



Indian and Northern
Affairs Canada

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et du Nord Canada

STAGES OF MINERAL EXPLORATION & DEVELOPMENT IN THE NORTHWEST TERRITORIES



Canada

WHAT DOES IT COST?

\$1.75 million

A company invests approximately \$1.75 million per project per year. This phase is three to five years.

\$5 million

Approximately \$5 million per project per year is spent at this stage of mineral exploration. This stage may last from 5 to 15 years.

About 1 out of every 200 projects that reaches the discovery stage moves to development. This is equivalent to about 1 out of every 10,000 grassroots exploration projects.

\$1.5 billion

On average, this stage costs approximately \$1.5 billion and may take three years or more years to complete.

It is at this stage that companies start to see a return on their investment (make some money). But they still have expenses (operating costs) such as wages, fuel, transportation, equipment and maintenance in order to keep the mine running.

\$150 million

It typically takes two to ten years, or more, to shut down a mine and clean up the site. This usually costs upwards of \$150 million – depending on the size of the mine and what kind of on-going clean up has been done during the life of the mine.

COMPARE HOW MUCH LAND AREA EACH OF THESE TAKE UP

Hay River – 132.58 sq km*
Yellowknife – 102.38 sq km
Great Bear Lake – 31,328 sq km
Great Slave Lake – 28,568 sq km
Norman Wells – 93.28 sq km
Fort Smith – 92.75 sq km
Fort Simpson – 78.31 sq km

Inuvik – 49.76 sq km
Ekati – 19.5 sq km
Diavik – 7 sq km
Snap Lake – 5.5 sq km
Giant Mine – 5 sq km
West Edmonton Mall – 0.49 sq km

All together Ekati, Diavik and Snap Lake = 32 sq km that is .0000266% of the NWT
1 sq km = 241.11 acres or 100 hectares

* square kilometres (all measures are approximate)

PROSPECTORS LICENCE – required to prospect for minerals, record or acquire a recorded claim or get a lease. The cost is \$5.00 for an individual or \$50.00 for a company and they can be purchased from the Mining Recorder's Office at Indian & Northern Affairs Canada (INAC) in Yellowknife.



PROSPECTING PERMIT – applications are accepted by the Mining Recorder's Office between December 1st and 31st each year. Approved permits are issued effective February 1st of the following year. Permits are good for three years below the 68th parallel and five years above the 68th parallel. These permits cost \$25.00 plus .10 cents an acre. Prospecting permits give the applicant temporary, but exclusive, exploration and staking rights, but not mineral rights which are rights to/ownership of the minerals found in a specific location, for example, within a claim.

STAKING A CLAIM – a person or company needs a valid prospector's licence to stake a claim but doesn't need a prospecting permit. Claim tags for each post (4) on a claim can be purchased for \$2.00 a set from the Mining Recorder's Office (MRO) which also has rules about the size and shape of a claim. Check with the Mining Recorder's Office before staking a claim to make sure the area is available and that it is not already staked, claimed or leased by someone else.

MINERAL CLAIM – a mineral claim must be recorded with the MRO in Yellowknife within 60 days of the date it was staked. To record the claim, paperwork, a sketch of the claim, and fees must be filed with the MRO. A mineral claim

gives the owner rights to the subsurface minerals for up to 10 years if a specific amount of work is done on the claim each year.

MINERAL LEASE – if the required amount of work is done on a claim, a person or company can apply to lease the claim anytime before the 30th day after the 10th anniversary date of the claim. A lease is good for 21 years and may be extended for another 21 years if the rental payments are up-to-date and the renewal fees are paid. If a person or company is going to begin production (construction, mining, milling) then the claim must be taken to lease.



1 PROSPECTING AND EXPLORATION

Prospecting and exploration for precious metals, base metals, minerals and diamonds usually begins with research to select target areas for exploration and taking samples from areas that look like they might have minerals.

BASE METALS are non-precious metals like lead, zinc, copper, nickel, tungsten and others.

PRECIOUS METALS are gold, silver and platinum – there are only three.

Exploration includes prospecting, mapping and surveying, either on the ground or from a plane or helicopter, where special equipment measures the magnetic or electrical properties of rocks on the surface and underground (subsurface). Airborne surveys are done in the winter or spring to gather data for the summer exploration season.

If the information collected from the surveys indicates something out of the ordinary (an anomaly) in specific location on-the-ground work is done.

A prospecting team, normally two people, will visit each anomaly to see if minerals are present on the surface. They then take grab samples (first-sized samples of the mineralized rock) for assay (analysis) to identify and measure the presence of base and/or precious metals.

Other sampling methods include taking rocks, soil, till (gravel), and lake sediment with a sample spacing of hundreds of metres. If analysis indicates there might be something of interest, more closely spaced sampling would be done. This kind of sampling normally takes place on mineral claims staked around the anomalies; smaller parcels of land than those covered by a prospecting permit.

2 DISCOVERY AND ADVANCED EXPLORATION

Discovery and advanced exploration happens when something of value is actually found. At this stage, higher impact activities such as further ground geophysics, channel sampling, trenching and diamond drilling, generally take place. This work is usually conducted on a mineral claim or lease.

It is at this stage where permits, leases and licenses are required and where the project may be referred for environmental assessment.

Very few discovered mineral deposits become producing mines. It may take between 10 to 15 years or more for a

mine to be developed. In the North, operation challenges such as limited infrastructure, including roads and power, as well as associated costs such as fuel, transportation, materials and labour, make it much more difficult to move beyond this stage. Most projects never get past this stage.

3 DEVELOPMENT/CONSTRUCTION

Development/construction is next if, based on economics (is an area or deposit worth mining), and if shareholders approve, a company decides to go ahead with the project. During this stage the company raises money in order to begin construction and develop a mine. This is the most expensive phase of the mining cycle.

THRESHOLD LIMITS – certain kinds of work can take place without land use permits and water licences being required. Most of this is low-impact and below threshold limits set by the Mackenzie Valley Land and Water Board.

When determining threshold limits, the following work and activities are considered: the amount of fuel and explosives, the number of working days, the size of buildings, the weight of equipment and vehicles, deposit of waste, direct use of water, water crossings such as roads and bridges and water flow.

If the proposed work and activities are going to be above the threshold limits, land use permits and water licences are required. The applications are reviewed by the appropriate land and water board: Mackenzie Valley Land and Water Board; Gwich'in Land and Water Board; Sahtu Land and Water Board; Wek'ezhii Land and Water Board; Inuvialuit Joint Secretariat. These organizations make the decisions about whether or not to issue a permit or licence. These organizations may also recommend that the project receive an environmental assessment before proceeding or before issuing the permits and licences.



4 OPERATION AND PRODUCTION

Operation and production is the actual mining, milling, and processing of the metal, ore or diamonds. The length of time a mine is in production (the mine life) depends on the amount (reserves) and quality (grade) of the mineral, metal or gems and whether the operation is still profitable.

5 RECLAMATION

Reclamation of a site and protection of the environment starts at the beginning of the project. All existing and new mines in the NWT must have closure and reclamation plans and are required to set aside in a trust, the total estimated reclamation costs. The goal is to protect the environment right from the beginning, to make sure the site is as productive as possible and safe for people and animals when the mine closes.



INAC resource and water inspectors make sure companies and individuals follow the rules of their land use permit and water licence and comply with the various legislation. How often an inspector visits a particular site depends on the activity. For example, when a mine is under construction, inspectors visit every two weeks. For mineral exploration drilling operations, it's twice a season (May – September). If there is a concern about an activity or a possible spill, inspectors will confirm whether or not the activity is authorized or, in the case of a spill go check it out. The primary goal of inspectors is to protect the environment.

WHO DO I CONTACT FOR MORE INFORMATION?

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