

Submission to the Special Meeting of the Durham Council

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Submission by: Paul-André Larose, Ph.D., Oshawa, Ontario, CANADA.
tel: 905-404-2929; E-Mail: LarosePA@Sympatico.Ca

The Incinerator Project: Limits to Nanoparticle Capture and Consequent Health Effects

A digital version of this presentation will be forwarded to the Clerk.
Important points below are highlighted.

Note: Items in light gray, if any, were skipped off in the verbal presentation as a result of time constraints.

Executive Summary.

Nanoparticles have unique abilities in terms of solubility and their ability to penetrate normally opaque biological barriers.

Any system that pretends being able to filter them actually makes false representation. In particular, Nanos, some of which have linear dimensions less than that of visible light wavelengths, **CANNOT** be removed from a high airflow system using the "Bag House" component of the Air Pollution Control system for the proposed incinerator.

The Pharmaceutical Industry has recognized the unique biological barrier penetrating capabilities of Nanos and is pursuing research to develop targeted drug delivery systems using Nano carriers.

Conversely, given their exceptional penetrating capabilities, Nanos that contain toxic components will wreck havoc in healthy peoples. This will lead to an increased chemical "Body Burden" and consequent medical issues.

Thus, any determination of the health consequences of incineration is gravely in error when the risks are only measured in terms of mortality.

A demonstration will be made, if requested, to illustrate the general behavior of Nanos.

I – Introduction

My name is Paul-André Larose. I have a Ph.D. in Physics from McMaster University in Hamilton and I currently reside in Oshawa. As per my usual practice, I will send a copy of my talk to the Clerk.

Ask a barber if you need a haircut or a Chevrolet salesman what is the best type of car and you will get an easily pre-determined answer. Similarly, talk to Incinerator "Consultants" about municipal waste and you will be given the praises of Incineration.

In this talk, I will address the issue of Incineration because it is the one that is on the table. There are however numerous other irresponsible courses of action that our society is currently pursuing. These will not be discussed here; I can later outline some of those if asked.

As far as the Incinerator issue is concerned, I can only hope that **any Councillor who proposes to support the issue pay close attention to what I have to say at the end of this delegation.**

First, I want to express my grief for what has happened to **Councillor Diamond**. This shows how fragile health can be and the need for all of us to protect the environment that we live in. All Councillors should consider this when considering incinerator related issues – this project goes against the very principle of protecting the environment and, by extension, the health of the residents.

Moreover, I understand that **a representative from the United States** was to be here to address this Council. I must say that I am ashamed that this Country did not allow in someone representing those at the receiving end of our garbage, yet it continues to allow the quasi-criminal export of its "Thermally Treated" wastes - and of its Asbestos, I might add.

For this, I extend my apologies to the American people and **I urge them to raise their concerns with their own political leaders.**

My presentation today basically aims at putting in proper perspective the issue of Nanoparticles.

Like the previous 44 others that dealt with the countless **Environmental, Financial and Health** factors that were previously presented to this Council (and that were effectively ignored by politicians), I intend to **present the facts as they are – not as some would like us to see them.**

Indeed, I am **NOT** here to confuse the issue, but to present the **Truth**, even if it can be mildly annoying to some. If asked, I can expand further.

Councillors, ignoring the facts will NOT make them go away. Think of the **Challenger Shuttle Disaster** where the views of those who knew were ignored in favor of political expediencies.

It was **Mark Twain** who once said: “It ain’t what you don’t know that gets you into trouble. It is what you know for sure that jut ain’t so”.

II – The Rationale

Nanos are **essential contributors** to the negative health impacts discussed elsewhere.
This is not just an issue that affects the recipients only.
There is also an important bio-concentration effect.

Characteristics of the Nanos: **The ratio of volume to surface goes to Zero**

Nanoparticles (NP) are solid colloidal particles ranging in size from 1 to 1000 nM.

To put things in Perspective, note that the **Visible Light Spectrum ~5,000 A or ~500 nM or ~0.500 μM**
Nanos are roughly in the halfway mark in the 1 to 1000 nM range – **SMALL, but POTENT.**

Size: **PM <2.5**: Particle sizes are **NOT** limited to 2.5 Microns, but are occupying a complete distribution of sizes below this value.

Notice the “Less Than” symbol
In fact, particle sizes go down to the Angstrom range

Their large **surface to volume ratios** give them **very special properties**, e.g. think of...
Grain Dust – an explosive mixture
Coal Dust – an explosive mixture

They have **Good Suspensibility and Excellent Penetrability of Biological Barriers** that are normally providing biological protection against external invaders.

We are dangerously fooling ourselves when the impact of the Nanos is considered as “Insignificant” because they do not correspond to much tonnage. Indeed, they do not add much in terms of **Aggregate Mass** but their impact is a function of their **Aggregate Count** (or Quantity).

The **capture** of such Nanos is a **physical impossibility** – particularly in a high airflow system.
This is **similar to the Pre-screening Issue** that I previously discussed;
Cost rise Asymptotically as the never-achievable limit is approached.

Why be concerned about the Nanos?
Nanos are an **UNAVOIDABLE** consequence of the Combustion Process, irrespective of the temperature and residence time within the Combustion Chamber
Their very presence is a precursor to Chemical and Biological reactivity.
Nanos go through heretofore-impenetrable biological barriers.

Now, let me say a few words about engine oil filters in order to illustrate the impossibility of the selective removal of the Nanos...

Filters, of any types, are expected to trap particulates much larger than the size of their porosity
They cannot extract materials that have dimensions comparable to the pores of the filters
Hence, oil filters cannot process the Nanos within the engine oil – if this were possible, engine oil changes would never be required.

III – The Nanos: Lab. Demo – >>> Do If REQUESTED IN QUESTION PERIOD

Large vs small “Nanos”
Electron Microscopy x10,000

How to Increase Capture:

Decrease Mesh Size – Physical Limit + Back Pressure

Conflicting Requirements – this leads to a Physical Impossibility

Marketing uses a “Make-Believe” description to give a False Impression of Filtering.

Consequences:

Nanos “Untrappable” as size decreases – irrespective of Cost
Health effects related to Quantity of Nanos, not their Aggregate Mass
So-called filter expected to capture particulates comparable to their porosity
AND comparable to the visible wavelength – **IMPOSSIBLE** – even if you believe in Santa Claus

Viewing the Nanos:

Vacuum Cleaner Exhaust – Inside or Outside (Central Vacuum System)

IV – Nanos and the Pharmaceutical Industry

The Pharmaceutical Industry has recognized that Nanos are highly penetrating of Biological Barriers.

Much research is currently targeted at using Nanos as Selective Carriers for Medication

These are known as “**nanoscaled drug delivery devices**”

Main potential areas are penetration of the **BBB (Blood Brain Barrier) and BFB (Blood Fetus Barrier)**.

Just to illustrate the **presumptuous assertions** presented to you, let me point out that, not that many years ago, it was falsely believed that the fetus was intrinsically protected against environmental contamination in the mother’s blood stream.

Given the capabilities of the Nanos, one can readily imagine the resulting amount of body contamination that they can inflict when they penetrate biological barriers!

Some illustrative **quotes from Industry Research**...

“Indeed, the novel properties of nanoparticles offer the ability to interact with complex cellular functions in new ways”.

“Target-specific drug therapy and methods for early diagnosis of pathologies are the priority research areas where nanotechnology would play a vital role”

“Nanoparticles in the pharmaceutical biotechnology sector improve the therapeutic index”

V - Postscript

In addition to the above consideration, a recent occurrence of the consequence of operating critical systems without redundancies – as this Council was already foretold, i.e.

a major failure in the NY Waste Water Treatment Plant that occurred on Wed. 2011/0720.

As a result, beaches along the Hudson River were closed. We may be able to operate without beaches for an extended period of time, but **we cannot ask people to withhold their breathing** when there are occurrences of high levels of emissions.

The same goes true for agricultural crops.

Operating a mission-critical system in this manner is never a good idea - much like driving a car without a spare tire.

VI – Conclusions

The economist **Thomas Sowell** once noted that "It is hard to imagine a more stupid or more dangerous way of making decisions than by putting those decisions in the hands of people who pay no price for being wrong".

Consequently, I propose that any Durham Region Councillor who supports incineration, as well as the non-elected Chair, make **the unconditional commitment of a 50% claw-back of their Regional Pension** to be effective when the predicted technical, environmental, health or economic issues do arise.

Why would they be reluctant to do so if they believe that incineration is so safe?

Moreover, it is clear that the pursuing of the Incineration Project is a "**Crime Against Humanity**" that cannot stand the test of Morality.

The **Charter of Rights and Freedom** (Part 1 of the Constitution, Section 7) makes reference to "Right to the Security of the Person and the Right not to be deprived thereof". **This includes the right not to be poisoned by this form of "Second-Hand Emissions"**.

These are some of the legal avenues that Citizens will have to pursue if this Council fails in its stewardship responsibilities.

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