THE REGIONAL MUNICIPALITY OF PEEL
COMMUNITY WATER FLUORIDATION COMMITTEE

REVISED AGENDA

DATE: Thursday, February 2, 2017
TIME: 1:00 PM – 3:00 PM
LOCATION: Regional Council Chamber, 5th Floor
Regional Administrative Headquarters
10 Peel Centre Drive, Suite A
Brampton, Ontario

MEMBERS: F. Dale; J. Downey; A. Groves; M. Palleschi; C. Parrish; K. Ras;
J. Sprovieri; J. Tovey
Chaired by Councillor C. Parrish or Vice-Chair Councillor J. Sprovieri

1. DECLARATIONS OF CONFLICTS OF INTEREST

2. APPROVAL OF AGENDA

3. DELEGATIONS

3.1. Dr. Raymond Ray, Retired Biochemist and Nuclear Physicist, Presenting Information in Opposition to Fluoridation

4. REPORTS

4.1. Addressing Committee Member Questions (Oral)
    Presentation by Dr. Eileen de Villa, Medical Officer of Health
    (Background information now available)

4.2. Oral Health Program Reinvestment (Oral) (Deferred from the November 24, 2016 CWFC meeting)

5. COMMUNICATIONS

5.1. Kevin Montgomery, Brampton Resident, E-mail dated December 6, 2016, Supporting Water Fluoridation (Receipt recommended)

5.2. Citation: National Research Council: 2006; Fluoride in Drinking Water: A Scientific Review of EPA’s Standards; Washington, DC: The National Academies Press; doi 10.1722611571 (Receipt recommended)
6.  IN CAMERA MATTERS

6.1 Addressing Committee Member Questions (Oral) (Advice that is subject to solicitor-client privilege, including communications necessary for that purpose)

7.  OTHER BUSINESS

7.1. Motion from Councillor Sprovieri Regarding Outstanding Information on Community Water Fluoridation (Referred from the December 8, 2016 Regional Council meeting)

8.  NEXT MEETING

Thursday, February 23, 2017, 8:30 a.m. - 9:30 a.m.
Regional Council Chamber, 5th Floor
Regional Administrative Headquarters
10 Peel Centre Drive, Suite A
Brampton, Ontario

9.  ADJOURNMENT
November 16th, 2016

Re: Request to Make a Delegation before the CWFC.

To
Chair Councilor Carolyn Parrish
Vice Chair Councilor Sprovieri
and
All Community Water Fluoridation Committee Members:
2016/11/16

Dear Madam/Sir.
On March 31st, 2016, I sent a request to make a delegation before your committee. Unfortunately that time I decided to withdraw delegation as I became very sick with cancer.

It is my understanding that you are in the final process of collecting the evidence in support and in opposition of artificial water fluoridation. Therefore I would like to request for the opportunity to resubmit my delegation for your consideration so that I shall be permitted to make a presentation before you at your next meeting on Thursday, November 24th.

Please be kind to let me know at your earliest, so that I can prepare myself for the presentation.

In this regard I like to mention that I have completed my delegation form and it has been sent to the appropriate department.

I thank you

Sincerely,
Dr. Raymond Ray
Request for Delegation

Attention: Regional Clerk
Regional Municipality of Peel
10 Peel Centre Drive, Suite A
Brampton, ON L6T 4B9
Phone: 905-791-7800 ext. 4582  Fax: 905-791-1693
E-mail: council@peelregion.ca

FOR OFFICE USE ONLY
MEETING DATE YYYY/MM/DD
2017/02/02
MEETING NAME
CWFC

REQUEST DATE YYYY/MM/DD
2016/11/16

NAME OF INDIVIDUAL(S)
Dr. Raymond Ray D. Sc.

POSITION/TITLE
Retired biochemist and nuclear physicist

NAME OF ORGANIZATION

E-MAIL

TELEPHONE NUMBER

EXTENSION

FAX NUMBER

NAME OF INDIVIDUAL(S)

POSITION/TITLE

NAME OF ORGANIZATION

E-MAIL

TELEPHONE NUMBER

EXTENSION

FAX NUMBER

REASON(S) FOR DELEGATION REQUEST (SUBJECT MATTER TO BE DISCUSSED)

I AM SUBMITTING A FORMAL PRESENTATION TO ACCOMPANY MY DELEGATION □ YES  X NO

IF YES, PLEASE ADVISE OF THE FORMAT OF YOUR PRESENTATION (ie POWERPOINT)

Note:
Delegates are requested to provide an electronic copy of all background material / presentations to the Clerk's Division at least seven (7) business days prior to the meeting date so that it can be included with the agenda package. In accordance with Procedure By-law 100-2012, as amended, delegates appearing before Regional Council or Committee are requested to limit their remarks to 5 minutes and 10 minutes respectively (approximately 5/10 slides).

Once the above information is received in the Clerk's Division, you will be contacted by Legislative Services staff to confirm your placement on the appropriate agenda. Thank you.

Notice with Respect to the Collection of Personal Information
(Municipal Freedom of Information and Protection of Privacy Act)

Personal information contained on this form is authorized under Section IV-4 of the Region of Peel Procedure By-law 100-2012 as amended, for the purpose of contacting individuals and/or organizations requesting an opportunity to appear as a delegation before Regional Council or a Committee of Council. The Delegation Request Form will be published in its entirety with the public agenda. The Procedure By-law is a requirement of Section 238(2) of the Municipal Act, 2001, as amended. Please note that all meetings are open to the public except where permitted to be closed to the public under legislated authority. All Regional Council meetings are audio broadcast via the internet and will be video broadcast on the local cable television network where video files will be posted and available for viewing subsequent to those meetings. Questions about collection may be directed to the Manager of Legislative Services, 10 Peel Centre Drive, Suite A, 5th floor, Brampton, ON L6T 4B9, (905) 791-7800 ext. 4482.
At the November 24, 2016 Community Water Fluoridation Committee (CWFC) meeting, the Committee requested an additional meeting be scheduled to allow for a more fulsome discussion of the material presented. The attached document contains responses to inquiries brought forward by the Committee and Regional Council.

The attached document also serves as the written report required as part of the motion referred to the CWFC from Regional Council meeting held on December 8, 2016.
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I. Responses to Motion referred to the CWFC from Regional Council (December 8th, 2016)

**Issue 1:**
What is the classification of the fluoridation agent (HFSA) used by the Region of Peel to artificially fluoridate the drinking water supply:

a. A medication as ruled by the Supreme Court of Canada in 1957.
b. A water treatment chemical as referred to by Health Canada.
c. A mineral nutrient, as referred to by Health Canada and the Ontario Dental Association.
d. A hazardous chemical compound as referred to by the Safety Data Sheet.

**Response:**
None of the above listed options are correct, as the classification of HFSA depends upon its purpose and use. For the purpose of fluoridating the water supply, NSF International classifies HFSA as a drinking water treatment chemical or direct additive.\(^1\)

The Region is mandated to have all drinking water additives used at the Region’s water treatment plants meet the industry accepted quality standards: the American Water Works Association (AWWA) standards and the American National Standards Institute safety criteria standard NSF 60.

**Source:**

**Issue 2:**
That staff provide the Committee the toxicology reviews that are recommended by Health Canada.

**Response:**
Health Canada, through their stewardship role, is a guardian/regulator involved in both protecting Canadians and facilitating the provision of products vital to the health and well-being of Canadian citizens. Health Canada regulates and approves the use of thousands of products, including: biologics, consumer goods, foods, medical devices, natural health products, pesticides, pharmaceuticals, and toxic substances.

Health Canada assesses the health risks, including toxicology, associated with fluoride in drinking water. The *Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride* is the review that established the guideline, ‘the maximum acceptable concentration (MAC) for fluoride in drinking water is 1.5 mg/L’. This review assessed all identified human health risks. See Section 13.0 of the document for a full list of references and studies considered in the development of the Guideline.\(^2\)

The American Water Works Association (AWWA) sets standards for all additives used in the water treatment process, and NSF International tests, certifies products and develops public health standards that help protect food, drinking water, consumer products and the environment. The review and evaluation procedures for drinking water treatment chemicals are included in Annex A of the NSF/ANSI 60-2016 standard.\(^3\)
Question and Answer: Summary Document
Community Water Fluoridation Committee (CWFC)

Source:

**Issue 3:**
That staff provide the studies that support the assertion that HFSA dissociates 100 per cent in tap water.

**Response:**
Finney et al. (2006) and Urbansky (2002) are studies that support the assertion that HFSA dissociates 100 per cent in tap water.

Under the chemical conditions (i.e., neutral pH) of municipal water, complete HFSA dissociation occurs, to release fluoride ions into the water. 4, 5

Source:

**Issue 4:**
That staff provide the toxicology studies done by Health Canada that addresses the health effects of the Free Radical Fluoride Ions released when HFSA is added to the water supply.

**Response:**
Toxicology studies completed by Health Canada that address the health effects of Free Radical Fluoride ions released when HFSA is added to the water supply do not exist because fluoride ions do not exist as free radicals.

When HFSA is added to water, it dissociates and releases fluoride ions. Fluoride ions are negatively charged anion particles. They are not free radicals. Free radicals are not released as part of the dissociation of HFSA, based on observed, empirical data. 6

Health Canada assesses the health risks associated with fluoride in drinking water. The Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride is the review that established the guideline, ‘the maximum acceptable concentration (MAC) for fluoride in drinking water is 1.5 mg/L’. This review assessed all identified human health risks. See Section 13.0 of the document for a full list of references and studies considered in the development of the Guideline. 7

The American Water Works Association (AWWA) sets standards for all additives used in the water treatment process, and NSF International tests, certifies products and develops public health standards that help protect food, drinking water, consumer products and the environment. The review and evaluation procedures for drinking water treatment chemicals are included in Annex A of the NSF/ANSI 60- 2016 standard. 8

Sources:
Issue 5:
That staff provide the toxicology studies done by Health Canada that support staff’s assertion that the accumulation of fluoride, lead, mercury and arsenic in the body have no negative health impacts on the elderly, the poorly nourished, and on people with various health conditions such as kidney disease, diabetes, cancer, autism, inflammatory bowel syndrome and other health conditions.

Response:
As a point of clarification, staff has not reported that there is not a threshold/risk of harm in relation to the accumulation of fluoride, lead, mercury and arsenic in the human body. Any chemical can be toxic or harmful under certain conditions. The toxicity of a substance depends on its chemical structure, the extent to which the substance is absorbed by the body, and the body’s ability to detoxify the substance (change it into less toxic substances) and eliminate it from the body.

As presented to the Community Water Fluoridation Committee on June 9, 2016, the lead and arsenic residuals occasionally found in HFSA are routinely tested for in the Region’s treated drinking water supply and found to consistently measure at concentrations below the legislated maximum acceptable concentration in drinking water.

Health Canada establishes maximum levels for contaminants in food, water and air. In the context of Canadian drinking water, Health Canada has set a maximum acceptable concentration (MAC) (‘guideline’) for fluoride, lead, mercury, arsenic and many other chemicals. Each guideline was established based on current, published scientific research related to health effects, aesthetic effects, and operational considerations. Health-based guidelines are established on the basis of comprehensive review of the known health effects associated with each contaminant, on exposure levels and on the availability of treatment and analytical technologies.

The American Water Works Association (AWWA) sets standards for all additives used in the water treatment process, and NSF International tests, certifies products and develops public health standards that help protect food, drinking water, consumer products and the environment. The review and evaluation procedures for drinking water treatment chemicals are included in Annex A of the NSF/ANSI 60-2016 standard.

Source:
Issue 6:
That staff address the question whether Peel Region is in violation of the Safe Clean Water Act and the Food and Drug Act by adding HFSA to the drinking water supply.

Response:
As this is the subject of legal action against the Region of Peel, a response will be provided as legal advice to the Committee in-camera.
II. Other Inquiries from Committee and Council

1.0 Response to selected quotes from the National Research Council (NRC) 2006 Report: *Fluoride in Drinking Water: A Scientific Review of EPA’s Standards*

At the request of the U.S. Environmental Protection Agency (EPA), the National Research Council convened a committee that was charged with reviewing the toxicologic, epidemiologic, and clinical data on fluoride and exposure data on orally ingested fluoride from drinking water and other sources. On the basis of its review, the Committee independently evaluated the scientific basis of the EPA Maximum-Contaminant-Level Goal (MCLG) of 4 mg/L and Secondary Maximum Contaminant Level (SMCL) of 2 mg/L of fluoride in drinking water and the adequacy of those guidelines to protect children and others from adverse health effects.

Health Canada established the maximum acceptable concentration (MAC) for fluoride in drinking water of 1.5 mg/L and the optimal concentration of 0.7 mg/L. Currently, the level of naturally-occurring fluoride in Peel’s lake-based municipal water supply is adjusted to an optimal concentration range to protect against tooth decay (0.5 to 0.8 mg/L).

Taken in the context of the full report, and the Committee’s task in preparing the report, the selected quotes, as received by the Region of Peel, are not relevant to community water fluoridation. As per the highlighted excerpts, ‘addressing questions of artificial water fluoridation, economics, risk-benefit assessment, and water-treatment technology was not part of the Committee’s charge’ (page 2), and ‘As noted earlier, the report does not evaluate nor make judgements about the benefits, safety or efficacy of artificial water fluoridation’ (page 16).

As further referenced in an email from John Doull, MD., PhD., Chair of the National Academy of Sciences, National Research Council 2006 Committee report on Fluoride in Drinking Water: “…I do not believe there is any valid scientific reason for fearing adverse health conditions from the consumption of water fluoridated at the optimal level. I also feel that there is no reason why Kansas City residents should avoid drinking the fluoridated water that is provided by the community water system.”

Source:
Fluoride in Drinking Water: A Scientific Review of EPA’s Standards

2

Fluoride in Drinking Water

(NRC) independently reviewed the health effects of ingested fluoride and the scientific basis for EPA’s MCL. It concluded that the MCL was an appropriate interim standard but that further research was needed to fill data gaps on total exposure to fluoride and its toxicity. Because new research on fluoride is now available and because the Safe Drinking Water Act requires periodic reassessment of regulations for drinking-water contaminants, EPA requested that the NRC again evaluate the adequacy of its MCLG and SMCL for fluoride to protect public health.

COMMITTEE’S TASK

In response to EPA’s request, the NRC convened the Committee on Fluoride in Drinking Water, which prepared this report. The committee was charged to review toxicologic, epidemiologic, and clinical data on fluoride—particularly data published since the NRC’s previous (1993) report—and exposure data on orally ingested fluoride from drinking water and other sources. On the basis of its review, the committee was asked to evaluate independently the scientific basis of EPA’s MCLG of 4 mg/L and SMCL of 2 mg/L in drinking water and the adequacy of those guidelines to protect children and others from adverse health effects. The committee was asked to consider the relative contribution of various fluoride sources (e.g., drinking water, food, dental-hygiene products) to total exposure. The committee was also asked to identify data gaps and to make recommendations for future research relevant to setting the MCLG and SMCL for fluoride. Addressing questions of artificial fluoridation, economics, risk-benefit assessment, and water-treatment technology was not part of the committee’s charge.

THE COMMITTEE’S EVALUATION

To accomplish its task, the committee reviewed a large body of research on fluoride, focusing primarily on studies generated since the early 1990s, including information on exposure, pharmacokinetics, adverse effects on various organ systems; and genotoxic and carcinogenic potential. The collective evidence from in vitro assays, animal research, human studies, and mechanistic information was used to assess whether multiple lines of evidence indicate human health risks. The committee only considered adverse effects that might result from exposure to fluoride; it did not evaluate health risk from lack of exposure to fluoride or fluoride’s efficacy in preventing dental caries.

After reviewing the collective evidence, including studies conducted since the early 1990s, the committee concluded unanimously that the present MCLG of 4 mg/L for fluoride should be lowered. Exposure at the MCLG clearly puts children at risk of developing severe enamel fluorosis, the major anticaries benefit of fluoride is topical and not systemic (Zeno et al. 1992; Rolla and Ekstrand 1996; Featherstone 1998; Limeback 1999a; Clarkson and Mcloughlin 2000; CDC 2001; Pejerskov 2004). Thus, it has been argued that water fluoridation might not be the most effective way to protect the public from dental caries.

Public health agencies have long disputed these claims. Dental caries is a common childhood disease. It is caused by bacteria that colonize on tooth surfaces, where they ferment sugars and other carbohydrates, generating lactic acid and other acids that decay tooth enamel and form a cavity. If the cavity penetrates to the dentin (the tooth component under the enamel), the dental pulp can become infected, causing toothaches. If left untreated, pulp infection can lead to abscess, destruction of bone, and systemic infection (Cawson et al. 1982; USDHHS 2000). Various sources have concluded that water fluoridation has been an effective method for preventing dental decay (Newburn 1989; Riva 1993; Horowitz 1996; CDC 2001; Truman et al. 2002). Water fluoridation is supported by the Centers for Disease Control and Prevention (CDC) as one of the 10 great public health achievements in the United States, because of its role in reducing tooth decay in children and tooth loss in adults (CDC 1999). Each U.S. Surgeon General has endorsed water fluoridation over the decades it has been practiced, emphasizing that “[a] significant advantage of water fluoridation is that all residents of a community can enjoy its protective benefit. . . A person’s income level or ability to receive dental care is not a barrier to receiving fluoridation’s health benefits” (Carmona 2004).

As noted earlier, this report does not evaluate nor make judgments about the benefits, safety, or efficacy of artificial water fluoridation. That practice is reviewed only in terms of being a source of exposure to fluoride.

HISTORY OF EPA’S REGULATION OF FLUORIDE

In 1975, EPA proposed an interim primary drinking-water regulation for fluoride of 1.4–2.4 mg/L. That range was twice the “optimal” range of 0.7–1.2 mg/L recommended by the U.S. Public Health Service for water fluoridation. EPA’s interim guideline was selected to prevent the occurrence of objectionable enamel fluorosis, motting of teeth that can be classified as mild, moderate, or severe. In general, mild cases involve the development of white opaque areas in the enamel of the teeth, moderate cases involve visible brown staining, and severe cases include yellow to brown staining and pitting and cracking of the enamel (NRC 1993). EPA considered objectionable enamel fluorosis to involve moderate to severe cases with dark stains and pitting of the teeth.

The history of EPA’s regulation of fluoride is documented in 50 Fed. Reg. 20164 (1985). In 1981, the state of South Carolina petitioned EPA...
2.0 Dental programs in the Region of Peel and their related expenditures

In addition to population level community water fluoridation, Peel Public Health also protects the oral health of Peel’s residents at the individual and community level. At the individual level, dental screening is provided to children and youth in schools and community clinics. Children and youth identified as having an oral health preventive or treatment need are referred to available programs and services. There are also specific programs for adults (e.g., recently launched Smile with Confidence Pilot Adult Dental program) and seniors (i.e., the Seniors’ Dental Program) in need of treatment.

At the community level, oral health promotion, such as outreach activities in collaboration with community partners, and promoting good oral health practices help decrease the risk of poor oral health outcomes among priority populations.

Peel Public Health also continues to monitor local level oral and population health data, available through program delivery and other data sources, as well as the scientific literature on community water fluoridation.

In 2016, Peel Public Health screened over 70,000 children and youth and provided preventive services to over 4,000 children, based on need. As part of the Smile with Confidence Pilot Program, approximately 100 clients are being treated. Since its inception in 2008, the Seniors’ Dental Program has provided services to approximately 9,538 clients.

Related Expenditures:
The Region of Peel has a planned investment of $9,630,497 for oral health programs and services in 2017. This includes $4,697,700 under the Healthy Smiles Ontario (HSO) program that is 100 per cent funded by the Ministry of Health and Long-Term Care (MOHLTC), $3,629,184 for Oral Health programs within the mandatory programs (75 per cent funded by the MOHLTC) and $1,303,613 for the Seniors Dental Program (100 per cent Regional tax levy).

For more information:
For more information, please refer to the Region of Peel Council Report, 2016 Peel Oral Health Status Report (February 9, 2017).

3.0 Information on children’s dental programs available in British Columbia

In review of children’s dental programs available in British Columbia (BC), a variety of approaches were noted that were comparable to oral health programming in Ontario and Peel.

Provincial:
There are provincial oral health initiatives in BC, such as the provincial Kindergarten Dental Survey to assess the dental health of kindergarten aged children, and the BC Healthy Kids Program to help low income families with the costs of basic dental care and prescription eyewear for their children.
Health Authorities:
As well, the health authorities (i.e., Fraser Health, Interior Health, Vancouver Island Health, Northern Health and Vancouver Coastal Health) within BC provide various dental initiatives (e.g., fluoride varnish programs, oral health screening, risk assessment for tooth decay, referrals, education, emergency dental care, one-to-one consultation) to a variety of target groups (e.g., children and youth, low-income families, at risk-pregnant women, First Nations, children with developmental disabilities).

Vancouver Coastal Health School-Based Programming:
The Vancouver Public Health Dental Program offers a children’s dental program for eligible children up to grade 7, students up to grade 12 with a dental emergency and all children less than three years. Dental program staff provide community outreach to help identify children at risk for tooth decay. As well, The Smile to Smile, Knee to Knee program offers clinics for children aged 12 to 36 months not accessing regular dental services. These outreach clinics take place in various community settings.

Cost Comparison:
At this stage, a cost comparison to the Region of Peel is not possible given the variation in provincial, regional and local provision of oral health programming (e.g., services offered, target population), and the availability of data required to complete the analysis.

4.0 Results from review of McLaren et al. (2016) Calgary study

Calgary, Alberta discontinued community water fluoridation in 2011, whereas Edmonton, Alberta continues the practice of community water fluoridation. In 2004/05 and 2013/14, McLaren et al. (2016) assessed rates of tooth decay of primary teeth among children in grade two living in Calgary and Edmonton. McLaren et al. (2016) report an increase in tooth decay of primary teeth in grade two children living in Calgary and Edmonton. This increase in tooth decay was larger, and more consistent, in Calgary where community water fluoridation had been discontinued. The change over time in mean decayed, extracted or filled primary surfaces in Calgary = 2.87 (p<0.05) and in Edmonton = 1.60 (p<0.05). Differences in change over time between Calgary and Edmonton was statistically significant (p<0.05).

The limitations of the study include: it is unclear if the study sample from Calgary and Edmonton were representative of the population in 2004/05 and 2013/14; the oral examination criteria and procedure at the two time points were not identical; and pre-cessation data was several years prior to cessation.

Source:
5.0 Inquiry on Finney et al. (2006) Michigan study

In response to an inquiry about the type of water (i.e., tap or distilled) and fluoride used in the Finney et al. (2006) study:

Nanopure water was utilized because it was a controlled laboratory experiment to determine if a particular agent would dissociate under different pH levels. The control was necessary to ensure accuracy in understanding the chemical reaction. It is unclear if the fluoride agent was pharmaceutical grade.

Source:

6.0 Effectiveness of community water fluoridation

Presented to the Community Water Fluoridation Committee on November 24, 2016.

The body of research evidence shows that community water fluoridation is effective at reducing tooth decay. When comparing rates of tooth decay in fluoridated areas to those in low/non-fluoridated areas, the research shows a 35% reduction in cavities of baby teeth, 26% reduction in cavities in permanent teeth and 15% increase in children with no cavities.

Source:

7.0 Safety of community water fluoridation

Presented to the Community Water Fluoridation Committee on November 24, 2016.

7.1 Health Effects:
The body of evidence does not support a link between fluoride in drinking water at the optimal concentration of 0.7mg/L and any adverse health effects, including cancer of all causes, thyroid cancer, bone cancer/osteosarcoma, intelligence, congenital malformations, dementia, still births, Down syndrome, sudden infant death syndrome, mental retardation, skeletal fluorosis, bone fracture, hip fracture, osteoporosis, goitre, urinary stone disease, coronary heart disease/mortality, and all-cause mortality.

Source:
7.2 Toxicology:

Health Canada assesses the health risks associated with fluoride in drinking water. The Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Fluoride is the review that established the guideline, ‘the maximum acceptable concentration (MAC) for fluoride in drinking water is 1.5 mg/L’. This review assessed all identified human health risks. See Section 13.0 of the document for a full list of references and studies considered in the development of the Guideline.23

The American Water Works Association (AWWA) sets standards for all additives used in the water treatment process, and NSF International tests, certifies products and develops public health standards that help protect food, drinking water, consumer products and the environment. The review and evaluation procedures for drinking water treatment chemicals are included in Annex A of the NSF/ANSI 60-2016 standard.24

Source:

7.3 Hydrofluorosilicic Acid (HFSA):

The fluoridation additive used in Peel for community water fluoridation is hydrofluorosilicic acid (HFSA) from phosphorite rock. Through the Safe Drinking Water Act, 2002, the Ministry of the Environment and Climate Change (MOECC) regulates and enforces how additives used in drinking water systems in Ontario are handled, stored, added, monitored, controlled and reported. Through annual inspections, the MOECC ensures that the drinking water systems that fluoridate do so in accordance with the Technical Support Document for Ontario Drinking Water Standards, Objectives and Guidelines, that the systems are designed to conform with the Design Guidelines for Drinking Water Systems and that all additives, including HFSA, that come in contact with drinking water meet the applicable standards set by the American Water Works Association (AWWA) and the safety criteria standard NSF 60.25 The AWWA sets standards for all additives used in the water treatment process, and NSF International tests, certifies products and develops public health standards that help protect food, drinking water, consumer products and the environment.

Under the chemical conditions (i.e., neutral pH) of municipal water, complete HFSA dissociation occurs, to release fluoride ions into the water.26, 27

Health Canada establishes maximum level for contaminants in food, water and air. In the context of Canadian drinking water, Health Canada has set a maximum acceptable concentration (MAC) (‘guideline’) for lead, arsenic and many other chemicals. Each guideline was established based on current, published scientific research related to health effects,
aesthetic effects, and operational considerations. Health-based guidelines are established on the basis of comprehensive review of the known health effects associated with each contaminant, on exposure levels and on the availability of treatment and analytical technologies.\textsuperscript{28}

As presented to the Community Water Fluoridation Committee on June 9, 2016, the lead and arsenic residuals occasionally found in HFSA are routinely tested for in the Region’s treated drinking water supply and found to consistently measure at concentrations well below the legislated maximum acceptable concentration in drinking water.

Source:

\subsection*{7.4 Pharmaceutical Grade Fluoride:}
Pharmaceutical grade fluoride compounds fall under the Food and Drug Administration (FDA) and are used in the formulation of prescription medications, not for use in water treatment. Unlike the HFSA described above, they are not subjected to the stringent NSF and AWWA standards and diligent testing for lead and arsenic. It is therefore not certain that pharmaceutical grade fluoride is a higher quality product with fewer residual components.
8.0 Fluorosis

The Canadian Health Measures Survey collects health information through both household interviews and direct physical measures. Fluorosis among Canadian children aged 6 to 12 years using the Dean’s Index (Table 2) was completed during the 2007-2009 cycle (results are presented in Table 3).²⁸

**Table 2**: Dean’s Index codes for recording dental fluorosis

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Normal</td>
<td>The enamel surface is smooth, glossy and usually a pale creamy-white colour</td>
</tr>
<tr>
<td>1</td>
<td>Questionable</td>
<td>The enamel shows slight aberrations from the translucency of normal enamel, which may range from a few white flecks to occasional spots</td>
</tr>
<tr>
<td>2</td>
<td>Very mild</td>
<td>Small opaque, paper-white areas scattered irregularly over the tooth, but involving less than 25% of the labial tooth surface</td>
</tr>
<tr>
<td>3</td>
<td>Mild</td>
<td>The white opacity of the enamel of the teeth is more extensive than for code 2, but covers less than 50% of labial tooth surface</td>
</tr>
<tr>
<td>4</td>
<td>Moderate</td>
<td>The enamel surfaces of the teeth show marked wear and brown stain is frequently a disfiguring feature</td>
</tr>
<tr>
<td>5</td>
<td>Severe</td>
<td>The enamel surfaces are badly affected and hyperplasia is so marked that the general form of the tooth may be affected. There are pitted or worn areas and brown stains are widespread; the teeth often have a corroded appearance</td>
</tr>
<tr>
<td>6</td>
<td>All 4 anterior teeth absent</td>
<td>Could also be unavailable for assessment since bandade</td>
</tr>
</tbody>
</table>
African Americans in the United States:

Presented to the Community Water Fluoridation Committee on November, 24, 2016.

The research evidence reviewed indicates that African Americans in the United States have higher rates of fluorosis, compared to whites and Hispanics. Some of the studies investigated possible contributing factors to the difference in rates (i.e., the use of more toothpaste and fluoride rinses). Among the studies cited on possible explanations for differences in rates, there were limited conclusions that could be drawn as a result of study methodology. The possible contributing factors are only suggestive and not conclusive, as a direct association was not observed. To date, there are not any population health assessment measures for Peel, Ontario or Canada that report on fluorosis by ethnicity.

Sources:
9.0 Sources of Fluoride

Presented to the Community Water Fluoridation Committee on November 24, 2016.

Potential sources of exposure of the general population to fluoride include water, food and beverages, oral health products (e.g., fluoride-containing toothpaste), soil and the atmosphere.

Other sources, beyond drinking water, of exposure were accounted for when the Maximum Acceptable Concentration (1.5ppm) was set by Health Canada.33

Source:
4. REPORTS

4.3 Oral Health Program Reinvestment (Oral)

Deferred to the next CWFC meeting
Hello members of Regional Council. It has come to my attention that residents in Peel might be in some danger. A questionable product is being delivered to their homes, paid for by their tax dollars. This product includes several elements that are known to be toxic, corrosive, combustible, and makes metals such as steel become brittle and fracture. Why, in anyone’s right mind, would they want to be a participant in consuming these dangerous elements? It’s simple. One of these elements if hydrogen, the other, oxygen. When combined correctly, the product is H2O -- water. It’s remarkable how information taken out of context, combined with sensationalism, can convince people to make rash decisions. I urge Peel Council to not make a rash decision by removing fluoridation from our drinking water. Rather than inundate Council with irrelevant information, plucked from out of context, I will remind Council of a study that has already been completed for the Region of Peel: Dr. Dick Ito’s “A Cross-Sectional Study To Compare Caries And Fluorosis In 7-Year-Old Schoolchildren From A Fluoridated Area With Those In A Neighbouring Non-Fluoridated Area In Ontario.” There are 4 key takeaways from this study, and it’s repeated reporting to Peel Council: 1. The mechanics of how fluoride actually works to prevent dental caries. 2. The original studies that prove fluoridated water is effective and safe. 3. That community water is cost-effective and benefits all consumers across all income levels, and; 4. That the levels of fluoride in municipal drinking water do not contribute to dental fluorosis. This can be broken down even simpler. In the over 60 years that water fluoridation started taking place in North America, and indeed the world, there is both evidence to support its benefits, AND to prove it does not cause harm. Fluoridation is good for the public. Please don’t let fear and sensationalism trick you into making a rash decision. Please continue to fluoridate our drinking water. Sincerely, Kevin Montgomery Brampton resident

Selected Quotes

**FLUORIDE'S EFFECTS ON THE BRAIN:**

"On the basis of information largely derived from histological, chemical, and molecular studies, it is apparent that fluorides have the ability to interfere with the functions of the brain and the body by direct and indirect means." p187

"Fluorides also increase the production of free radicals in the brain through several different biological pathways. These changes have a bearing on the possibility that fluorides act to increase the risk of developing Alzheimer's disease." p186

"The possibility has been raised by the studies conducted in China that fluoride can lower intellectual abilities." p187

"Studies of populations exposed to different concentrations of fluoride should be undertaken to evaluate neurochemical changes that may be associated with dementia. Consideration should be given to assessing effects from chronic exposure, effects that might be delayed or occur late-in-life, and individual susceptibility." p187

"Two small studies have raised the possibility of an increased incidence of spina bifida occulta in fluorosis-prone areas in India; larger, well-controlled studies are needed to evaluate that possibility further." p164

**FLUORIDE'S EFFECTS ON THE ENDOCRINE SYSTEM:**

"In summary, evidence of several types indicates that fluoride affects normal endocrine function or response; the effects of the fluoride-induced changes vary in degree and kind in different individuals. Fluoride is therefore an endocrine disruptor in the broad sense of altering normal endocrine function or response, although probably not in the sense of mimicking a normal hormone. The mechanisms of action remain to be worked out and appear to include both direct and indirect mechanisms, for example, direct stimulation or inhibition of hormone secretion by interference with second messenger function, indirect stimulation or inhibition of hormone secretion by effects on things such as calcium balance, and inhibition of peripheral enzymes that are necessary for activation of the normal hormone." p223

**FLUORIDE'S EFFECTS ON THE THYROID:**

"several lines of information indicate an effect of fluoride exposure on thyroid function." p197

"Fluoride exposure in humans is associated with elevated TSH concentrations, increased goiter prevalence, and altered T4 and T3 concentrations; similar effects on T4 and T3 are reported in experimental animals." p218
"In humans, effects on thyroid function were associated with fluoride exposures of 0.05-0.13 mg/kg/day when iodine intake was adequate and 0.01-0.03 mg/kg/day when iodine intake was inadequate." p218 Note: For a 70kg/154pounds person 0.01mg/kg is equal to 0.7mg fluoride, what one would consume after drinking 1 liter of fluoridated water.

Iodine deficiency is increasing world-wide:
36% of women in USA [http://www.cdc.gov/nchs/products/pubs/pubd/hestats/iodine.htm]
70% of women in Australia [http://www.abc.net.au/health/thepulse/stories/2006/11/06/2399550.htm]

"Intake of nutrients such as calcium and iodine often is not reported in studies of fluoride effects. The effects of fluoride on thyroid function, for instance, might depend on whether iodine intake is low, adequate, or high, or whether dietary selenium is adequate." p222

FLUORIDE'S EFFECTS ON THE PINEAL GLAND:

"The single animal study of pineal function indicates that fluoride exposure results in altered melatonin production and altered timing of sexual maturity (Table 8-1)."

"Recent information on the role of the pineal organ in humans suggests that any agent that affects pineal function could affect human health in a variety of ways, including effects on sexual maturation, calcium metabolism, parathyroid function, postmenopausal osteoporosis, cancer, and psychiatric disease." p221-22

FLUORIDE'S EFFECTS ON INSULIN SECRETION/DIABETES:

"The conclusion from the available studies is that sufficient fluoride exposure appears to bring about increases in blood glucose or impaired glucose tolerance in some individuals and to increase the severity of some types of diabetes. In general, impaired glucose metabolism appears to be associated with serum or plasma fluoride concentrations of about 0.1 mg/L or greater in both animals and humans. In addition, diabetic individuals will often have higher than normal water intake, and consequently, will have higher than normal fluoride intake for a given concentration of fluoride in drinking water. An estimated 16-20 million people in the U.S. have diabetes mellitus; therefore, any role of fluoride exposure in the development of impaired glucose metabolism or diabetes is potentially significant." p. 217

FLUORIDE'S EFFECTS ON THE IMMUNE SYSTEM:

"Nevertheless, patients who live in either an artificially fluoridated community or a community where the drinking water naturally contains fluoride ... have all accumulated fluoride in their skeletal systems and potentially have very high fluoride concentrations in their bones. The bone marrow is where immune cells develop and that could affect humoral immunity and the production of antibodies to foreign chemicals." p249

"it is important to consider subpopulations that accumulate large concentrations of fluoride in their bones (e.g., renal patients). When bone turnover occurs, the potential exists for immune
system cells and stem cells to be exposed to concentrations of fluoride in the interstitial fluids of bone that are higher than would be found in serum. From an immunologic standpoint, individuals who are immunocompromised (e.g., AIDS, transplant, and bone-marrow-replacement patients) could be at greater risk of the immunologic effects of fluoride.” p 258

**FLUORIDE’S INTERACTIVE/SYNERGISTIC EFFECTS (aluminum, lead):**

“Available information now indicates a role for aluminum in the interaction of fluoride on the second messenger system; thus, differences in aluminum exposure might explain some of the differences in response to fluoride exposures among individuals and populations.” p222

“With the increasing prevalence of acid rain, metal ions such as aluminum become more soluble and enter our day-to-day environment; the opportunity for bioactive forms of AIF to exist has increased in the past 100 years. Human exposure to aluminofluorides can occur when a person ingests both a fluoride source (e.g., fluoride in drinking water) and an aluminum source; sources of human exposure to aluminum include drinking water, tea, food residues, infant formula, aluminum-containing antacids or medications, deodorants, cosmetics, and glassware.” p42

“Another possible explanation for increased blood lead concentrations which has not been examined is the effect of fluoride intake on calcium metabolism; a review by Goyer (1995) indicates that higher blood and tissue concentrations of lead occur when the diet is low in calcium. Increased fluoride exposure appears to increase the dietary requirement for calcium (see Chapter 8); in addition, the substitution of tap-water based beverages (e.g., soft drinks or reconstituted juices) for dairy products would result in both increased fluoride intake and decreased calcium intake.” p43

“[G]iven the expected presence of fluoride ion (from any fluoridation source) and silica (native to the water) in any fluoridated tap water, it would be useful to examine what happens when that tap water is used to make acidic beverages or products (commercially or in homes), especially fruit juice from concentrate, tea, and soft drinks. Although neither Urbansky (2002) nor Morris (2004) discusses such beverages, both indicate that at pH < 5, SiF6 2- would be present, so it seems reasonable to expect that some SiF6 2- would be present in acidic beverages but not in the tap water used to prepare the beverages. Consumption rates of these beverages are high for many people, and therefore the possibility of biological effects of SiF62-, as opposed to free fluoride ion, should be examined.” p44

**FLUORIDE & DOWNS SYNDROME:**

“The possible association of cytogenetic effects with fluoride exposure suggests that Down’s syndrome is a biologically plausible outcome of exposure.” p170

“A reanalysis of data on Down’s syndrome and fluoride by Takahashi (1998) suggested a possible association in children born to young mothers. A case-control study of the incidence of Down’s syndrome in young women and fluoride exposure would be useful for addressing that issue. However, it may be particularly difficult to study the incidence of Down’s syndrome today given increased fetal genetic testing and concerns with confidentiality.” 172
FLUORIDE'S EFFECTS ON THE GASTROINTESTINAL SYSTEM:

“There are a few case reports of GI upset in subjects exposed to drinking water fluoridated at 1 mg/L.

Those effects were observed in only a small number of cases, which suggest hypersensitivity.” p. 250

“Studies are needed to evaluate gastric responses to fluoride from natural sources at concentrations up to 4 mg/L and from artificial sources.” p. 258

FLUORIDE'S EFFECTS ON THE KIDNEY:

“Human kidneys... concentrate fluoride as much as 50-fold from plasma to urine. Portions of the renal system may therefore be at higher risk of fluoride toxicity than most soft tissues.” p236

“future studies should be directed toward determining whether kidney stone formation is the most sensitive end point on which to base the MCLG.” p247

FLUORIDE & CANCER:

“Fluoride appears to have the potential to initiate or promote cancers, particularly of the bone, but the evidence to date is tentative and mixed (Tables 10-4 and 10-5). As noted above, osteosarcoma is of particular concern as a potential effect of fluoride because of (1) fluoride deposition in bone, (2) the mitogenic effect of fluoride on bone cells, (3) animal results described above, and (4) pre-1993 publication of some positive, as well as negative, epidemiologic reports on associations of fluoride exposure with osteosarcoma risk.” p. 286

“Because fluoride stimulates osteoblast proliferation, there is a theoretical risk that it might induce a malignant change in the expanding cell population. This has raised concerns that fluoride exposure might be an independent risk factor for new osteosarcomas.” p109

“Osteosarcoma presents the greatest a priori plausibility as a potential cancer target site because of fluoride's deposition in bone, the NTP animal study findings of borderline increased osteosarcomas in male rats, and the known mitogenic effect of fluoride on bone cells in culture (see Chapter 5). Principles of cell biology indicate that stimuli for rapid cell division increase the risks for some of the dividing cells to become malignant, either by inducing random transforming events or by unmasking malignant cells that previously were in nondividing states.” p275
US EPA commissioned the National Research Council (NRC), a branch of the National Academy of Sciences (NAS) to do this review. The National Academies is the most prestigious, independent scientific body in the US, founded to provide scientific advice to US government agencies. They used a “weight-of-evidence” approach. They did not examine efficacy. They only examined safety. The report was written by 12 experts and peer-reviewed by 14 experts. As well, public meetings were held.

The 12 committee members selected by the NAS reviewed over 1,000 research papers. The panel members selected for their recognized expertise in the fields of toxicology, risk assessment, epidemiology, and experience on fluoride health effects. The panel members spent thousands of hours over three years and received no compensation for their work. One Canadian panel member was chosen - Dr. Hardy Limeback, DDS, PhD, Head of Preventive Dentistry, U of Toronto, who has conducted several decades of primary research in biochemical effects of fluoride.

This is the most thorough review, of the highest quality ever done on this subject. It is a landmark review on the toxicology of fluoride in drinking water. 4 Types of scientific studies available for toxicological assessment: 1) studies on tissues or cells outside of living organisms (in vitro); 2) animal studies; 3) case reports on humans injured or diseased by fluoride; 4) epidemiological studies on humans. Randomized Controlled Trials of the harmful effects of fluoride do not exist. It is unethical to purposely expose humans to any medical treatment with the goal of determining the doses that produce harm.
10.4. **Report of the Community Water Fluoridation Committee (CWFC-6/2016) meeting held on November 24, 2016**

Moved by Councillor Sprovieri,  
Seconded by Councillor Palleschi;

Whereas the Community Water Fluoridation Committee has been meeting since July 2015;

And whereas, staff have provided the Committee some written reports with back up documentation and some verbal reports with no back up documentation;

Therefore be it resolved, that staff bring a written report with supporting documentation to the next Community Water Fluoridation Committee meeting addressing the following issues:

1. What is the classification of the fluoridation agent (HFSA) used by the Region of Peel to artificially fluoridate the drinking water supply.

2. A medication as ruled by the Supreme Court of Canada in 1957.
   a. A water treatment chemical as referred to by Health Canada.
   b. A mineral nutrient, as referred to by Health Canada and the Ontario Dental Association.
   c. A hazardous chemical compound as referred to by the Safety Data Sheet.

3. That staff provide the Committee the toxicology reviews that are recommended by Health Canada.

4. That staff provide the studies that support the assertion that HFSA Dissociates 100 per cent in tap water.

5. That staff provide the toxicology studies done by Health Canada that addresses the health effects of the Free Radical Fluoride Ions released when HFSA is added to the water supply.

6. That staff provide the toxicology studies done by Health Canada that support staff’s assertion that the accumulation of fluoride, lead, mercury and arsenic in the body have no negative health impacts on the elderly, the poorly nourished, and on people with various health conditions such as kidney disease, diabetes, cancer, autism, inflammatory bowel syndrome and other health conditions.

7. That staff address the question whether Peel Region is in violation of the Safe Clean Water Act and the Food and Drug Act by adding HFSA to the drinking water supply.

Deferred to the next CWFC meeting