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ENVIRONMENT CANADA'S PRESENTATION ON DEZE ENERGY CORPORATION'S TALTSON HYDROELECTRIC EXPANSION PROJECT

**Public Hearing in Dettah, NT
Lisa Perry, Myra Robertson &
Dave Fox
January 14-15, 2010**

Overview

- Environment Canada's Responsibilities
- Comments & Recommendations regarding:
 - Water Quality
 - Species at Risk
 - Migratory Birds
 - Waste Management - Incineration



Responsibilities

- The primary legislation and standards administered or adhered to by EC, and of particular applicability to the project proposal are:
 - *Department of the Environment Act*
 - *Canadian Environmental Protection Act 1999* & its Regulations
 - *Migratory Birds Convention Act* & its Regulations
 - *Species at Risk Act*
 - *Fisheries Act: Pollution Prevention Provisions*
 - Canadian-wide Standards for Dioxins & Furans

Water Quality – Acid Rock Drainage

- Acid Base Accounting testing conducted to date classified the rock samples as non-acid generating.
- EC recommends:
 - Sampling of drill-hole cores before blasting to confirm test results and monitor rock excavation works;
 - Conducting kinetic or leach testing on the rock to ensure rock will not leach contaminants;
 - Development of a Metal Leaching & Acid Rock Drainage Management Plan; and
 - Including proposed monitoring of rock excavation in the Environmental Monitoring Program.

Water Quality – Explosives & Blasting Residue

- Nitrate & ammonia are commonly associated with blasting residues (e.g. ANFO explosives).
- Blasting residue has the potential to be toxic to aquatic life.
- EC recommends:
 - Following DFOs *Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters*; including not using ANFO mixtures in or near water;
 - Development of a Drill & Blast Management Plan; and
 - Regulating ammonia & nitrate to protect aquatic life.

Water Quality – Monitoring

- A comprehensive Aquatic Effects Monitoring Program (AEMP) expanded from the Draft Environmental Monitoring Program's water sections is needed.
- EC recommends:
 - Development of an AEMP, in consultation with stakeholders;
 - Ensuring natural spatial & temporal variability in the system is characterized before construction begins; and
 - >1 year of baseline data collection (e.g. dissolved oxygen measurements, benthics).

Water Quality – Mercury Monitoring

- Proponent has proposed to conduct sediment monitoring for mercury (Hg).
- EC recommends:
 - Monitoring of sediments for Hg be conducted prior to construction to ensure baseline conditions are understood, and during operations to verify impact predictions;
 - Appropriate methods be utilized to ensure any increase in Hg is detected early; and
 - Analyzing surficial layers.

Species at Risk – Horned Grebes

- Horned Grebe are newly assessed as Special Concern.
- EC recommends:
 - mitigation measures be developed to avoid or lessen all potential adverse effects to Horned Grebes.
 - monitoring be undertaken by the Proponent to determine the effectiveness of mitigation and/or identify where further mitigation is required.
- Details of all mitigation measures and monitoring for Horned Grebes should be developed prior to the start of construction for the project.

Species at Risk – Yellow Rails

- Yellow Rail are listed as Special Concern.
- The Yellow Rail surveys done were not adequate.
- EC recommends that additional Yellow Rail surveys be done prior to construction of the project in the areas likely to have Yellow Rail.
- If Yellow Rails are detected, the Proponent should work with EC to determine appropriate mitigation and monitoring measures.
- The Proponent should consult with EC prior to conducting the surveys to ensure that they have the best information on the Yellow Rail range in the NWT.

Migratory Birds – Annual Outages

- Section 6(a) of the *Migratory Birds Regulations* states that no one shall disturb or destroy the nests or eggs of migratory birds.
- If outages are scheduled during the nesting season, there is a risk that nests could be disturbed or destroyed by any changes in flow rates/water levels during the outage.
- EC recommends that scheduled outages be done prior to May 7, unless local baseline data on migratory birds in the area indicates that these outages could be done later without disturbing or destroying nests or eggs of migratory birds.

Migratory Birds – Collisions

- The Proponent did not assess the risk of migrating waterfowl colliding with the transmission line.
- If large flocks of migrating waterfowl are staging (i.e. resting and feeding) in the area, this could greatly increase the collision risk.
- EC recommends that the Proponent undertake a spring and fall survey of potential wetlands/lakes along the transmission line route to determine if large flocks of birds are staging near the line.
- If areas along the transmission line have significant numbers of waterfowl during spring or fall migration, the Proponent should assess whether further mitigation and monitoring measures are required to minimize the impact of collisions.

Migratory Birds – Ravens & Predators

- Ravens and some raptors are predators of eggs and chicks, and increases in these predator populations have resulted in declines in local bird populations.
- A combination of poor waste management practices from other developments and an increase in potential nest sites from the Taltson transmission line could artificially increase the numbers of predators in the region.
- EC recommends that the numbers and locations of raven and raptor nests on transmission towers be recorded annually. If the number exceeds a pre-established threshold, the Proponent should undertake further mitigation measures to discourage further nesting on the transmissions towers.

Waste Management – Incineration

- Proper incineration can be an effective and environmentally sound method of waste disposal in remote locations
- Proper incineration is neither cheap nor easy.
 - Appropriate equipment must be used; and
 - Must be operated correctly



Incineration Emissions

- Poor equipment and operation can lead to the emission of:
 - Persistence Organic Pollutants (POPs – e.g. dioxins and furans)
 - PAHs (e.g. Benzene)
 - Metals (e.g. Mercury)
 - Criteria Air Contaminants (e.g. Particulate matter)
 - Others



Dioxins & Furans

- Product of incomplete combustion
 - Organic matter + chlorine
- Incineration of Municipal Solid Waste (MSW) is the largest source in Canada
- Persistent in the environment
- Bioaccumulate
- Toxic

Canada-Wide Standards (CWS)

- Canada-wide Standards for Dioxins and Furans
- Canada-wide Standards for Mercury Emissions
 - Canada and GNWT are signatories
- CWS focus on:
 - Emission limits for incineration
 - Demonstration through:
 - Determined efforts
 - Stack testing



Technical Document for Batch Waste Incineration

- Achieve the CWS by:
 - Using appropriate incineration equipment, and
 - Best management practices

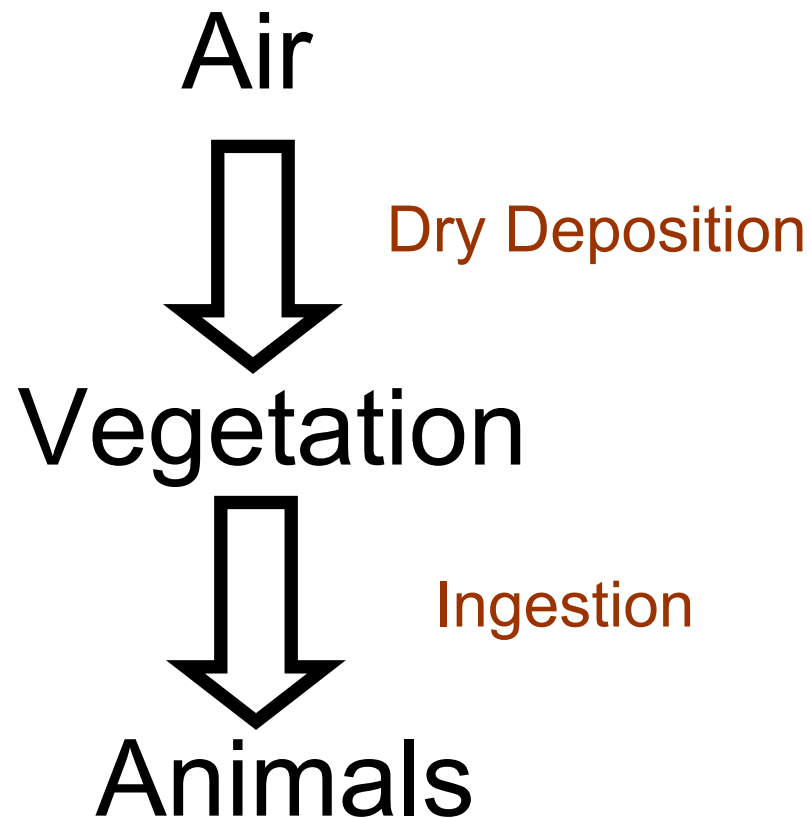
➔ “Determined Efforts”
- Provide consistent advice for incineration management



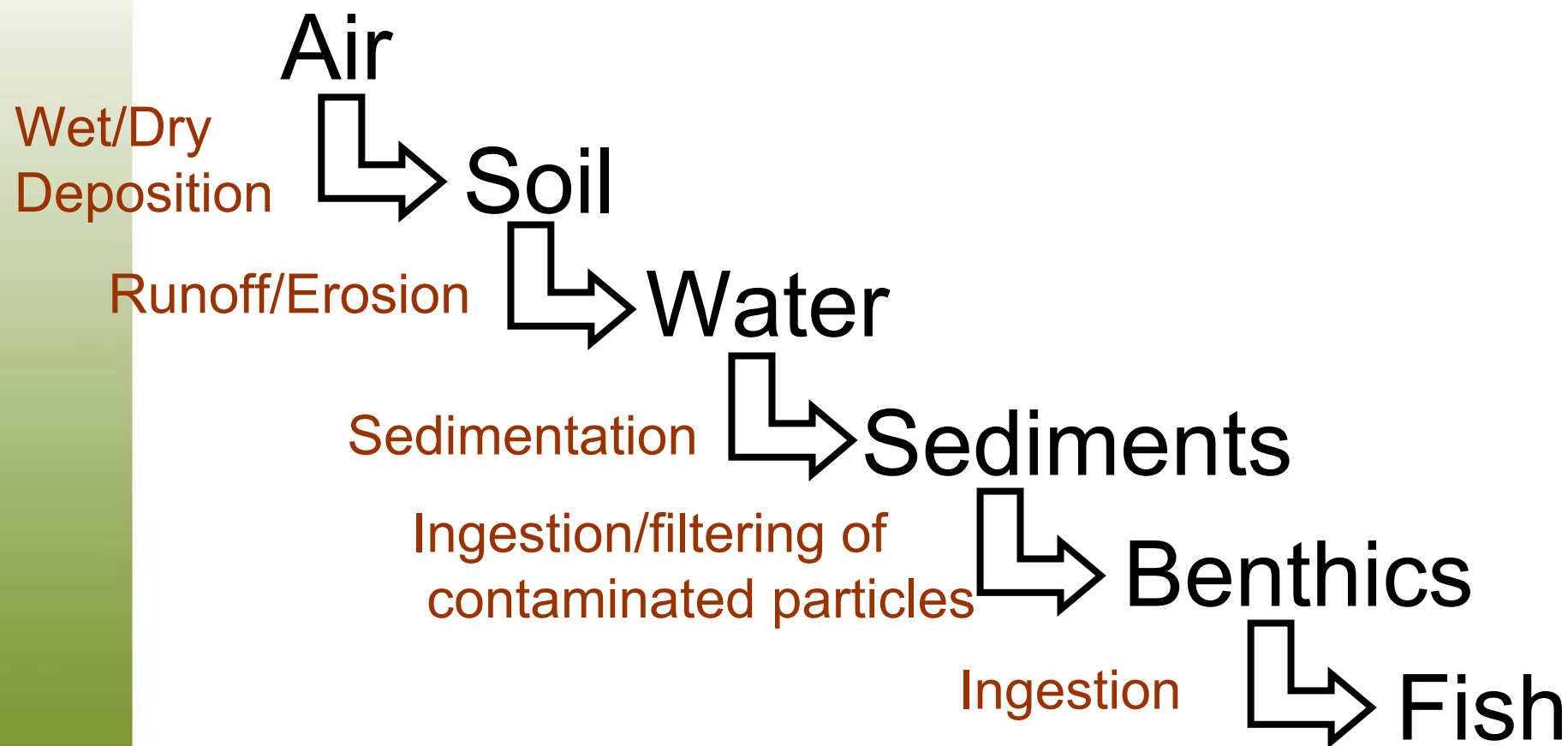
Environmental Fate of Incineration Contaminants

- Incineration is not solely an air quality issue
- Dominant exposure pathways for incineration contaminants are:
 - Sediments;
 - Water column;
 - Vegetation; and
 - Soil.

Environmental Fate: Terrestrial

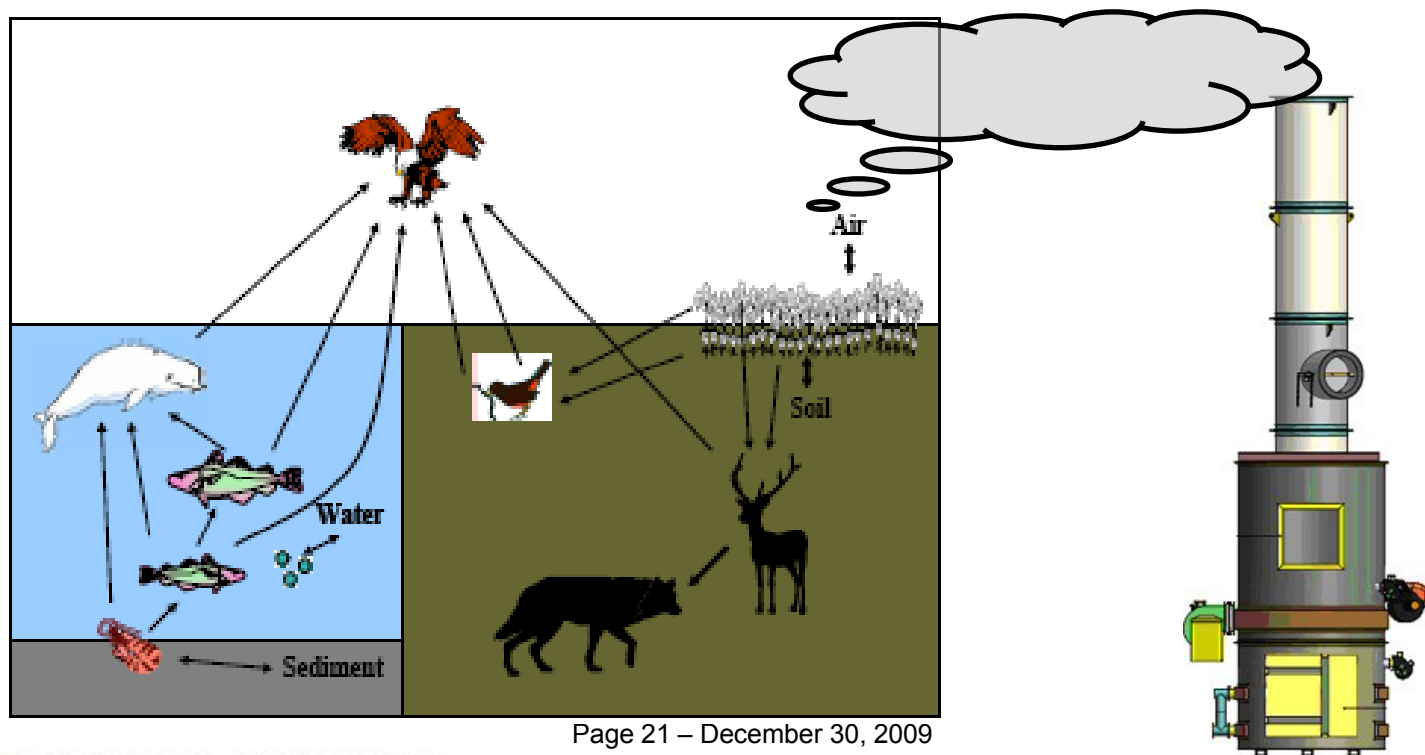


Environmental Fate: Aquatic



Environmental Fate: Modelling

Trent University modelled incineration emissions from a typical northern camp through the food chain.

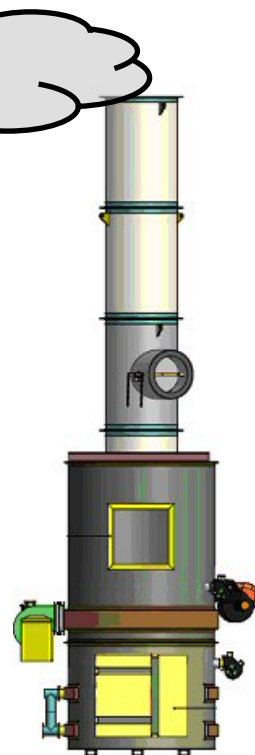


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Environmental Fate: Modelling

Trent University modelled incineration emissions from a typical northern camp through the food chain.

Model Results

- Good incineration – achieves CWS
 - ➔ Emissions -- **9.5µg TEQ/tonnes MSW** (Chandler)
 - ➔ **adverse impacts are unlikely**
- Poor incineration
 - ➔ Emissions -- **3,500µg TEQ/tonnes MSW** (UNEP)
 - ➔ **potential for adverse impacts to soil, water, fish and wildlife**

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Environmental Fate: Sediment Sampling



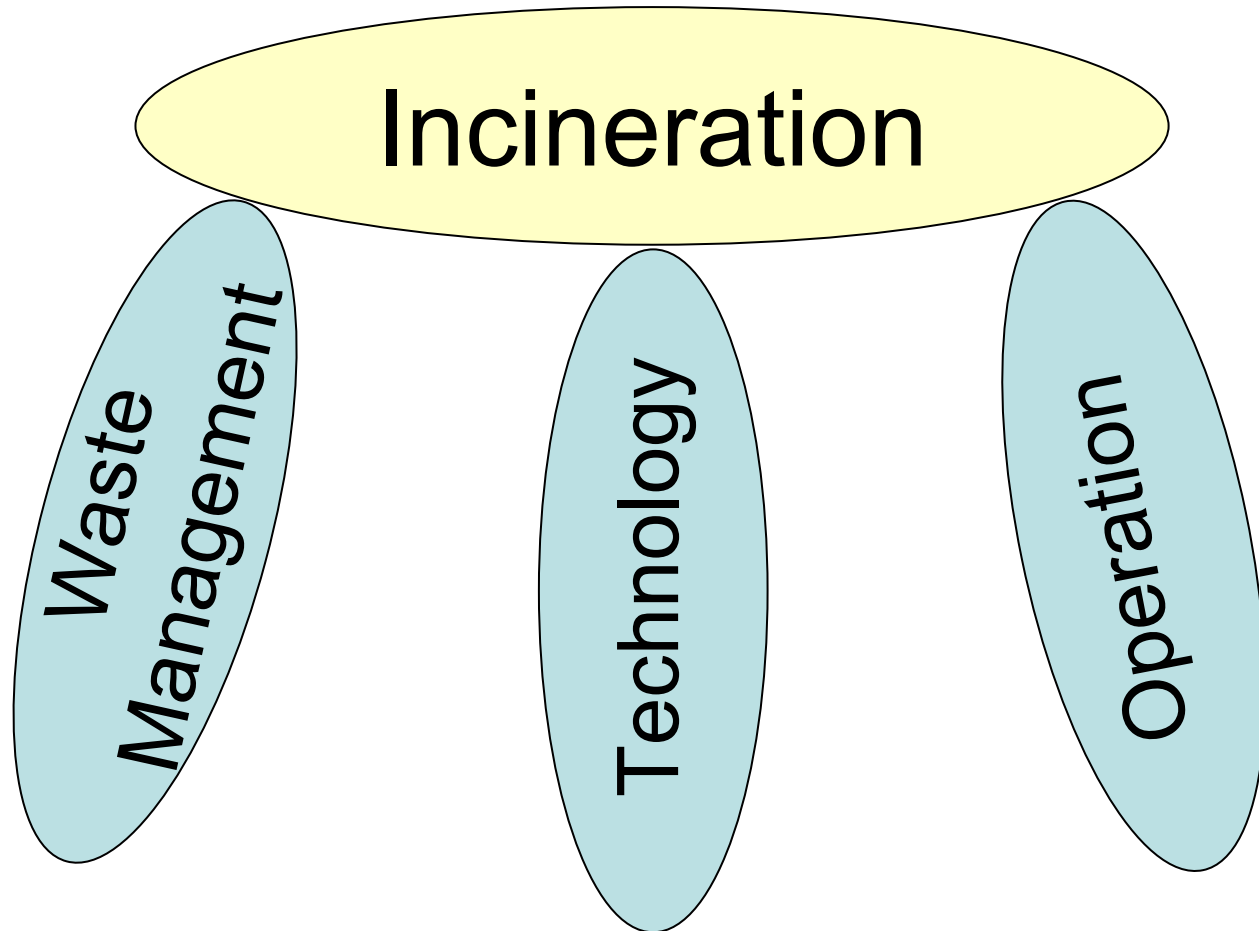
Environmental Fate: Sediment Sampling

- EC collected sediment samples in a target lake near the mine's incinerator and a control lake (25km from incinerator)
- Preliminary Results
 - ➔ Dioxins and furans concentrations in the target lake sediments are 10 times greater than concentrations in the control lake.
 - ➔ Concentrations in the target lake exceed the CCME Interim Freshwater Sediments Quality Guidelines (ISQG) for dioxins and furans

Incineration Management Tools



Fundamentals of Incineration



Technical Document for Batch Waste Incineration: 6-Steps

Step 1: Understand Your Waste Stream

Step 2: Select the Appropriate Incinerator

Step 3: Properly Equip and Install the Incinerator

Step 4: Operate the Incinerator for Optimum Combustion

Step 5: Safely Handle and Dispose Of Incinerator Residues

Step 6: Maintain Records and Reports



Incineration Management Plan

- Recycling/segregation waste program
- Waste audit -- quantities and types of waste to be incinerated
- Selection of incineration technology
- Operational and maintenance records
- Operator training
- Emission measurements
- Incinerator ash disposal
- Annual Report

Recommendation

- Proponent should develop and implement an Incineration Management Plan which incorporates the information provided in the EC Technical Document for Batch Waste Incineration.



Questions?

Environment Canada thanks the Board for the opportunity to present our recommendations on the proposed Taltson Hydroelectric Expansion Project.

We would be happy to take any questions.

