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Sent Date: Mon May 11 00:39:28 2026  
To: Nuclear Waste / Déchets Nucléaires (IAAC/AEIC)  
CC:  
Subject: Transportation and Health

**TO:** Impact Assessment Agency of Canada (IAAC) 88774

**RE:** Formal Submission Regarding the Transportation of Nuclear Waste: Radiological Impact Assessment and the Systemic Vulnerabilities of the Northern Corridor

## **1. Defining the Nuclear Risk: The Invisible Footprint**

The primary risk of nuclear waste transportation is not limited to accidents; it includes the routine, constant emission of ionizing radiation through intact transport casks with **12-inch solid steel walls**. This "Shine" creates an unavoidable radiological footprint composed of a potent "cocktail" of three primary emitters:

- **Caesium-137 (Gamma Rays):** Penetrating radiation capable of passing through steel and human tissue.
- **Cobalt-60 (High-Energy Gamma Rays):** Extremely energetic rays that are significantly more difficult to block than Caesium.
- **Strontium-90 (Bremsstrahlung X-rays):** While a beta emitter, its particles are "braked" by the steel walls, releasing energy as **penetrating X-rays**, effectively turning the cask into a mobile, continuous X-ray machine.

## **2. The Skyshine Hazard: Indirect Atmospheric Exposure**

Beyond direct horizontal rays, the public faces **Skyshine**. This occurs when radiation reflects off the atmosphere and "loops" over buildings and hills. This creates a panoramic field of exposure that is impossible for the public to avoid, even when inside their homes or shielded by local geography.

## **3. The "Main Street" Reality: Engineered Proximity**

Because Canada's highway infrastructure lacks bypasses, these 35-tonne radioactive loads must navigate the very center of our towns.

- **The Social Spine :** In Ontario, the highway is the "Front Street" where motels, eateries with terraces, and major stores are located.
- **The Bottleneck Effect :** Stoplights, turning lanes, and strict speed limits—designed to keep communities safe—will force these casks to idle just meters away from church playgrounds and residential sidewalks.

## **4. Accident Vulnerability: The "Highway of Death"**

The northern route between Sault Ste. Marie and the Revell site relies on a precarious, single-artery infrastructure. Locally known as the **"Highway of Death,"** this stretch of the Trans-Canada is notorious for fatal collisions and day-long closures due to blizzards and ice.

- **The Idling Risk** : When the highway is blocked, nuclear trucks will be trapped in place, creating stationary "hot spots" of radiation in the hearts of our towns for hours or days.
- **Response Limitations** : A nuclear-involved accident would likely close the only available highway for weeks, as specialized cleanup teams must travel from hundreds of kilometres away.

## 5. The Danger of "CRUD": The Mobile Lethal Dust

Scientific data confirms that **CRUD** (Chalk River Unidentified Deposit) is a highly radioactive corrosion layer (iron, nickel, cobalt) present on virtually all fuel bundles.

- **Lethal Mobility** : Unlike solid fuel pellets, CRUD is a brittle, fine powder. In an accident or fire, it "spalls" (flakes off) and becomes an extremely mobile radioactive dust.
- **Contamination** : As a lethal dust, CRUD can be inhaled or washed into Lake Superior and local water systems. It is notoriously difficult to decontaminate, potentially rendering a town's "Main Street" a permanent exclusion zone.

**See my separate submission** - Transportation and CRUD

## 6. Failure of the "Reference Man" Standard

Current safety limits are benchmarked against a **70kg "Reference Man."** As shown in the matrix below, this baseline is a dangerous miscalculation for our sensitive residents.

### Comparative Radiation Risk Matrix (Incident-Free Transport)

*Values represent the **Biological Risk Equivalent** (expressed in "Chest X-ray Units") for 1 hour of exposure to the combined Shine/Skyshine field.*

Population Group	2 Meters	5 Meters	20 Meters	50 Meters*
Reference Man	1.0 (Baseline)	0.16	0.01	0.001
Adult Woman	1.5	0.24	0.015	0.002
Young Boy	4.0	0.64	0.04	0.006
Young Girl	7.0	1.12	0.07	0.011
Baby / Infant	10.0	1.60	0.10	0.016
Pregnant Woman	Dual Risk	High Risk	Elevated Risk	Persistent Risk

\* **Note on 50 Meters:** Per the **Linear No-Threshold (LNT)** model, there is no "safe" dose. Every exposure adds to the lifelong cancer risk of residents.

## 7. Biological Definition of Risks

- **Dual Risk (Highest Priority)** : The compound hazard to a **pregnant woman**. She faces her own **1.5x higher** cancer risk alongside the extreme sensitivity of the **fetus** (estimated at **10x higher** than the Reference Man).
- **High Risk** : Impact **4 to 10 times greater** than the Reference Man. When a truck idles at a light next to a sidewalk, a child receives a medical-grade radiation dose that would be strictly avoided in any clinical setting.

## 8. Conclusion and Demand for Action

The "safe" limits touted by industry are based on the most resilient members of society, not the most vulnerable. I demand that the IAAC move away from "Reference Man" benchmarks and adopt a **"Most Vulnerable Person"** standard (pregnant women and children) for all assessments. We cannot allow nuclear waste to be moved through our towns under a false premise of safety.

### Scientific Foundations:

- National Academy of Sciences BEIR VII Report
- [ICRP Publication 103](#)
- [CNSC: Health Effects of Radiation](#)

Respectfully submitted,  
Robert Irwin