Uranium in Nunavut Review

February 2011

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Introduction

The Government of Nunavut commissioned this report to provide factual information for Nunavummiut to better understand what uranium is, how uranium mining does or does not affect your health, the environment and the economy, along with who is responsible for uranium mining in Nunavut.

What is Uranium?

Uranium is a metal that is common in the Earth's crust, just like copper, lead and zinc and is used for many purposes.

Most uranium mined in the world today is used as fuel for generating electricity in nuclear power plants.

Currently in Canada, uranium is only mined in northern Saskatchewan, although at one time it was also mined in the Northwest Territories (NWT) and Ontario.

Nunavut has many uranium deposits, with most located in the Kivalliq region (Figure 1). Today, there are over 30 areas in Nunavut where companies are exploring uranium deposits and if they find large deposits they will likely want to develop mines.

Figure 1: ***Nunavut Uranium Exploration – Active Projects 2010***

What is Special about Uranium?

All living and non-living things including humans, animals, cars, glass and metals are made up of very small particles called ‘atoms’.

Uranium is a special type of metal because some of its atoms change over time and it becomes a different chemical element (substance). Over billions of years, some uranium atoms change to radium. Radium, in turn, changes to radon, which in a few days changes to other elements and eventually becomes lead.

Some of these changes take millions of years; others happen in a fraction of a second. Some atoms release a burst of energy when they change from one chemical substance to another. Elements that release energy are called radioactive.

A number of types of radiation can be harmful to people and the environment. Some types can easily pass through matter and other types are easily stopped and cannot, for instance, pass through skin or paper.

The effect of radiation on human health is one of the key concerns related to uranium mining and the use of uranium to produce nuclear power. Because of this concern, national and international agencies have been set up to research and regulate activities that are related to radiation exposure and radioactive substances. Uranium can be used to produce nuclear weapons. Canada is one of many countries that are committed to preventing the use of uranium for the production of weapons.

Exposure to Radiation

Everyone has some exposure to radiation from natural sources including the sun and the earth. An average Canadian adult receives a large proportion of their radiation from medical procedures, such as x-rays (Figure 2).

Radon is an odourless, colourless radioactive gas which is produced when uranium decays. Radon that is released in the ground is naturally occurring and everyone can be exposed throughout their lifetime. Radon can also be released during mining.

Naturally-occurring radon provides about one-third of the radiation exposure received by the average Canadian. Radiation from outer space, mostly from the sun, is another natural source. People who fly in planes or live at high altitudes are naturally exposed to more radiation. Another way that people are exposed to radiation is through the food they eat. Some radioactive materials can enter the food chain through plants and animals.

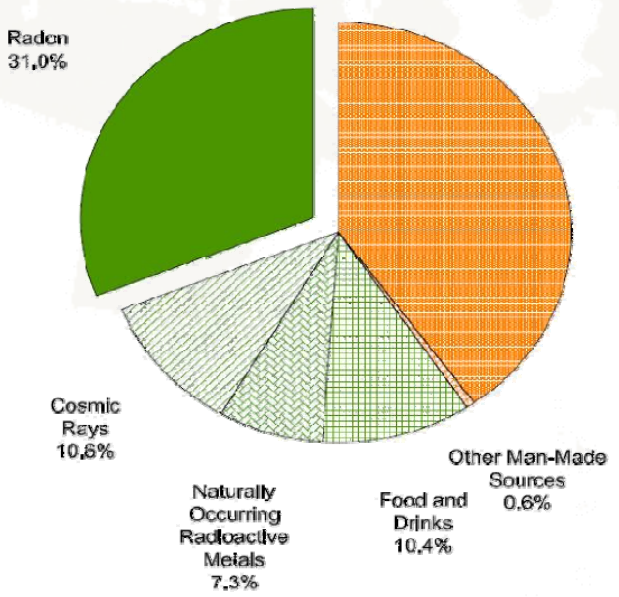

Figure 2: ***Sources of Radiation Exposure for the Average Adult Canadian***
(from Canadian Nuclear Safety Commission 2010)

Radiation Exposure to Humans

Long-term exposure to elevated levels of radon gas increases the risk of lung cancer.

From the 1930s to 1950s, underground uranium workers developed lung cancer at higher-than-normal rates because they had exposure to high concentrations of radon in the mines. Miners who smoked were more affected. After discovering this, industry practices changed and regulatory standards were developed that require companies to protect their workers from radon and radiation.

Measures that are now used to protect uranium miners include:

- Mines are built with ventilation systems that control radon gas concentrations in the air inside the mine and vent it to the outside where it is mixed with clean air that reduces it to safe levels.
- Containment systems are in place that prevent radon from being released into the air; and
- Radon gas levels are monitored at all times in work areas and kept to levels that are safe for workers.

Workers' exposure to radiation is limited by keeping workers at a distance from radioactive materials, by using protective barriers and by limiting the amount of time they are exposed while working.

Although everyone is exposed to radiation from natural sources, federal rules and regulations are in place to ensure the public is protected from human-made radiation exposure. The federal government regulates the transport of uranium and other radioactive materials. It also regulates uranium mines to make sure that radioactive substances are not released to the environment, the food chain or water supply.

Uranium Mining Canadian History & Regulatory Control

In 1933, the first uranium mine was set up in Canada in Port Radium, NWT. This mine produced radium; however uranium was thrown out as a waste product.

In the late 1940s and 1950s, uranium deposits were discovered and mined in Ontario and northern Saskatchewan. Uranium is still mined in northern Saskatchewan, and Canada is one of the world's leading uranium producers.

Workplace safety regulations were not in place when mines first started operating. Early mining workers in Canada were exposed to radioactivity and other hazards such as dusty air and industrial accidents. Federal and territorial governments now have many regulations to protect the environment and to reduce workplace exposure to hazards. Workers' exposure to radiation is controlled so that the risks they face are the same as risks faced by miners in any other mine.

Mine operators must provide protection of the environment. Many things are done to protect the environment, including water treatment and other control measures to prevent the pollution of lakes and streams. When mining operations are finished, sites are properly closed and cleaned-up.

Human health, safety, and the environment are now better protected because there are regulatory requirements and industry standards in place.

The Role of the Federal Government

Uranium mines are the responsibility of, and licensed by, the federal government.

The Canadian Nuclear Safety Commission (CNSC) is the federal agency that enforces the Nuclear Safety and Control Act. This Act applies to uranium mining, processing, and closing of mines.

Anyone wishing to construct, operate or close a uranium mine must apply to the CNSC for permission, and must meet many requirements to protect workers, the public and the environment. The Nuclear Safety and Control Act also regulates the use of radioactive materials and nuclear energy to protect people's health, safety, security and the environment. The CNSC also oversees Canada's international commitments on the peaceful use of nuclear energy.

Because uranium is radioactive and can be used to produce nuclear weapons, it is subject to international agreements. The International Atomic Energy Agency (IAEA) is an independent agency that reports to the United Nations. The IAEA develops standards to protect human health and the environment from the effects of radiation. Countries, including Canada, that are part of IAEA have agreements that uranium cannot be used to produce weapons

In addition to the Nuclear Safety and Control Act, a variety of other federal legislation and regulations keep people and the environment protected during mining activities. Some of these include: the Arctic Waters Pollution Prevention Act, the Canada Labour Code, the Canadian Environmental Protection Act, the Canadian Environmental Assessment Act, Navigable Waters Protection Act, Migratory Birds Convention Act, Canada Wildlife Act and the Fisheries Act.

In 2009, Environment Canada published The Environmental Code of Practice for Metal Mines to provide specific guidance for waste waters from metal mines, including uranium, and other impacts on the environment.

The Government of Canada administers Crown land in Nunavut through Indian and Northern Affairs Canada (INAC). Eighty per cent of Nunavut is Crown land. Companies proposing uranium explorations or mining must receive land use permits from INAC.

The Role of the Government of Nunavut

The Government of Nunavut also has laws that regulate mine development. These laws also protect human and environmental health and safety. This legislation includes the Environmental Protection Act, the Commissioners Lands Act, the Nunavut Wildlife Act and the Nunavut Waters and Surface Rights Tribunal Act.

The Workers' Safety and Compensation Commission for Nunavut protects mine workers' safety by administering the Mine Health and Safety Act and the Mine Health and Safety Regulations.

The Government of Nunavut administers Commissioners land which generally includes lands within community boundaries.

In 2007 the Government of Nunavut developed six principles to address uranium-related development.

Under these principles the Government of Nunavut:

- Regards mining, including uranium mining, as an important potential source of revenues to meet the needs of Nunavut's growing population and also as a potential source of employment and associated skills development for Nunavummiut.

- Recognizes that uranium development places special responsibilities on government because of the nature of uranium and its by-products, the history of its use for both peaceful and non-peaceful purposes, and its potential risks to human health and the environment.

- Understands that uranium development must have the support of Nunavummiut, especially in communities close to uranium development.

- Will support uranium development in Nunavut provided that the following conditions are satisfied:
    - Health and safety standards that are at least at Canada's national standard must be assured for workers involved in uranium development in Nunavut;
    - Environmental standards must be assured, especially for the land, water and wildlife;
    - Nunavummiut must be the major beneficiaries of uranium development activities.

- Believes that nuclear power generation will be an important part of global strategies for ensuring energy supplies while reducing reliance on greenhouse gas-emitting fossil fuels.

- Believes that Canadian law and international agreements provide a reasonable level of assurance that uranium mined in Nunavut will be used for peaceful purposes.

The Role of Organizations established under the Nunavut Land Claim Agreement

The *Nunavut Land Claim Agreement (*NLCA) is an agreement between the Inuit of the Nunavut Settlement Area, then part of the NWT, and the federal government. This agreement was the basis for creating the new territory of Nunavut in 1999. The NLCA gave title to Inuit Owned Lands and established a public government to serve the territory.

Nunavut Tunngavik Incorporated (NTI) is the Inuit-owned corporation responsible for overseeing the NLCA. NTI holds the mineral rights to Inuit Owned Lands in Nunavut. Eighteen per cent of Nunavut is Inuit Owned Land. NTI promotes mineral rights and enters into financial agreements with explorations and mining companies.

In 2007, NTI adopted the *"Policy Concerning Uranium Mining in Nunavut"*. The guiding principle of this policy is:

> ***Uranium exploration and mining must be carried out in an environmentally and socially responsible way and the uranium that results from the mining shall be used only for peaceful and environmentally friendly purposes.***

In accordance with this principle, NTI established the following objectives:

1. **Support Responsible and Peaceful Uses of Nuclear Energy**
   Nuclear energy will be used for peaceful and environmentally responsible purposes.

2. **Require Benefits from Uranium Exploration and Mining** Uranium exploration and mining in Nunavut will bring significant economic benefits to Inuit.

3. **Ensure Protection of Human Health**
   Uranium exploration and mining will be carried out in a manner that protects the health and safety of the workers and of all Nunavummiut.

4. Limit Impacts of Uranium Exploration and Mining

Uranium exploration and mining will be carried out in a manner that will not cause significant adverse effects on people, the environment or wildlife.

5. Promote Participation of Inuit

The NLCA established Institutions of Public Government with responsibilities in Nunavut, these include:

- The Nunavut Planning Commission (NPC) makes sure that project applications conform to approved Land Use Plans.

- The Nunavut Impact Review Board (NIRB) reviews permit applications from companies that plan development activities, including uranium mines. NIRB evaluates potential environmental and socio-economic impacts of proposed development prior to permit approval from the required agencies. Using both traditional knowledge and scientific methods, NIRB recommends which projects can go ahead and under what conditions.

- The Nunavut Water Board regulates and manages inland water use and disposal through issuing water licenses.

- The Nunavut Wildlife Management Board protects and conserves wildlife using traditional Inuit and scientific knowledge.

- The Nunavut Surface Rights Tribunal resolves disputes between government, Inuit organizations and industry.

- There are three Regional Inuit Associations — the Kivalliq Inuit Association, the Kitikmeot Inuit Association and the Qikiqtani Inuit Association. The regional Inuit associations administer access and use of Inuit Owned Lands in their respective regions by issuing land use licenses to companies that plan any development projects in the respective regions. They are supported by NTI and the Nunavut Surface Rights Tribunal.

An Inuit Impact and Benefit Agreement (IIBA) is required when a major development project is undertaken near Inuit Owned Land.

Uranium Development

Uranium mining consists of a number of steps:

- **Exploration** – samples of surface and drilled rock are taken from the ground to see if there is enough uranium to be mined.

- **Mining operations** – Uranium is mined by '*open pit mining*' or '*underground mining'.* In either case the top layer of earth and waste rock that does not have a high enough concentration of uranium is removed to allow access to the uranium bearing rock. The waste rock is typically left at the mine site. Mine rock drainage can contaminate water around the mine. This is caused when some types of waste rock are exposed to the air and come into contact with water. Sometimes, the waste rock can generate acid. To prevent impacts to water quality, the waste rock may be placed back into a mine pit, or stored underwater. If placed in piles on the ground, special measures are taken to prevent water from dissolving some of the rock and then passing into nearby streams or lakes. The uranium is processed in a mill.

- **Milling and processing** – At the mill, the ore is crushed and chemically processed to separate the uranium from the rock so it can be concentrated into a product called '*yellowcake'.* The main waste from this process is called '*tailings'.* Tailings are a mix of ground-up rock, water and some remaining process chemicals. Tailings are placed into specially designed management facilities. Where possible, tailings may be returned to pits that have been designed and built to make sure the tailings are safely contained for the long term. The water that drains from tailings can impact nearby streams and lakes, and usually requires treatment before it can be released. Uranium tailings from the mill can be radioactive and may also release radon. Tailings management facilities must be designed to protect the workers and the environment from this radiation.

- **Transportation:** The yellowcake is shipped to processing plants where most of it is used to create fuel for nuclear reactors which operate to produce electricity. Some uranium is also used to create medical isotopes for medical purposes.

Possible Effects of Uranium Mining on the Environment

The possible effects of uranium mining on the environment are similar to those of other types of metal mining. And like other types of mining, many improvements have been made to the mining and milling processes to increase environmental protection.

One of the most important environmental changes is that mines are now required to prevent contaminated water from polluting nearby lakes and streams. A second change is that before mining can even begin, companies must have a plan for how the mine will eventually be closed, and also set aside money to pay for site clean-up.

Before mining begins, companies conduct field surveys to assess the area prior to development. This provides baseline data. These field surveys can provide useful information on wildlife, birds, fish, vegetation, and the ecology of streams and lakes. This information is used to assess the project so that the effects on the environment are understood prior to the mining work beginning. Environmental monitoring done before, during and after mining can provide information about permafrost conditions, soils, water quality, contaminants and much more. In Nunavut, the information from such field surveys and monitoring can contribute to our knowledge about the environment.

Possible Effects on Air Quality

Air quality could be affected by a uranium mining project through the release of radon, dust and other typical pollutants such as increased vehicle exhaust. The sources of these air pollutants vary from physical ground disturbances, such as drilling, to vehicle operation to tailings deposits. The potential impact on air quality forms part of the environmental assessment that must be conducted before a mine can be constructed and operated.

Possible Effects on Land and Wildlife

Soil and Permafrost - The stability of the ground and permafrost characteristics may be affected by mining activities. The actual effects will vary, depending on the specific project and its location. Terrain and soil disturbance can occur at the mine site and from other locations where rock and gravel is taken to be used for construction material. Where buildings and roads are constructed, fill layers will be used to cover and protect permafrost and this process will destroy the soil and tundra that is covered. Spills of hazardous materials must be cleaned up immediately to reduce potential impacts on soils.

Project activities such as roads and airstrips on the tundra, and underground mining can result in ground erosion and permafrost thaw.

Vegetation - Vegetation can be impacted by mining activities. Direct effects would occur where project components such as roads, airstrips or construction sites are located. Indirect effects of mining operations to vegetation could happen if the mine or roads create dust that settles on vegetation, or if the soil moisture conditions are changed because water has been diverted or drained from an area. Spills of hazardous materials must be cleaned up immediately to reduce potential impacts on vegetation.

Wildlife - Mining projects can affect wildlife, fish and birds in a number of ways. The mine can alter some of the places where animals live, feed or travel. Wildlife can be disturbed by activity and noise at the mine. Animals must be protected from toxic chemicals used at the mine site. Any of these reasons may reduce the number of young that animals can produce. Wildlife can also be killed through collisions with vehicles or if a threat to people at a mining camp.

The effects of uranium mining on land and wildlife are similar to the effects of other types of metal mining.

Possible Effects on Water

Mining has the potential to affect streams and lakes near a mine site, as well as downstream from the mining operation and along access routes. These effects can include contaminating water and the soil at the bottom of streams and lakes (sediment), changing drainage patterns, and affecting fish and other organisms that live in the water.

Water that has come into contact with mining operations and that may contain chemicals is the most significant way that uranium mining can affect the environment. Water that has been pumped out of pits or underground tunnels; has been in contact with waste rock, tailings, or hazardous materials; has been used in processing or for the camp; must be managed. Sometimes water must be treated before it can be released into streams and lakes near the mine.

Environmental monitoring is necessary to ensure that the mining operation does not affect water quality and fish while the mine is operating, and after the mine has closed.

The quality of wastewater released to the environment is regulated by both federal government and territorial organizations (e.g., the Nunavut Water Board). The federal *Metal Mining Effluent Regulations* (under the *Fisheries Act*) provide consistent regulations for all Canadian metal mines, including uranium mines. Permit conditions can also demand more stringent conditions if required to protect fish.

Water quality in lakes and streams receiving treated wastewater from mines may be affected. These effects vary depending on the nature of a specific project and can include chemicals such as arsenic and lead, as well as some elements with radioactive properties. These changes are very small, are generally confined to the immediate area of the mine, and have not been found to affect wildlife.

Fish and Fish Habitat - Taking water out of a lake or river, releasing wastewater, and constructing roads or dams are some of the ways mining activities can affect fish and fish habitat and other organisms that live in the water. As a condition of permits, mine projects are required to protect fish and fish habitat, or provide compensation by developing new habitat elsewhere.

Groundwater - Groundwater is the water that flows beneath the ground surface. It can be affected by drainage from waste rock, tailings areas and other mine activities if the water from these areas is not collected and treated.

Marine Environment - Marine environments could be impacted through increased barge traffic if uranium is shipped along ocean routes to the places where it is processed. There is an increased risk of accidents that may result in hazardous spills and subsequent impact of marine water and sediment quality. Any contamination of water and sediment could affect marine organisms and fish. Dredging to make a channel deeper for larger ships, or ships running aground could affect fish eggs and therefore marine fish populations. Noise from shipping activities can also affect fish and marine wildlife health, reproduction or alter migration and feeding patterns. Wildlife injury and death could result from collisions with vessels. Accidental hazardous material spills can also threaten wildlife health. Marine shipping is regulated and if uranium is shipped along ocean routes it will have to comply with federal transport regulations.

Managing water that comes into contact with mine operations is a key feature of a uranium mine design, operation, and closure plan. Before water from a mine project is released into the environment it must meet standards to protect the environment. Regulations for a number of chemicals, including those from uranium mines, are in place and can be included as conditions on permits and licenses.

Possible Effects of Uranium Mining on Human Health

Uranium occurs naturally in rocks and soil. In some locations, water may naturally contain levels of uranium that are higher than the standards that have been established to protect human health.

Wastewater treatment at uranium mines, however, prevents unnaturally high levels of uranium from being released by a mining project. Monitoring programs measure these levels regularly to make sure the treatment is effective.

Human health concerns surrounding uranium mining activities include increased direct exposure to radiation and indirect exposure by drinking contaminated water or eating contaminated fish and wildlife.

Radon is one of the substances formed in uranium deposits. It is a gas that, in high concentrations, can be bad for miners' health. Modern uranium mines have special ventilation systems to make sure that miners are not exposed to high radon levels. Miners' exposure to other types of radiation is carefully controlled so that it does not cause an unacceptable increased risk to workers.

The potential effects of radiation and other chemicals from tailings are of higher concern because they present a risk to the environment and humans that lasts for many centuries. The design of safe places to store tailings forever is a key feature of uranium mines. Tailings are placed in specially-designed pits or underground spaces, or covered with rock and soil material. These features prevent the environment from being exposed to unnaturally high levels of radiation. They prevent water from becoming contaminated, and prevent wildlife from being exposed to radiation.

Studies done at sites of decommissioned uranium mines in Canada show that eating animals and plants that live near these sites does not present a risk to human health.

Scientists understand and know a lot about radon and the radiation that comes from uranium and it can be measured accurately.

Possible Effects of Uranium Mining on Socio-economics

The socioeconomic effects of uranium mining are the same as those for mining other materials. Increased incomes from the mining sector can have both positive and negative effects on the individual, family and community.

Resource development in the Arctic regions of Canada can bring money, work, and the potential for Inuit to be more self-sufficient. It also has the potential to cause negative impacts and disruptions to community well-being. The challenge in all mining is to develop, nurture and balance a wage-earner economy while protecting the values of the traditional economy and lifestyle.

Mining projects can bring substantial employment opportunities to northern communities, as shown by the recent diamond mining activity in NWT and the uranium mining industry in northern Saskatchewan. Employment, education and business opportunities associated with mining activities can increase the income levels of individuals, families and communities, in-turn stimulating local economies. However, increased income can also increase the potential for social problems such as substance abuse and gambling.

The mining sector often uses two-week rotational schedules for its workers, which means employees are away from their home and community for long periods of time. These extended shifts can cause family stress and can mean less time for traditional ways of life.

Communities may have more people living in them due to mining activities and existing services could become overwhelmed as a result of increased demands for such things as health services, policing, education and housing, electrical systems and recreational facilities. These services might need to be expanded and local government organizations (e.g., regional offices of Government of Nunavut departments and Regional Inuit Associations) may also expand to administer these services.

Mining activities bring a demand for a variety of goods and services which can bring business to local communities. The mining sector could be a larger contributor to Nunavut's economy. Nunavut may benefit from fees and royalties generated from mining, currently those funds would be

collected by the Government of Canada. The Territory can also collect tax payments for local and regional governments, and NTI can collect payments from exploration and mining companies working on Inuit Owned Lands.

The Government of Nunavut and Nunavut Arctic College are already working together to introduce more mining-related trades training programs. Mining operators in Nunavut are expected to have project-specific education and training programs available to their workers.

Mining activities have the potential to attract workers from outside the local communities. These people may bring influences and attitudes that have the potential to negatively impact community life and traditional ways of living.

Mining projects, including uranium mining projects, could result in the expansion of Nunavut's transportation system in communities around the mines or on transportation routes. This can include the development of new or improved all-weather roads, winter roads, ports, airstrips and airports. These Infrastructure improvements can result in reduced transportation costs for fuel and supplies for Nunavummiut, reduced operating costs for future development projects, increased employment, training, and business opportunities, and increased economic activities and tax revenues if the improved infrastructure attracts other businesses.

Possible Effects of Uranium Mining on Cultural Heritage Resources

Cultural heritage resources of Inuit include archaeological sites and artifacts, traditional activities and traditional knowledge or Inuit Qaujimajatuqangit (IQ). Heritage resource studies must be done prior to mining and can lead to the discovery, documentation and preservation of archaeological and culturally significant sites. However, ground disturbance by exploration and mining activities can also destroy archaeological sites.

In other northern areas, people who worked for a wage continue to hunt and fish. However, if mining activities harm wildlife or fish, this can negatively impact traditional activities such as hunting and fishing. The importance of IQ as a cultural heritage resource could potentially decrease if young Inuit who take jobs in mines lose interest in acquiring IQ.

Decommissioning of Uranium Mines

The decommissioning or closing of a mine is an important stage of a uranium mine's life. As part of the permit process of a mining development a company must have a plan in place and enough money set aside to pay for the proper decommissioning and clean-up of the mine.

The clean-up includes removing the surface buildings and making sure that any water that could be affected by waste rock or tailings is properly treated before being released to the environment. Because the tailings from uranium mines will remain radioactive for hundreds of thousands of years, special methods must be used to prevent chemicals from being released into the environment.

Depending on the design of the mine, it may include burying the tailings under layers of soil or placing them under water to control the amount of radiation that is emitted into the environment. If the waste rock is a threat to the environment, similar actions may be required.

The site must be monitored for the long-term to be certain that releases of any radioactive materials and other harmful substances are controlled well into the future and there are safety plans in place to deal with any future changes. The Nuclear Safety and Control Act requires that the decommissioning of uranium mines is subject to special approvals.

Nuclear Power Generation

Nunavut does not have immediate plans to consider nuclear power as an electricity generation option however it could potentially be part of Nunavut's future energy supply. This will have to be carefully weighed against the other options such as wind, solar and hydro power.

Today, most of the world's mined uranium is used to produce electricity in nuclear power plants. This form of power generation is preferred in many countries because it produces smaller amounts of greenhouse gases and other air pollutants than other methods of producing electricity such as coal-fired electricity generating stations.

Greenhouse gases are gases in the atmosphere that reduce the amount of heat that can escape from the Earth into space. Burning fossil fuels, such as coal, oil and gas create larger amounts of greenhouse gases. As greenhouse gases increase, more heat is trapped by the Earth and global climate change will be the outcome.

About 15% of Canada's electricity is now generated from nuclear power plants. Some places like British Columbia do not allow the use of nuclear power, but Ontario generates about 50% of its electricity from nuclear reactors.

The main challenge to nuclear power generation is the disposal of the used nuclear fuel. This used nuclear fuel remains highly radioactive for many centuries. In Canada, used nuclear fuel is now stored at the nuclear power plants where the fuel was used. In the long term, this material will be placed in deep underground caverns. Viable and safe long term storage solutions are being actively studied around the world.

Glossary

atom	a very, very small particle that forms the basic building block of all matter
baseline data	data that is collected about the environment before a project begins
CNSC	Canadian Nuclear Safety Commission, a federal government organization responsible for regulating all aspects of the nuclear industry in Canada
cosmic radiation	radiation that comes from outer space, mostly from the sun
decommissioning	the process of removing surface facilities and restoring a mine site after mining has been completed
IAEA	International Atomic Energy Agency, an independent organization of the United Nations, which deals with the use of nuclear energy for peaceful purposes
INAC	Indian and Northern Affairs Canada
Inuit Owned Lands	Lands held under title by the Inuit, as established by the Nunavut Land Claim Agreement. Title may be for the surface only, or may also include subsurface (i.e., mineral rights).
IQ	Inuit Qaujimajatuqangit: Inuit traditional knowledge
ionizing radiation	energy released from an atom that has the ability to affect the structure of other atoms

milling and processing	the process used to remove uranium from ore in a processing plant
mine rock drainage	water that drains through rock produced during mining operations; depending on the type of rock, this water may contain concentrations of chemicals that are harmful to the environment
NIRB	Nunavut Impact Review Board
NLCA	Nunavut Land Claim Agreement
NTI	Nunavut Tunngavik Incorporated: an Inuit-owned corporation responsible for overseeing the implementation of the Nunavut Land Claim Agreement.
nuclear power	electricity that is generated by the controlled reaction of uranium in a nuclear reactor
Nuclear Safety and Control Act	the federal legislation that controls all activities related to nuclear materials in Canada, including uranium mining
NWT	Northwest Territories
open pit mining	a mining technique where ore is removed from a pit that is open to the surface
overburden	a layer of soil and rock that covers a deposit of ore, and that must be removed to allow surface mining to occur
radioactive	elements that release ionizing radiation are called radioactive

radon	a naturally occurring gas that is often associated with uranium deposits, and can be harmful to human health in high concentrations
tailings	a mix of ground-up rock, water and some remaining process chemicals, which is the waste product of a uranium mill
underground mining	a mining technique where the ore is dug out of deep underground tunnels; the underground mine is accessed either by shafts or by ramps extending down from the surface
waste rock	rock that does not have a high enough concentration of uranium to be worth processing
yellowcake	the concentrated uranium product that is produced by a uranium mill

Golder Associates has compiled this information.