



# WHAT'S HAPPENING in the Wek'èezhì Area?

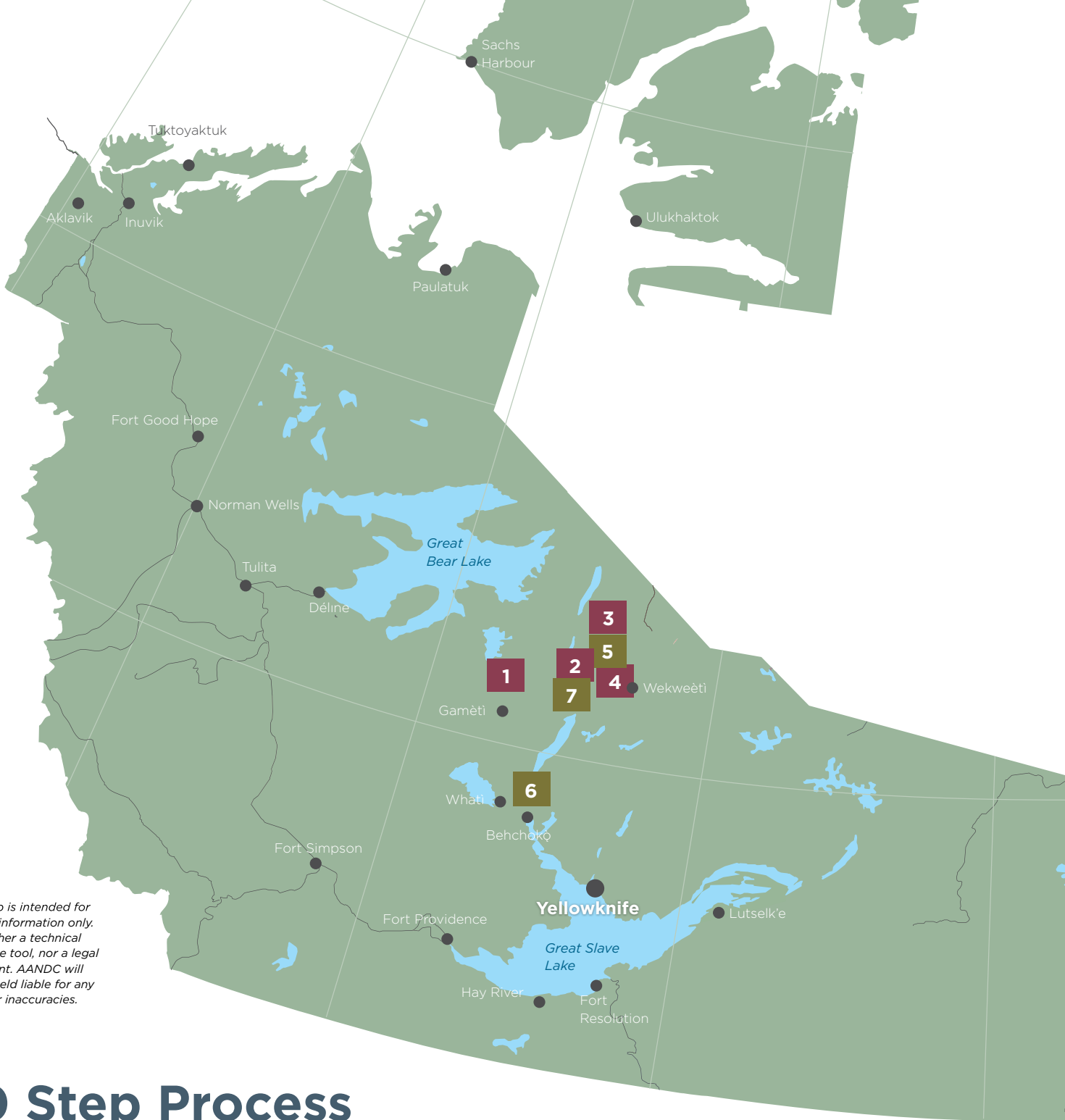
## Contaminated Site Remediation

2011 in Review

### About the Contaminants and Remediation Directorate

Aboriginal Affairs and Northern Development Canada (AANDC) 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, AANDC became custodian of these properties and related remediation activities.

*This map is intended for general information only. It is neither a technical reference tool, nor a legal document. AANDC 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 that there would be a common approach to the management of contaminated sites. For more information on the 10-step process, please visit [www.aadnc-aandc.gc.ca/eng/1100100027359](http://www.aadnc-aandc.gc.ca/eng/1100100027359)

**LEGEND:**

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

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





## 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 INCLUDED:

- Contaminated water management and treatment
- Exposed tailings and potential wildlife impacts
- Hydrocarbon-contamination at former tank farm area, mill and shop
- Hydrocarbon-impacted bedrock, groundwater, soil and sediment along Steeves Lake shoreline
- Waste oil and chemical inventories at mine closure
- Abandoned mine complex buildings
- Open pits and abandoned quarries

### 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

**2011/12** Treatment of remaining hydrocarbon-impacted soils, final site clean-up and demobilization from site

### WHAT'S NEXT?

The Monitoring Phase of the project will begin in 2012 and include:

- The Adaptive Hydrocarbon Management Program which will address residual hydrocarbons in the bedrock
- Water quality, water levels in lakes, streams and pits
- Geotechnical stability of Dam 1B, tailings cap, spillway and discharge channel, non-hazardous landfill
- Erosion and site drainage

- Re-vegetation success
- Aquatic/terrestrial wildlife health.

Monitoring will continue at the site until it can be determined that remediation has been effective and that site conditions have reached a steady state.

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. Now that remediation at Colomac is complete, a ceremony will be held at site in the summer of 2012 to celebrate the conclusion of this long-term project. The event will include a site blessing ceremony by Tłı̨chǫ Elders and the unveiling of a commemorative monument.

In December 2011, Merc International Minerals Inc. announced an interest in developing mineral claims in the southern parts of the Colomac Mine property. AANDC and Merc have agreed that in return for the mineral claims and leases at the Colomac site, Merc will remediate three smaller sites in the area: Diversified/Indigo Mine, Spider Lake Exploration Site and Chalco Lake Exploration Site. ■



# Colomac Remediation is Complete!

After 12 years of hard work by many parties, the Colomac Mine site's remediation has now officially gone from "in progress" to "complete". To celebrate the completion of the final remediation contract and to acknowledge the efforts of many people over the years, AANDC held a small event in Behchoko in December 2011. Elders from the surrounding three Tlicho communities were flown into Behchoko to join in the festivities. The Tlicho Grand Chief and Community Chiefs were also in attendance as well as representatives from the Tlicho Government, Tlicho Investment Corporation and Wek'eezhii Land and Water Board.

The evening included a feast and the presentation of recognition plaques to over 60 individuals, companies and organizations, all of whom have made significant contributions to the project. Another highlight of the event was a video compiled by the Colomac Project Team which included footage filmed at the site over the years; particularly, staff who worked on the remediation and Elders who contributed to the remediation planning.

Also on display were a miniature replica of the site before remediation began, photos of the site before and after remediation, and a life-sized photo of a slab of rock at Colomac where site visitors have etched their names over the years. Attendees were not only invited to peruse the names on the rock; pens were provided so that everyone at the celebration could sign their names on the photo.

Before the evening was over, current Project Manager, Ron Breadmore told the crowd about a ceremony planned for next summer at the Colomac site. This event will include a site blessing ceremony by Tlicho Elders and the unveiling of a commemorative monument which details the three phases of the Colomac Mine site: traditional use of the area by the Tlicho People in the past; mine production and socio-economic benefits and the remediation of the site, which will mark the final chapter of this long-term project. ■



## 6 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 INCLUDED:

- Radioactive tailings which 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





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**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

**2011/12** The Performance Assessment Report (which provides a detailed comparison of conditions at the site against the reclamation objectives and closure criteria) was completed and proposes a new monitoring frequency and scope for the site. A gap analysis of existing site data (wildlife, fish, vegetation, groundwater, sediment) was also conducted to identify what more information is required to complete a detailed Human Health and Ecological Risk Assessment.

#### WHAT'S NEXT

Monitoring activities this year will include investigating an area of previously unknown hydrocarbon contamination as well as an investigation of buried material to help close knowledge gaps. The Rayrock Elders Committee will continue to meet to discuss findings from investigations and develop options for monitoring and maintenance. A mapping exercise with Tłıchǫ Elders in February 2012 will also help better understand the historic transportation route. ■

## 7 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 INCLUDED:

- 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

#### WHAT'S NEXT?

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

# Assessment Sites

A number of contaminated sites have been identified and prioritized in the Wek'èezhii Area.



## 1 Indore/Beaverlodge (Hottah) Mines

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

### CONCERNS AT INDORE MINE INCLUDE:

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

### CONCERNS AT HOTTAH (BEAVERLODGE) MINE INCLUDE:

- 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 were selected through input from the Tłı̄ch̄q Elders and Executive

**2011/12** Poor weather did not permit site access for this year's field season

### WHAT'S NEXT?

A site investigation is anticipated for summer of 2012 to resolve data gaps identified in the draft Remedial Action Plan and complete a comprehensive archaeological survey of the site. Initial remediation work is expected to begin following winter road construction and mobilization to site in March of

2014. Remediation is expected to take approximately one year and will include closure of mine openings, addressing waste rock dumps, demolition of buildings and tanks and off-site removal of wastes.

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. ■

# Agreement with Merc International

AANDC and Merc International Minerals Inc. have negotiated a mutually beneficial agreement regarding three contaminated sites in the Wek'èezhìi Area. In return for mineral claims and leases on the Colomac property, Merc has agreed to remediate Diversified/Indigo Mine, Spider Lake Exploration Site and Chalco Lake Exploration Site.

Merc will be responsible for the remediation planning and activities, subject to AANDC approval and the

conditions of any regulatory approvals, such as land use permits. Merc has agreed to protect the remedial efforts undertaken at the Colomac site and will work with the Tłı̨ch̨o when preparing remediation plans for the three contaminated sites.

Once the remediation work is complete, final inspections will be conducted by an independent engineer to ensure remediation objectives are met. ■



## 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 INCLUDE:

- Structures and equipment left at the site
- An unsecured mine opening
- Areas of soil contamination

### WORK COMPLETED:

**2009** Phase I Environmental Site Assessment (review of historical records)

**2010** Phase II Environmental Site Assessment (conducting sampling at the site). ■

## 3 Spider Lake Exploration Site

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 INCLUDE:

- Collapsing structures and debris left behind
- Areas of soil contamination

### WORK COMPLETED:

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

**2011** Data collected was reviewed to determine if further investigation would be required. ■

## 4 Chalco Lake Exploration Site

The Chalco Lake Exploration Site is located approximately 210 km north of Yellowknife near the Diversified/Indigo Mine site. 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 INCLUDE:

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

### WORK COMPLETED:

**2009** Debris removal including demolition of a building on the site, burning of clean, combustible materials, and removal of all waste materials

**2010** Phase II Environmental Site Assessment of two small areas of hydrocarbon-contamination

**2011** Phase II results were reviewed to determine the extent of residual hydrocarbon and metal contamination in soil and what further remediation is required at this site. ■





photo credit: Paul Vecsei

# Northern Contaminants Program

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: Human Health, Environmental Monitoring and Research, Community Based Monitoring and Research, Communications, Capacity, and Outreach, and National/Regional/International Coordination and Aboriginal Partnerships.

## Research in the Wek'èezhii 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
- Inda K'eu Aquatic Ecosystem Monitoring - fish sampling at Marian and Russell Lake
- Cadmium and selected metals in NWT Moose

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



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

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