because the fire

station could blow up and then what happens, you know? And did the kids get respirators? Like it just -- it makes no sense to me. I mean, surely we have to put the health of our community over the convenience of the company. You know? I expect humans to be better than that.

THE PRESIDENT: Okay. Thank you for your intervention.

This concludes the list of presentations for today. It's not over yet.

We're now going to proceed with some written interventions and Marc Leblanc will introduce the submissions and take us through them.

But maybe before we do that, Members, do you have any questions of the fire chief before they leave for the evening? No.

Thank you very much for joining us today.

MR. LEBLANC: Thank you, Madame la présidente. We're going to proceed with some of the written submissions. We're going to go based on the number of the CMD, and what I'm going to ask the Members is I'm going to name the intervenor and the CMD number and I'm going to look at you, and if you have any question, just give me a sign.

We can right away recognize that many of the letters are similar or raise issues that have been discussed at length. So the focus will be on if new items or new issues have been raised.

CMD 20-H2.2

Written submission from Caroline Tennent

MR. LEBLANC: So I will start with the written submission from Caroline Tennent, CMD 20-H2.2.

CMD 20-H2.3

Written submission from Don and Heather Ross

MR. LEBLANC: The next submission is from Don and Heather Ross, CMD 20-H2.3.

CMD 20-H2.4

Written submission from Barbara Russell

MR. LEBLANC: The submission from Barbara Russell, CMD 20-H2.4

And if I'm going too fast, Members, just

stop me.

CMD 20-H2.5

Written submission from Layne and Gail Lewis

MR. LEBLANC: The next submission is from Layne and Gail Lewis, CMD 20-H2.5.

CMD 20-H2.6

Written submission from Devon Code

MR. LEBLANC: The next submission is from Devon Code, CMD 20-H2.6.

CMD 20-H2.8

Written submission from C. & T. Tool & Machine Inc.

MR. LEBLANC: The next submission is from C. & T. Tool & Machine Inc., CMD 20-H2.8.

CMD 20-H2.9

Written submission from Laurie Westaway

MR. LEBLANC: The next submission is from Laurie Westaway, CMD 20-H2.9.

CMD 20-H2.12

Written submission from Anne Elliott

MR. LEBLANC: The next submission is from Anne Elliott, CMD 20-H2.12.

CMD 20-H2.14

Written submission from Jennifer Kazda

MR. LEBLANC: The next submission is from Jennifer Kazda, CMD 20-H2.14.

CMD 20-H2.15

Written submission from Robert Paehlke

MR. LEBLANC: The next submission is from Robert Paehlke, CMD 20-H2.15.

CMD 20-H2.16

Written submission from Lisa Wood

MR. LEBLANC: The next submission is from Lisa Wood, CMD 20-H2.16.

CMD 20-H2.18

Written submission from Karin DesChamp

MR. LEBLANC: The next submission is from Karin DesChamp, CMD 20-H2.18.

CMD 20-H2.19

Written submission from Emily Straka

MR. LEBLANC: The next submission is from Emily Straka, CMD 20-H2.19.

Madame la présidente?

THE PRESIDENT: In this written submission, there's some concerns about the ancient facility, given that it's from the 19th century. And then it says:

"Studies have already determined a contaminated plume is spreading from the current site on Monaghan Road. Allowing the production of pelleting will further affect ..." (as read)

So what is this contaminated plume that's being referred to here? Maybe I'll ask BWXT.

MR. MacQUARRIE: It's John MacQuarrie, for the record.

My understanding is that's related to GE's operation. We don't have a lot of information about that. It doesn't relate to our part of the business or our part of the facility.

THE PRESIDENT: And I think that the folks from the Ontario Ministry of Environment made reference to it today. Okay ,thank you.

MR. LEBLANC: Thank you. Before I continue with the written, I just wanted to mention for those in the audience that the members still have some questions for Dr. Julian Aherne. And Dr. Aherne is to be back around 21:00 hours, so we will take a break in the written at one point when Dr. Aherne has returned. Thank you.

CMD 20-H2.24

Written submission from Helen Burnaby

MR. LEBLANC: So the next submission is from Helen Burnaby, CMD 20-H2.24.

CMD 20-H2.25

**Written submission from
Miriam Davidson and Marlowe Bork**

MR. LEBLANC: The next submission is from Miriam Davidson and Marlowe Bork, CMD 20-H2.25.

CMD 20-H2.28

Written submission from Gordon and Claudea Usher

MR. LEBLANC: The next submission is from Gordon and Claudea Usher, CMD 20-H2.28.

CMD 20-H2.30

Written submission from Sheila Collett

MR. LEBLANC: The next submission is from
Sheila Collett, CMD 20-H2.30.

CMD 20-H2.34

Written submission from Jennifer Guerin

MR. LEBLANC: The next submission is from
Jennifer Guerin, CMD 20-H2.34.

CMD 20-H2.37

Written submission from Philip McMichael

MR. LEBLANC: The next submission is from
Philip McMichael, CMD 20-H2.37.

CMD 20-H2.38

Written submission from Adam Baker

MR. LEBLANC: The next submission is from
Adam Baker, CMD 20-H2.38.

CMD 20-H2.39

Written submission from Ruth Pezzack

MR. LEBLANC: The next submission is from Ruth Pezzack, CMD 20-H2.39.

CMD 20-H2.41

Written submission from Leslie McGrath

MR. LEBLANC: The next submission is from Leslie McGrath, CMD 20-H2.41.

CMD 20-H2.43

Written submission from Timothy Holland

MR. LEBLANC: The next submission is from Timothy Holland, CMD 20-H2.43.

CMD 20-H2.44

Written submission from Anna Tennent-Riddell

MR. LEBLANC: The next submission is from

Anna Tennent-Riddell, CMD 20-H2.44.

CMD 20-H2.46

Written submission from Cynthia Conner

MR. LEBLANC: The next submission is from Cynthia Conner, CMD 20-H2.46.

CMD 20-H2.47

Written submission from Kathy Dunne

MR. LEBLANC: The next submission is from Kathy Dunne, CMD 20-H2.47.

Madame la présidente?

THE PRESIDENT: I think there have been some references made to an incident of a number of years ago, and this may have been before your time, where masks were provided or were not provided, and a number of workers got exposed. Was it to beryllium?

MR. SNOPEK: Dave Snopek, for the record. That is correct, it was to beryllium.

THE PRESIDENT: And could you just tell us a little bit more about that particular incident and what

kind of upticks those resulted in?

MR. SNOPEK: Dave Snopek.

Yes. So we described the facility a little bit earlier today, or perhaps it was yesterday, where we have a small what we call a B3 coating room. In that area it's a respirator-required area. Day-to-day operations personnel use a full-face respirator where the cartridges are attached directly to the respirator.

But there is a fairly infrequent maintenance operation occurs about once a quarter where there's a different respirator that's used. It's called a powered air purifying respirator, where the same type of full-face respirator is worn, but it's a powered unit that forces air to the respirator. And that's worn on the person's back. That's only used, like I said, about once a quarter, maybe twice a quarter, to do this maintenance operation.

It was discovered that the filters that were on that respirator pack on one of these packs were the incorrect type of filters. There are different types of filters for different types of hazards. Of course the hazard that we're concerned with in that room is particulate, and there's therefore a HEPA filter in the

intended type of cartridges. It was found that the cartridge was type that protected against vapour hazards as opposed to particulate hazards.

We did an investigation of that and it was determined that incorrect filters were originally provided for the equipment that was purchased. However, when there was a restocking of filters, the incorrect filters were supplied and used.

So we did a full investigation on this and we determined that there was 15 instances where maintenance personnel used those or potentially used those filters over the course of about -- I think it was about 15 months. So there was potential over-exposure or potential instances of people working in an environment where we were monitoring the air. So for this work task, personnel wear a lapel air sampler. So we have air data for that. And we believe that the air was over the occupational exposure limit on those instances.

So we launched a full investigation. We increased monitoring of those employees with our medical doctor and we increased the frequency of the beryllium lymphocyte proliferation test for those employees. There was two employees affected. We had a number of corrective

actions. We were before the Commission to provide a brief in 2017. And we've implemented those corrective actions.

CMD 20-H2.48

Written submission from Jacqueline Wright

MR. LEBLANC: The next submission is from Jacqueline Wright, CMD 20-H2.48.

CMD 20-H2.49

Written submission from Joshua Benjamin Marston

MR. LEBLANC: The next submission is from Joshua Benjamin Marston, CMD 20-H2.49.

CMD 20-H2.50

Written submission from Lara Elizabeth George

MR. LEBLANC: The next submission is from Lara Elizabeth George, CMD 20-H2.50.

Dr. Berube?

MEMBER BERUBE: So the intervenor here has some concern actually with the age of the building itself.

And I was wondering, BWXT, if you could tell me the last time the building was inspected for fitness for service.

MR. SNOPEK: Dave Snopek, for the record.

I'm not sure which building the intervenor's talking about. I'll assume it's building 21. Building 21 I believe was built in 1952. We have third-party reviews that we conduct annually that looks at Fire Code, Building Code. They come through. They produce a report. So we have a third-party contractor come through annually.

MEMBER BERUBE: And I guess because you just took it over the last two years, you probably had a similar inspection of the building before you did that?

MR. MacQUARRIE: It's John MacQuarrie, for the record.

So that's correct. When we made the acquisition in late 2016, we had a review of the facility. We also had our insurers come through and look at the facility and then look at some of the systems that Mr. Snopek just mentioned. So yes, that's correct.

MEMBER BERUBE: Were there any deficiencies? Did you have to spruce anything up?

MR. MacQUARRIE: No, there was nothing

that we found that was corrected at that time. We found it to be in good shape.

CMD 20-H2.52

Written submission from Gwen Stevens

MR. LEBLANC: The next submission is from Gwen Stevens, CMD 20-H2.52.

CMD 20-H2.53

Written submission from Mary Garvey

MR. LEBLANC: The next submission is from Mary Garvey, CMD 20-H2.53.

CMD 20-H2.54

Written submission from Sarah Thomson

MR. LEBLANC: The next submission is from Sarah Thomson, CMD 20-H2.54.

CMD 20-H2.59

Written submission from Jonathan Campbell

MR. LEBLANC: The next submission is from Jonathan Campbell, CMD 20-H2.59.

CMD 20-H2.60

Written submission from Anna Eidt

MR. LEBLANC: The next submission is from Anna Eidt, CMD 20-H2.60.

CMD 20-H2.62

Written submission from Karen Hjort-Jensen

MR. LEBLANC: The next submission is from Karen Hjort-Jensen, CMD 20-H2.62.

Madame la présidente?

THE PRESIDENT: Question to CNSC staff. There's a comment here that the acceptable level of radon gas exposure in Canada are twice those of the US and four times the acceptable level set by the WHO. Can staff comment on that?

MR. AMALRAJ: Julian Amalraj, for the record.

Is that for occupational exposure? I'm just clarifying --

THE PRESIDENT: I doubt it, because it talks about levels in the house.

MR. AMALRAJ: For occupational exposure, the facility's under the Canada Labour Code and the Occupational Health and Safety Regulations, which actually use the American Council of Governmental Industrial Hygienists requirements for the specified occupational exposure for all chemicals in general, so.

THE PRESIDENT: And do you know for public? Okay. For residences --

MS SAUVÉ: Kiza Sauvé, for the record.

So Health Canada sets the levels for radon in homes, and they do that based on international studies. And it is a possibility it's higher than in the States, but it is based on --

MR. JAMMAL: It's been updated.

MS SAUVÉ: It's been updated. So I'm getting information from behind, so I'll pass it back to Mr. Jammal.

MR. JAMMAL: It's Ramzi Jammal, for the record.

It's Health Canada's responsibility for the ambient radon in homes. Yes, correct, the Health Canada values were higher than -- slightly higher than international based on the new studies. The Health Canada did do a consultation and they proposed new values. I don't have the values in my head, but I can look it up on the website.

--- Off-record discussion / Discussion officieuse

MR. JAMMAL: It's 200 becquerels per cubic metre.

CMD 20-H2.64

Written submission from Drew Ginter

MR. LEBLANC: The next submission is from Drew Ginter, CMD 20-H2.64.

CMD 20-H2.69

Written submission from Barton Feilders

MR. LEBLANC: The next submission is from

Barton Feilders, CMD 20-H2.69.

CMD 20-H2.70

Written submission from Ursula Pflug

MR. LEBLANC: The next submission is from Ursula Pflug, CMD 20-H2.70.

CMD 20-H2.72

Written submission from Beverley Peever

MR. LEBLANC: The next submission is from Beverley Peever, CMD 20-H2.72.

CMD 20-H2.73

Written submission from Katrina Behr

MR. LEBLANC: The next submission is from Katrina Behr, CMD 20-H2.73.

Madame la présidente?

THE PRESIDENT: A question for BWXT, and I think a few intervenors have mentioned this. There is mention of someone who was taken to hospital for radiation

exposure.

"I spoke with a man whose teenage son frequently played in the woods near the Prince of Wales for years and has been admitted to the hospital for radiation exposure." (as read)

And then they talk about uranium released to the sewer.

And more than one intervenor has mentioned those two incidents.

MR. MacQUARRIE: It's John MacQuarrie, for the record.

We have no knowledge of anyone ever being taken to hospital or any release to the sewer beyond normal --

THE PRESIDENT: Right, and people in HAZMAT suits. Staff, do you know anything about those?

MS TADROS: Haidy Tadros, for the record. We don't have any information specific to those incidents.

MS SAUVÉ: Kiza Sauvé, for the record.

We have talked about the disposal to sewer is a batch release. So it is tested before every batch

goes out. So it wouldn't be released if it didn't meet their internal control limits. So that's what we know about the release to sewer.

MR. LEBLANC: Dr. Demeter?

MEMBER DEMETER: Yeah, there was one of the intervenors yesterday that talked about individuals appearing to do work on the sewer outside in hazmat suits, and I wonder -- you know, where I'm from they wear protective equipment as well for other risks such as methane and biohazards.

So I didn't get a chance to ask that question at that time, but that wouldn't be necessarily an unusual observation depending on the type of sewer and the work they're doing.

But you don't know of any radiologic hazard that would require people to do hazmat suit to do sewer work.

MR. MacQUARRIE: No, we don't.

MEMBER DEMETER: Okay.

CMD 20-H2.74

Written submission from Jessica Rowland

MR. LEBLANC: The next submission is from Jessica Rowland, CMD H2.74.

CMD 20-H2.76

Written submission from Mathew and Karlie Holtby

MR. LEBLANC: The next submission is from Mathew and Karlie Holtby, CMD 20-H2.76.

CMD 20-H2.77

Written submission from Janet Harris

MR. LEBLANC: The next submission is from Janet Harris, CMD 20-H2.77.

CMD 20-H2.83

Written submission from Stacy Smith Barriault

MR. LEBLANC: The next submission is from Stacy Smith Barriault, CMD 20-H2.83.

CMD 20-H2.84

Written submission from Erin Parker

MR. LEBLANC: The next submission is from Erin Parker, CMD 20-H2.84.

CMD 20-H2.86

Written submission from Carolyn Ross

MR. LEBLANC: The next submission is from Carolyn Ross, CMD 20-H2.86.

CMD 20-H2.88

Written submission from Andrew Griffin

MR. LEBLANC: The next submission is from Andrew Griffin, CMD 20-H2.88.

CMD 20-H2.90

Written submission from Stu Morris

MR. LEBLANC: The next submission is from

Stu Morris, CMD 20-H2.90.

CMD 20-H2.91

Written submission from Sharon Fitzgerald

MR. LEBLANC: The next submission is from Sharon Fitzgerald, CMD 20-H2.91.

CMD 20-H2.94

Written submission from

Ava Richardson and Zenryu Owatari

MR. LEBLANC: The next submission is from Ava Richardson and Zenryu Owatari, CMD 20-H2.94.

CMD 20-H2.95

Written submission from Leanne Simpson

MR. LEBLANC: The next submission is from Leanne Simpson, CMD 20-H2.95.

CMD 20-H2.96

Written submission from Peter Prinsen

MR. LEBLANC: The next submission is from Peter Prinsen, CMD 20-H2.96.

CMD 20-H2.97

Written submission from Jonothan Fiddler

MR. LEBLANC: The next submission is from Jonothan Fiddler, CMD 20-H2.97.

CMD 20-H2.98

Written submission from Claire Symington

MR. LEBLANC: The next submission is from Claire Symington, CMD 20-H2.98.

CMD 20-H2.100

Written submission from John Climenhage

MR. LEBLANC: The next submission is from John Climenhage, CMD 20-H2.100.

CMD 20-H2.102

Written submission from Michael Phillips

MR. LEBLANC: The next submission is from Michael Phillips, CMD 20-H2.102.

CMD 20-H2.103

Written submission from Cathy Manias-Fiddler

MR. LEBLANC: The next submission is from Cathy Manias-Fiddler, CMD 20-H2.103.

CMD 20-H2.106

Written submission from Chris Risley

MR. LEBLANC: The next submission is from Chris Risley, CMD 20-H2.106.

CMD 20-H2.107

Written submission from

Katherine Orgill and Bruce Scott

MR. LEBLANC: The next submission is from Katherine Orgill and Bruce Scott, CMD 20-H2.107.

CMD 20-H2.110

Written submission from Joanne O'Donoghue

MR. LEBLANC: The next submission is from Joanne O'Donoghue, CMD 20-H2.110.

CMD 20-H2.111

Written submission from Matt Snell

MR. LEBLANC: The next submission is from Matt Snell, CMD 20-H2.111.

CMD 20-H2.112

Written submission from Adrienne Newman

MR. LEBLANC: The next submission is from

Adrienne Newman, CMD 20-H2.112.

CMD 20-H2.113

Written submission from Charlotte Kennedy

MR. LEBLANC: The next submission is from Charlotte Kennedy, CMD 20-H2.113.

CMD 20-H2.115

Written submission from Roy Brady

MR. LEBLANC: The next submission is from Roy Brady, CMD 20-H2.115.

CMD 20-H2.123

Written submission from Ralf Pohlak

MR. LEBLANC: The next submission is from Ralf Pohlak, CMD 20-H2.123.

CMD 20-H2.126

Written submission from Susan Cooper

MR. LEBLANC: The next submission is from Susan Cooper, CMD 20-H2.126.

CMD 20-H2.127

Written submission from Rosemary MacAdam

MR. LEBLANC: The next submission is from Rosemary MacAdam, CMD 20-H2.127.

CMD 20-H2.128

Written submission from Rebecca Reeves

MR. LEBLANC: The next submission is from Rebecca Reeves, CMD 20-H2.128.

CMD 20-H2.129

Written submission from Danielle Tassie

MR. LEBLANC: The next submission is from Danielle Tassie, CMD 20-H2.129.

CMD 20-H2.130

Written submission from Miriam Lyall

MR. LEBLANC: The next submission is from Miriam Lyall, CMD 20-H2.130.

THE PRESIDENT: So we'll get back to our oral presentation now that Dr. Aherne's with us.

Again, our apologies for cutting you short yesterday.

So this is CMDs 20-H2.244 and 244A.

Did you just want to recap your recommendations, please?

CMD 20-H2.244/20-H2.244A

Oral presentation by Julian Aherne

DR. AHERNE: Yeah. I think yesterday I made -- I summarized three broad recommendations.

I think in general I would say that I'm fully supportive of the IEMP data, but feel that there could be more rigorous analysis and care with reporting of the data.

The second recommendation was that given the observed trend in the data -- so I prefer to call it "observed trend" rather than "apparent trend". It's an observation.

Given the observed trend in the soil data, that it would seem to be appropriate to pause the licence application and evaluate the environmental data.

And my last recommendation was that there should be environmental monitoring and that, in a broader sense, that all facilities -- broader sense outside of Peterborough, all facilities located in residential areas should have an environmental monitoring program, i.e. monitoring outside the fence line, irrespective of reported emissions.

THE PRESIDENT: Were you here this morning?

DR. AHERNE: No, unfortunately I wasn't here this morning and I wasn't --

THE PRESIDENT: You don't know what I was going to ask you.

So were you here when the Medical Officer of Health was here and when she made her recommendation on the environmental monitoring that she --

DR. AHERNE: No, I wasn't.

THE PRESIDENT: Okay. Well, maybe I'll get one of my colleagues to go over what her recommendation was and we'll get your input on that.

So I think we had stopped with you, had we not, Dr. McKinnon?

Well, why don't we start with you?

MEMBER MCKINNON: I don't think I have any further questions. We had quite a lot of discussion after you had -- well, this morning, I guess.

I'm not disputing your -- the points you make. I think it was very valid. I don't have any further questions.

THE PRESIDENT: Okay. Dr. Demeter.

MEMBER DEMETER: Thank you very much for your presentation yesterday. I think I really appreciate you quantified the results noting the stability issues in some of the data points.

I am excited about a couple things that are potential and I'll leave it to the licensee and CNSC how they proceed. One, I really like the link to an academic who this is their field, and that potentially brings some third party credibility and expertise to this

and thinking a bit more outside the box.

I also see this as a potential and perhaps as a more drilled-down, concentrated thing if you have Honour students or graduate students that this may -- a chunk of this would be a really nice piece of work to follow with. So I just -- I'm excited about those concepts. I think you add a lot of value to this, and I saw the evolution of the accelerated monitoring program and more attention being paid. And I just want to support that.

DR. AHERNE: I could just respond with a general comment and say, of course, given that the university's in the neighbourhood, there is interest from students to be engaged in some monitoring projects, but that should still be taken on the periphery.

I mean, I think there is a valid need for a more robust environmental monitoring program, and that needs to be given time to mature and, of course, there's always added benefit to have students engaged in that work as well.

THE PRESIDENT: So I'll go through what I wrote down of her recommendations and our transcripts will be more thorough and accurate.

She did recommend an environmental monitoring program regardless of whether pelleting comes or not and, you know, consistent with the CSA standard. Very strong on getting representatives of the community involved and accessibility to the information and the plan and so on.

She talks about sampling, active air monitoring, of a station at the school and some other ones, soil sampling, minimum of 25, sample annually, wastewater treatment plant.

And you're nodding at all those, so -- and she says it's not because she doesn't -- she does believe that BWXT's operating safely and that the emissions are well below any that would be of concern from a health perspective, but this was very much how do you build community trust and confidence that it's safe. And if you've got tangible, objective evidence like these results that they have actually been involved in designing, measuring and assessing that it would go a long ways.

So is that what your thinking was?

DR. AHERNE: Yes, in general I would agree with all of those recommendations.

I think the lack of an environmental

monitoring program at the moment brings up some uncertainty with respect to the results of the IEMP. The IEMP have nothing to validate against other than the stack emissions and so, therefore, there's a large question hanging, i.e. what is the cause of this observed trend in the soil data.

If there was a monitoring program in place, of course, then we might be able to resolve that issue.

So I think there does need to be a monitoring program and it needs some time to mature as well before a decision can be made. I think there's some questions with respect to the current licence because of that.

THE PRESIDENT: Dr. Berube, did you have any questions?

MEMBER BERUBE: I appreciate your work. The regression lines are highly suggestive. The data set is obviously very low and because the testing methodology is not uniform, suspect, of course. You and I both know this.

So the issue is yeah, of course, the only way to actually get truth on this is to increase the amount of testing that's done to get better data sets.

So that's pretty much all I have to add. I'd like to thank you for your work. It certainly does help clarify the situation.

DR. AHERNE: Yeah, and I might generally respond and say it is a limited data set and so, I mean, I really tried to push the analysis really to dig deep. There's very little to dig with. Cirque du Soleil joke.

But there was uranium data. We see this divergence within the two data sets, so irrespective if it was a sampling anomaly that it would be across both.

We have three times sampling, so it would increase the power a little bit.

And I mean, one thing to note, of course, is that we have a longer period between the first two periods of sampling. That's where we see the larger difference. And we have a shorter period between the next period, so we see a shorter, smaller difference.

And if you look at the two periods, the majority of the sites show an increasing trend.

And I mean, there's accumulation in the correlation with the wind direction. It's all so hard to ignore as well.

So some arguments are difficult to ignore,

I think.

THE PRESIDENT: Dr. Lacroix?

MEMBER LACROIX: I just want to thank you. We really value your contribution. Good work. Thank you.

THE PRESIDENT: Staff, did you have any comment, anything you wanted to add?

And then I'll ask BWXT.

MR. RINKER: Mike Rinker, for the record. So we do appreciate the work that was brought into this. And I think there's -- you know, there's two issues that are put forward, and one is the trend and one is the levels.

CNSC Staff are of the view that both matter, right, that the levels matter from a safety perspective and the trends matter based on the behaviour and the connection to the facility.

And so there's a lot of explanations that could account for the trends that need to be investigated. And so we're not denying that the facility has a link. It may have a link, it may not.

Right now, there's very detailed data that we've been looking at and inspecting and ensuring it's been validated through independent third party stack testing

that indicate the emissions are around 15 milligrams in a year. And so that can't explain a half a milligram per kilogram increase in soil in the neighbourhoods. It's just not enough mass.

So either we're missing several kilograms of emissions, which is very important, or there's another explanation for the increasing trend. And that needs to be investigated.

And I hope we can partner with as many people who want to be involved in the neighbourhood because without that understanding, there's an erosion in trust, there's an erosion in whether we're -- there's appropriate behaviour of the licensee and appropriate regulatory oversight.

But in terms of the levels, I think that's also important because what we've measured in the environment, it's a snapshot. It's not a rigorous environmental monitoring program whatsoever.

But the ambient air monitoring that we did is the same value you would expect if there wasn't a facility here, right. And the soils, while they're trending -- showing a trend with the work that we've seen in the wrong directions, we don't want to see this trend if

it's real.

But it's still within the same levels that you would see elsewhere in Ontario, and so the risk to the people, to the children in that school is based on the levels. Preventing future risk is the trends, right.

And we do not see a risk to the public based on the levels that are there now.

THE PRESIDENT: BWXT?

MR. MacQUARRIE: It's John MacQuarrie, for the record.

So we want to know if we're releasing anything into the environment that we don't think we are. We want to know what we're releasing. We want to know that we're not doing any harm. It's really important to us.

And we're certainly concerned by the IEMP results. They're puzzling and concerning to us, and so as I've said, we're committed to doing our own soil sampling.

As I said earlier, we need expertise and help to figure out what environmental monitoring program should look like and we need to -- I think just as importantly, we need to build trust and -- with our community and we need to get more confidence in us and we need to consult with that community about what we do in

terms of that environmental monitoring. So we're open to that.

I understand from my colleague that Dr. Aherne has applied to be a CLC member, and I think that's really excellent to have that kind of expertise and the connection to the academic body that he's -- he represents.

So we're thinking that's very good, and I'm sure there's others that will help us. And our intention is to move quickly on that and formulate a plan.

We've said that -- so that's beryllium.

We've said that, you know, we don't see how we could be releasing any uranium. I'm not saying that we won't do that. I think we need to consult with that group and explain what's going on and get their input and listen to them, and then we'll see what comes out of that.

THE PRESIDENT: Thank you very much.

And thank you. Do you have something to say?

DR. AHERNE: Yes, and I was told to come nearer.

I agree with everything that Mike said. There's issues with understanding where that mass may come from, if it's, you know, correct, so there's a lot of

uncertainties there.

I would still stress that soil is monitored as a way to evaluate changes in the atmospheric deposition part, so the levels are important within the soils, but they're secondary. I mean, the soil is monitored so we have that larger spatial capture with respect to changes, and those changes are atmospheric input.

So that's essentially what they should reflect. The question is now, where does that beryllium come from to drive those changes.

THE PRESIDENT: Thank you very much.
Thank you for coming back tonight for this.

DR. AHERNE: Thank you.

THE PRESIDENT: And back to you, Marc.

MR. LEBLANC: Thank you.

CMD 20-H2.131

Written submission from Timothy Wilson

MR. LEBLANC: The next submission is from Timothy Wilson, CMD 20-H2.131.

CMD 20-H2.135

Written submission from Stephanie Benn

MR. LEBLANC: The next submission is from Stephanie Benn, CMD 20-H2.135.

CMD 20-H2.136

Written submission from Ann Jaeger

MR. LEBLANC: The next submission is from Ann Jaeger, CMD 20-H2.136.

CMD 20-H2.141

Written submission from Robert Gibson

MR. LEBLANC: The next submission is from Robert Gibson, CMD H2.141.

CMD 20-H2.145

Written submission from Claudette Beaudoin

MR. LEBLANC: The next submission is from Claudette Beaudoin, CMD 20-H2.145.

CMD 20-H2.148

Written submission from Arndt Kruger

MR. LEBLANC: The next submission is from Arndt Kruger, CMD 20-H2.148.

CMD 20-H2.149

Written submission from John Marris

MR. LEBLANC: The next submission is from John Marris, CMD 20-H2.149.

CMD 20-H2.150

Written submission from Andrew Jobes and Sarah Crane

MR. LEBLANC: The next submission is from Andrew Jobes and Sarah Crane, CMD 20-H2.150.

CMD 20-H2.153

Written submission from Ken Brown

MR. LEBLANC: The next submission is from

Ken Brown, CMD 20-H2.152.

CMD 20-H2.153

Written submission from Anna Petry

MR. LEBLANC: The next submission is from Anna Petry, CMD 20-H2.153.

CMD 20-H2.155

Written submission from Robert Steinman

MR. LEBLANC: The next submission is from Robert Steinman, CMD 20-H2.155.

CMD 20-H2.156

Written submission from Sheila Nabigon-Howlett

MR. LEBLANC: The next submission is from Sheila Nabigon-Howlett, CMD 20-H2.156.

CMD 20-H2.158

Written submission from Rachel Wortis Beda

MR. LEBLANC: The next submission is from Rachel Wortis Beda, CMD 20-H2.158.

CMD 20-H2.161

Written submission from Anne White

MR. LEBLANC: The next submission is from Anne White, CMD 20-H2.161.

CMD 20-H2.162

Written submission from Pete Hewett

MR. LEBLANC: The next submission is from Pete Hewett, CMD 20-H2.163.

CMD 20-H2.163

Written submission from Kendra Couling

MR. LEBLANC: The next submission is from Kendra Couling, CMD 20-H2.163.

CMD 20-H2.172

Written submission from Lisa Campbell

MR. LEBLANC: The next submission is from Lisa Campbell, CMD 20-H2.172.

CMD 20-H2.179

Written submission from Colin Purcell

MR. LEBLANC: The next submission is from Colin Purcell, CMD 20-H2.179.

CMD 20-H2.182

Written submission from Corry Prinsen

MR. LEBLANC: The next submission is from Corry Prinsen, CMD 20-H2.18.

CMD 20-H2.183

Written submission from Caroline (Cara) Peterman

MR. LEBLANC: The next submission is from

Caroline or Cara Peterman, CMD 20-H2.183.

CMD 20-H2.185

Written submission from Steven do Vale

MR. LEBLANC: The next submission is from Steven do Vale, CMD 20-H2.185.

CMD 20-H2.188

Written submission from Janice Rosen

MR. LEBLANC: The next submission is from Janice Rosen, CMD 20-H2.188.

CMD 20-H2.190

Written submission from Jamie Flagg

MR. LEBLANC: The next submission is from Jamie Flagg, CMD 20-H2.190.

CMD 20-H2.194

Written submission from Barbara Chisholm

MR. LEBLANC: The next submission is from Barbara Chisholm, CMD 20-H2.194.

CMD 20-H2.197

**Written submission from
Trevor Middel and Stephanie Melles**

MR. LEBLANC: The next submission is from Trevor Middel and Stephanie Melles, CMD 20-H2.197.

CMD 20-H2.199

**Written submission from
Julian Aherne, Gary Burness, James Connolly,
Peter Lafleur, Erica Nol, Mark Parnis
and Rachel Wortis**

MR. LEBLANC: The next submission is from Julian Aherne, Gary Burness, James Connolly, Peter Lafleur, Erica Nol, Mark Parnis and Rachel Wortis, CMD 20-H2.199.

CMD 20-H2.202

Written submission from Thomas Miller

MR. LEBLANC: The next submission is from Thomas Miller, CMD 20-H2.202.

CMD 20-H2.204

Written submission from George Campana

MR. LEBLANC: The next submission is from George Campana, CMD 20-H2.204.

CMD 20-H2.209

Written submission from Mary Elizabeth Konrad

MR. LEBLANC: The next submission is from Mary Elizabeth Konrad, CMD 20-H2.209.

CMD 20-H2.212

Written submission from Juliette Barriault

MR. LEBLANC: The next submission is from Juliette Barriault, CMD 20-H2.212.

CMD 20-H2.213

Written submission from Everett Barriault

MR. LEBLANC: The next submission is from
Everett Barriault, CMD 20-H2.213.

CMD 20-H2.214

Written submission from Jennifer Bowe

MR. LEBLANC: The next submission is from
Jennifer Bowe, CMD 20-H2.214.

CMD 20-H2.217

**Written submission from
Gordon and Caroline Langill**

MR. LEBLANC: The next submission is from
Gordon and Caroline Langill, CMD 20-H2.217.

CMD 20-H2.218

Written submission from Bruce Harris

MR. LEBLANC: The next submission is from Bruce Harris, CMD 20-H2.218.

Dr. Demeter.

MEMBER DEMETER: Thank you.

There was -- I don't know what the source is. There was a quote from the intervenor:

"I have reviewed the report of the advisory committee on retrospective exposure profiling of the production processes at the General Electric production facility. It is disconcerting that the employees at the GE faculty, building 21, were found to have uranium in their urine that far exceeded the allowable concentration. It also noted that 44 percent of the workers in the GE nuclear department were found to have reduced white blood cells, monocytes." (as read)

And then it goes on.

I don't know what this refers to, what time span this refers to, but if someone could clarify. Maybe BWXT.

If it's dealing with uranium, then it's part of that previous GE industry that wasn't nuclear related, but someone could maybe help me with this.

MR. SNOPEK: Dave Snopek, for the record.

We've lost -- you've noticed Mr. Chambers is not behind me. He's prepared for this question. Unfortunately, he's not with us tomorrow, either. We were hoping this would come up before, so I will pinch hit the best that I can.

We've looked at this statement and this is in regards to a study that was done, I believe, on the Toronto population. And the short answer is we believe that the conclusions of that study were mischaracterized or misunderstood in the statement that you read.

MEMBER DEMETER: So does CNSC have any knowledge of this study from the Toronto site historically?

DR. DUCROS: Caroline Ducros, for the record.

No, this isn't one of the events that

we -- it wasn't reported to us and it's not something -- we would have caught it if it had happened.

MEMBER DEMETER: Okay. I saw the presence of uranium in urine was a red flag, so.

MR. SNOPEK: Oh, sorry. Dave Snopek, for the record.

I should mention that this is in relation to a historical event. This is not a recent event.

MEMBER DEMETER: I understood that. It was just an event of note, so I was curious.

Thank you.

CMD 20-H2.221

Written submission from Jillian Hansen

MR. LEBLANC: The next submission is from Jillian Hansen, CMD 20-H2.221.

CMD 20-H2.224

Written submission from Graeme Marrs

MR. LEBLANC: The next submission is from Graeme Marrs, CMD 20-H2.224.

CMD 20-H2.226

Written submission from Jennifer Kirkpatrick

MR. LEBLANC: The next submission is from Jennifer Kirkpatrick, CMD 20-H2.226.

CMD 20-H2.227

Written submission from Linda Patterson

MR. LEBLANC: The next submission is from Linda Patterson, CMD 20-H2.227.

Dr. Demeter.

MEMBER DEMETER: So the intervenor makes a really profound statement in her, "I have heard of a child treated at our hospital for radiation sickness contracted by playing in trees edging the parking lot of this facility."

And this is Peterborough, it says, so I'm assuming it's in Peterborough.

Did you have any sense of what the intervenor was referring to?

MR. MacQUARRIE: It's John MacQuarrie.

No, we have no sense of that. We have no knowledge about that event.

MEMBER DEMETER: And from CNSC, did you ever receive a notice of a child with radiation sickness?

Unlikely, but I have to ask.

DR. DUCROS: Caroline Ducros, for the record.

No.

MEMBER DEMETER: Okay. Thank you.

CMD 20-H2.228

Written submission from Fred and Maggie Baker

MR. LEBLANC: The next submission is from Fred and Maggie Baker, CMD 20-H2.228.

CMD 20-H2.229

Written submission from Rosanna Zerafa

MR. LEBLANC: The next submission is from Rosanna Zerafa, CMD 20-H2.229.

CMD 20-H2.230

Written submission from Katherine Fee

MR. LEBLANC: The next submission is from Katherine Fee, CMD 20-H2.230.

CMD 20-H2.231

Written submission from Judy Dixon

MR. LEBLANC: The next submission is from Judy Dixon, CMD 20-H2.231.

CMD 20-H2.232

Written submission from Annie Gelfand

MR. LEBLANC: The next submission is from Annie Gelfand, CMD 20-H2.232.

CMD 20-H2.233

Written submission from Susan Chiddix

MR. LEBLANC: The next submission is from Susan Chiddix, CMD 20-H2.233.

CMD 20-H2.234

Written submission from Craig Niziolek

MR. LEBLANC: The next submission is from
Craig Niziolek, CMD 20-H2.234.

CMD 20-H2.235

Written submission from Laura Pauk

MR. LEBLANC: The next submission is from
Laura Pauk, CMD 20-H2.235.

CMD 20-H2.236

Written submission from Riki Kretschmar

MR. LEBLANC: The next submission is from
Riki Kretschmar, CMD 20-H2.236.

CMD 20-H2.238

Written submission from Christie Nash

MR. LEBLANC: The next submission is from

Christie Nash, CMD 20-H2.238.

CMD 20-H2.239

Written submission from Judy Stewart

MR. LEBLANC: The next submission is from
Judy Stewart, CMD 20-H2.239.

CMD 20-H2.242

Written submission from Melinda Rees

MR. LEBLANC: The next submission is from
Melinda Rees, CMD 20-H2.242.

CMD 20-H2.248

Written submission from

**Catherine Prinsen, Beatrice Chan, James Wilkes,
George Campana and 33 interested persons**

MR. LEBLANC: The next submission is from
Catherine Prinsen, Beatrice Chan, James Wilkes, George
Campana as well as 33 other interested persons in
CMD 20-H2.248.

CMD 20-H2.178

Written submission from Bree and Aaron Walpole

MR. LEBLANC: And we had one intervention that was to be an oral this evening that was converted into a written from Bree and Aaron Walpole, CMD 20-H2.178.

This, Madame la Présidente, would conclude the written submissions.

THE PRESIDENT: Well, thank you, Marc.

This brings us to the close of the hearing for today. And the hearing will resume tomorrow morning at 9:30 a.m.

Again, thank you all for your participation and attendance today. Have a good evening.

--- Whereupon the hearing adjourned at 9:33 p.m., to resume on Friday, March 6, 2020 at 9:30 a.m. /
L'audience est ajournée à 21 h 33 pour reprendre le vendredi 6 mars 2020 à 9 h 30