Indian and Northern Affairs Canada
Affaires indiennes et du Nord Canada

WHAT'S HAPPENING in the Wek'èezhìi Area?

Contaminated Site Remediation

2010 in Review

About the Contaminants and Remediation Directorate

Indian and Northern Affairs Canada (INAC) recognizes the importance of cleaning up contaminated sites and preventing future contamination. The Contaminants and Remediation Directorate (CARD) in the NWT currently manages over 30 contaminated sites at various stages of remediation. Many of these sites became the Government of Canada's responsibility after private owners relinquished their properties according to the legislation of the day, or when companies went bankrupt. The properties then reverted to the Crown, and as representative of the Crown, INAC became custodian of these properties and related remediation activities.

Canada

This map is intended for general information only. It is neither a technical reference tool, nor a legal document. INAC will not be held liable for any errors or inaccuracies.

10 Step Process

In 1999, the Contaminated Sites Management Working Group (CSMWG) released the document *A Federal Approach to Contaminated Sites* outlining a 10 step process for addressing a federal contaminated site. These guidelines were developed to ensure there would be a common approach to the management of contaminated sites.

For more information on the 10 step process, please visit *www.ainc-inac.gc.ca/ai/scr/nt/cnt/cln/fcsap/fcsap-10/index-eng.asp.*

LEGEND:

- **Assessment Phase** Steps 1 to 7
- **Remediation Phase** Steps 8 and 9
- **Complete / Monitoring** Step 10

1. **Chalco Lake Exploration Site**
2. **Diversified/Indigo Mine**
3. **Indore/Beaverlodge (Hottah) Mines**
4. **Spider Lake**
5. **Colomac Mine**
6. **Rayrock Mine**
7. **North Inca Mine**

Sites in the Wek'èezhìi Area

A number of contaminated sites have been identified and prioritized in the Wek'èezhìi Area, and identification and assessment is on-going. In 2010, approximately 47 potential sites were examined. This work included confirming the location of the site and the site conditions such as any potential contaminants or sources of contamination. This process is followed by a site assessment and a detailed analysis to identify the nature and extent of the contamination.

1 Chalco Lake Exploration Site

The Chalco Lake Exploration Site is located approximately 210 km north of Yellowknife near the Diversified/Indigo Mine. It consists of two former camps, one dating back to the 1940s and another built as a mineral exploration camp in the 1970s.

CONCERNS AT THE SITE

- Structures and materials left behind
- Two small areas of hydrocarbon contamination
- Areas of potential metal-contaminated soil

WORK COMPLETED

2009 Debris removal including a building demolition, burning of clean, combustible materials, and removal of all waste.
2010 Phase II Environmental Site Assessment (ESA) of two small areas of hydrocarbon contamination

FUTURE PLANS

Results from the Phase II work are being reviewed to determine the extent of residual hydrocarbon and metal contamination in soil and what, if any, further remediation is required. ■

2 Diversified/ Indigo Mine

The Diversified/Indigo Mine site is located on Indin Lake, 205 km northeast of Yellowknife. Gold exploration on the site dates back to 1939.

CONCERNS AT THE SITE

- Structures and equipment left at the site
- An unsecured mine opening
- Potential hydrocarbon contamination

WORK COMPLETED

2009 - Phase I Environmental Site Assessment (review of historical records)
2010 - Phase II Environmental Site Assessment (conducting sampling at the site)

FUTURE PLANS

A Phase III ESA is planned, which includes detailed studies of the identified concerns. From the Phase III ESA, remedial options will be selected through input from the Tłı̨chǫ Elders and Executive and then a Remedial Action Plan will be developed. ■

3 Indore/Beaverlodge (Hottah) Mines

The Indore and Beaverlodge (Hottah) Mines are located 12 km apart on Hottah Lake, approximately 100 km north of Gamètì. Indore Mine was originally staked for uranium exploration in 1950, and operated off and on until it closed in 1956. Beaverlodge (Hottah) Mine is a former uranium mine which had various owners between 1943 and 1977, after which responsibility reverted to the Crown.

CONCERNS AT INDORE MINE SITE

- Small quantity of tailings remaining on land
- Unconfirmed underwater tailings
- Slightly elevated radioactive waste rock and sediment
- Unsecured mine openings, including a mine shaft and adit
- Remains of buildings and dumpsites
- Miscellaneous debris and materials which contain asbestos
- Elevated uranium levels in waste rock

CONCERNS AT BEAVERLODGE SITE

- Unsecured mine openings, including mine shaft, and trenches
- Radiation levels and uranium levels in waste rock near the pits
- Burned remains of former buildings
- Miscellaneous debris and scrap

WORK COMPLETED

2008-09 Phase III Environmental Site Assessment
2008-09 Human Health Risk Assessment
2009-10 Elders site tour
2010-11 Remedial options selected through input from Tłı̨chǫ Elders and Executive

FUTURE PLANS

A Remedial Action Plan will be developed over the winter of 2010-11. Remediation will likely include closure of mine openings, addressing waste rock, and demolition of buildings and tanks. ■

4 Spider Lake

The Spider Lake Exploration Site is located on an island at the centre of Spider Lake, 233 km northeast of Yellowknife. The island, called "Treasure Island", is 200 hectares in size. Exploration at the site occurred sporadically between 1945 and 1988.

CONCERNS AT THE SITE

- Collapsing structures and debris left behind
- Potential soil contamination

WORK COMPLETED

2009 Phase III Environmental Site Assessment work included the collection of soil, groundwater, surface water, and sediment samples

FUTURE PLANS

Data collected is being reviewed in 2011-12 to determine what further investigation, if any, is required. ■

Colomac Before

5 Colomac Mine

The Colomac Mine was a gold mine in operation from 1989 to 1997 and is located 222 km northwest of Yellowknife. Mining production lasted from 1990-97 and the following year, Royal Oak Mines Inc. placed the mine in care and maintenance. It reverted to the Crown in 1999 when Royal Oak Mines Inc., went into receivership.

CONCERNS AT THE SITE

- Tailings and hydrocarbon contamination
- Hydrocarbon contaminated soil around the mill, areas of bedrock and the Steeves Lake shoreline around the mill buildings.
- Diesel and oil barrels left behind

WORK COMPLETED

1999-00 Emergency care and maintenance and site clean-up
2001-03 Water treatment to reduce cyanide and cyanide-related compounds, ammonia, and heavy metals in Tailings Lake and Zone 2.0 Pit
2004-05 Demolition and excavation of the tank farm and construction of the barrier wall and land treatment unit
2006-07 Tailings Lake and Zone 2.0 Pit water treated to discharge levels and construction of major civil works (Dam 1B, tailings cap, discharge channel)
2008-09 Construction of caribou berm, decommissioning of caribou fence, waste consolidation, waste oil inventory
2010-11 Final site remediation including demolition of buildings, remediation of the Steeves Lake shoreline, treatment of hydrocarbon-impacted soil and water, collection of free product, routine water quality monitoring

FUTURE PLANS

Most of the remediation was completed by December 2010 and the contractor is expected to demobilize from site in March of 2011. The camp complex buildings (two ATCO trailers) are the only remaining structures currently standing and those are scheduled to be demolished prior to demobilization. The treatment of remaining hydrocarbon-impacted soils and final clean-up will be carried out in 2011-12.

5

Colomac After

Steeves Lake Shoreline Remediation

When all remediation work has been completed, a long-term monitoring and post-closure hydrocarbon management plan will be developed. The airstrip will remain in place as an emergency airstrip and the large steel warehouse known as “Big Blue” will remain on site at the request of the Tłı̨chǫ Government. ■

The Colomac Mine site is located along the shore of Steeves Lake, 222 km northwest of Yellowknife. During mining operations, significant volumes of diesel and gasoline leaked from the bulk fuel tank farm and pumping facilities, impacting the shoreline along Steeves Lake. The hydrocarbons have flowed into Steeves Lake through faults and fractures along the shoreline.

During remediation of the Colomac Mine site, the Steeves Lake shoreline has been protected from further hydrocarbon contamination through the collection of free product from wells and the use of containment booms and absorbent materials such as:

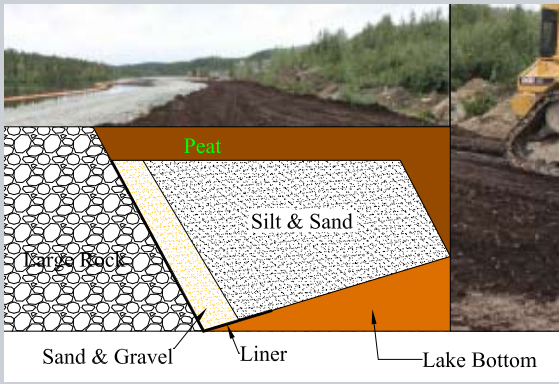
- Lake booms or disposable absorbent booms which are floating containment devices designed to contain hydrocarbon product on a water surface for collection by pads or a skimmer
- A floating barge known as a “skimmer” that collects hydrocarbon product from lake surface

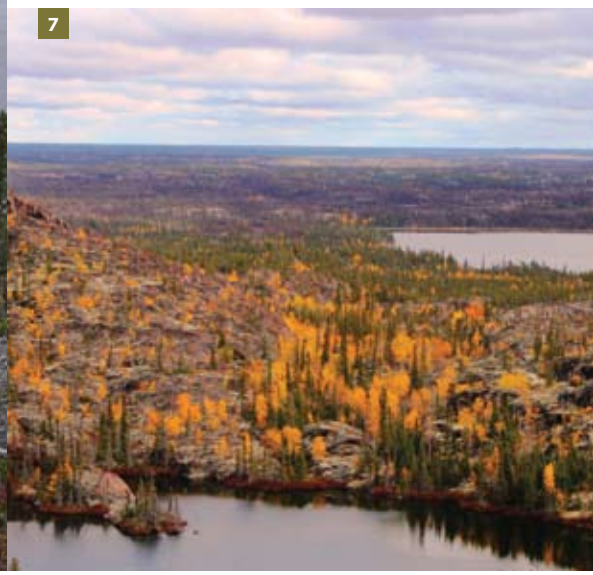
WORK COMPLETED

1999-present Free product recovery and shoreline protection

2006-09 Three sediment surveys

2010-11 Final shoreline remediation and restoration was completed from May to September and included: placement of a coarse rock armour wall to support and protect the remediated shoreline; installation of a geotextile liner to contain the impacted sediments and granular and peat backfill to support re-vegetation of the shoreline. ■





6 North Inca

The North Inca mine site is located approximately 190 km north of Yellowknife. Gold exploration occurred at the site between 1945 and 1949, including surface and underground drilling. There has not been significant activity at the site since 1949.

CONCERNS AT THE SITE

- A partially open mine shaft
- Deteriorating buildings
- Two above-ground fuel storage tanks
- Asbestos-containing materials.

WORK COMPLETED

2009-10 Remediation began and included the closure of mine openings, demolition of buildings and removal of fuel storage tanks

2010-11 Full remediation was completed with the removal of all materials from site and initial monitoring was conducted

FUTURE PLANS

A piece of equipment with historical significance—a D3 Caterpillar—was discovered in 2009 at the north end of the property and will be removed on the winter road in 2011.

Further site inspections will be carried out in 2012 and 2014 to confirm the effectiveness of the remediation work. ■

7 Rayrock Mine

The Rayrock Mine site is located 145 km northwest of Yellowknife. Rayrock Mine was an underground uranium mine in operation from 1957 to 1959. During operations, approximately 70,000 tonnes of ore were processed, yielding 207 tonnes of uranium concentrate.

CONCERNS AT THE SITE

- Radioactive tailings were deposited on land in two containment areas and a garbage dump
- The mine was also a potential source of radioactivity, through radon gas emissions from mine openings and ventilation shafts
- Miscellaneous debris and scrap that may contain asbestos

WORK COMPLETED

1996-97 Remediation complete - work included sealing all mine openings and ventilation shafts, relocating radioactive material from the dump to the tailings piles and capping the tailings with a thick layer of silt-clay, followed by revegetation

1998-99 Short-term monitoring program, and the development of the long-term monitoring program

1999-09 Ten year annual monitoring began as part of the long-term monitoring activities (requirement of Canadian Nuclear Safety Commission Licence)

2009-10 A performance assessment was started to look at the conditions of closure in 1996 and compare it with present day standards

2010-11 Annual radon monitoring survey completed and the Rayrock Elders Committee met for the first time to discuss community concerns about the site

FUTURE PLANS

INAC will continue to monitor the site in 2011-12 and carry out the remainder of the performance assessment. The Rayrock Elders Committee will continue to meet to discuss findings from the investigations and develop options for monitoring and maintenance. ■

Community Involvement

Tłı̨chǫ Elders and community members have been actively involved in the remediation process of all sites being addressed by INAC in the Wek'èezhìi Area. The Tłı̨chǫ Government, Elders, and local communities are engaged through community presentations and Tłı̨chǫ Executive briefings which help to ensure their involvement in the planning and design of any potential remediation options. Elders also visit the sites to examine remediation progress and provide valuable traditional knowledge related to future remediation plans.

In September 2010, Elders visited the Colomac Mine site towards the end of a very successful remediation season. Elders inspected remediation work completed over the summer and helped re-vegetate the Truck Lake Channel (see photo above). The channel was restored to pre-development conditions to allow natural flow from Baton, Spot, and Truck Lakes into Steeves Lake.

As the Colomac Project is nearing the end of remediation, members of the media were invited to join the Elders as they toured the site, learning about what the land was like before it was mined for gold and what the Elders hope the land will look like when remediation is complete. At the end of the day, the entire group enjoyed the new view from the Primary Crusher pad looking out over an area where only months before, the tank farm and other buildings still stood (See before and after photos on pages 4 and 5).

Elders and the media will be invited back to the site in 2011 to celebrate the successful remediation of Colomac, all the people involved in making it a success and the 10 years of hard work it took to complete. A ceremony will be held to mark this achievement and the return of the land to nature. ■

Northern Contaminants Program

photo credit: Paul Vecsei

The Northern Contaminants Program (NCP) was established in 1991 in response to concerns about human exposure to elevated levels of contaminants in wildlife species that are important to the traditional diets of northern Aboriginal peoples. Early studies found a wide variety of substances, many of which had no arctic or Canadian sources, but which were, nevertheless, reaching unexpectedly high levels in the arctic ecosystem.

The NCP is represented in the Northwest Territories by a regional committee called the Northwest Territories Regional Contaminants Committee. The committee develops and coordinates research priorities for the NWT and its membership includes Aboriginal organizations, government departments and health boards. It provides information to the public about the presence and possible effects of contaminants and, in association with the Government of the NWT - Department of Health, information is also provided to the public on the risks and benefits of consuming traditional foods.

The NCP allocates funds for research and related activities in five main areas:

1. Human Health
2. Environmental Monitoring and Research
3. Community Based Monitoring and Research
4. Communications, Capacity, and Outreach
5. National/Regional/International Coordination and Aboriginal Partnerships.

Research in the Wek'èezhìi Area has included:

- Contaminant levels (Mercury, PCBs, Persistent Organic Pollutants) in trout and burbot on Great Slave Lake near Lutsel K'e and Fort Resolution

For results or additional information on these subjects, contact the INAC NT Region NCP representative at (867) 669-2416. ■

If you see a contaminated site, or have questions about sites in your area, contact us:

Contaminants and Remediation Directorate
Indian and Northern Affairs Canada, NT Region
P.O. Box 1500
Yellowknife, NT X1A 2R3
Phone: 867 669 2416
Fax: 867 669 2721
Email: ntcard@inac-ainc.gc.ca

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