

OVERVIEW 2016

# NUNAVUT

MINERAL EXPLORATION, MINING  
AND GEOSCIENCE



Canada



## TABLE OF CONTENTS

Land Tenure in Nunavut.....	3
Indigenous and Northern Affairs Canada .....	5
Government of Nunavut .....	9
Nunavut Tunngavik Incorporated.....	13
Canada-Nunavut Geoscience Office .....	15
Summary of 2016 Exploration Activities	
Kitikmeot Region .....	20
Kivalliq Region .....	22
Qikiqtani Region.....	24
Active Projects .....	26
Inactive Projects.....	48
Guide to Acronyms.....	51
Glossary.....	52
Index .....	54

### **About Nunavut: Mineral Exploration, Mining and Geoscience**

This publication is a combined effort of four partners: Indigenous and Northern Affairs Canada (INAC), Government of Nunavut (GN), Nunavut Tunngavik Incorporated (NTI), and Canada-Nunavut Geoscience Office (CNGO). The intent is to capture information on exploration and mining activities in 2016 and to make this information available to the public.

We thank the many contributors who submitted data and photos for this edition. Prospectors and mining companies are welcome to submit information on their programs and photos for inclusion in next year's publication. Feedback and comments are always appreciated.

### **NOTE TO READERS**

This document has been prepared based on information available at the time of writing. All resource and reserve figures quoted in this publication are derived from company news releases, websites, and technical reports filed with SEDAR ([www.sedar.com](http://www.sedar.com)). Readers are directed to individual company websites for details on the reporting standards used. The authors make no guarantee of any kind with respect to the content and accept no liability, either incidental, consequential, financial or otherwise, arising from the use of this document.

All exploration information was gathered prior to December 2016. Exploration work was completed and reported on during 2015 or 2016 for all projects with active status in this publication. Projects with inactive status had exploration

work last completed on them in 2013 or 2014, have active mineral tenure, and may have valid land use permits and/or water licences as issued by INAC and the Nunavut Water Board, respectively.

The term National Instrument 43-101 (NI 43-101) refers to a standard for the disclosure of scientific and technical information about mineral projects. This standard is supervised by the Canadian Securities Administrators (CSA), the regulatory body which oversees stock market and investment practices, and is intended to ensure that misleading, erroneous or fraudulent information relating to mineral properties is not published and promoted to investors on the stock exchanges overseen by the CSA. Resource estimates reported by mineral exploration companies that are listed on Canadian stock exchanges must be NI 43-101 compliant.

### **ACKNOWLEDGMENTS**

This publication was written by the Mineral Resources Division at INAC's Nunavut Regional Office (Michal Russer, Matthew Senkow, Steve Sharpe, and Alexandr Beloborodov). Contributions were received from Linda Ham and colleagues at Canada-Nunavut Geoscience Office (CNGO), Jorgan Aitaok at Nunavut Tunngavik Incorporated, David Kunuk and Paul Budkewitsch at the Government of Nunavut, with cartography by Peter Frampton of FORMAR Geoscience.

*Cover photo: Diamond drilling off a barge at Amaruq, Nunavut. Courtesy of Agnico Eagle Mines Ltd.*

For information regarding reproduction rights, please contact Indigenous and Northern Affairs Canada at: [CommunicationsPublications@aadnc-aandc.gc.ca](mailto:CommunicationsPublications@aadnc-aandc.gc.ca)

[www.canada.ca/indigenous-northern-affairs](http://www.canada.ca/indigenous-northern-affairs)  
1-800-567-9604  
TTY only 1-866-553-0554

QS-Y397-011-EE-A1  
Catalogue: R71-39E  
ISSN: 2368-8092

© Her Majesty the Queen in Right of Canada, represented by the Minister of Indigenous and Northern Affairs, 2016

This Publication is also available in French under the title: *Exploration minérale, exploitation minière et sciences de la terre 2016 – Nunavut*. (PDF)





Waterfall close up on the Melville peninsula – Courtesy of North Arrow Minerals Inc.

## LAND TENURE IN NUNAVUT

The territory of Nunavut was created on April 1, 1999, after the signing of the Nunavut Agreement in 1993. Spanning two million square kilometres (km<sup>2</sup>), the territory has 25 communities and a population of 37,000. Inuit represent 85 per cent of the residents, creating the foundation of the territory's culture and values. With the exception of Baker Lake, communities are located on coasts, where hunting and fishing traditionally sustained the Inuit. There are no roads to Nunavut or connecting communities in Nunavut. Access is mainly by air with ships delivering supplies during the open water season.

As a modern day treaty, the Nunavut Agreement provides certainty and clarity of rights to ownership and use of lands and resources within Nunavut. It gave Inuit fee simple title to 356,000 km<sup>2</sup> of land making the Nunavut Agreement the largest Aboriginal land settlement in Canadian history. There are 944 parcels of Inuit Owned Land (IOL) where Inuit hold surface title only. The Crown retains the mineral rights to these lands. Inuit also hold fee simple title including mineral rights to 150 parcels of IOL, which totals 38,000 km<sup>2</sup> and represent approximately two per cent of the territory. Surface title to all IOL is held in each of the three regions (Kitikmeot, Kivalliq and Qikiqtani) by the respective Regional Inuit Association (RIA) while title to subsurface IOL is held

and administered by Nunavut Tunngavik Incorporated (NTI). Exploration agreements and mineral production leases are negotiated by NTI on land where it owns the subsurface rights while access permission and land use licences are granted by RIAs on all IOL.

The Government of Canada administers sub-surface rights for the remaining 98 percent of Nunavut. Prospecting permits, mineral claims and mineral leases are issued pursuant to the *Nunavut Mining Regulations* by Indigenous and Northern Affairs Canada's (INAC) Nunavut Regional Office. Surface rights for Crown land are administered according to the *Territorial Lands Act* and its regulations. Carving stone and building materials are administered pursuant to the *Territorial Quarrying Regulations* and are also issued by INAC's Nunavut Regional Office.

For more information on the location of IOL and Crown land in the territory, refer to the *Nunavut Mineral Exploration, Mining and Geoscience Projects 2016 Map*. For details on mineral tenure, visit the Nunavut Map Viewer at <https://services.aadnc-aandc.gc.ca/nms-scn/index.html>. The table on page four displays the number of prospecting permits, mineral claims and mineral leases held in good standing as of November 2016, and the accompanying figure illustrates the location and extent of this mineral tenure.



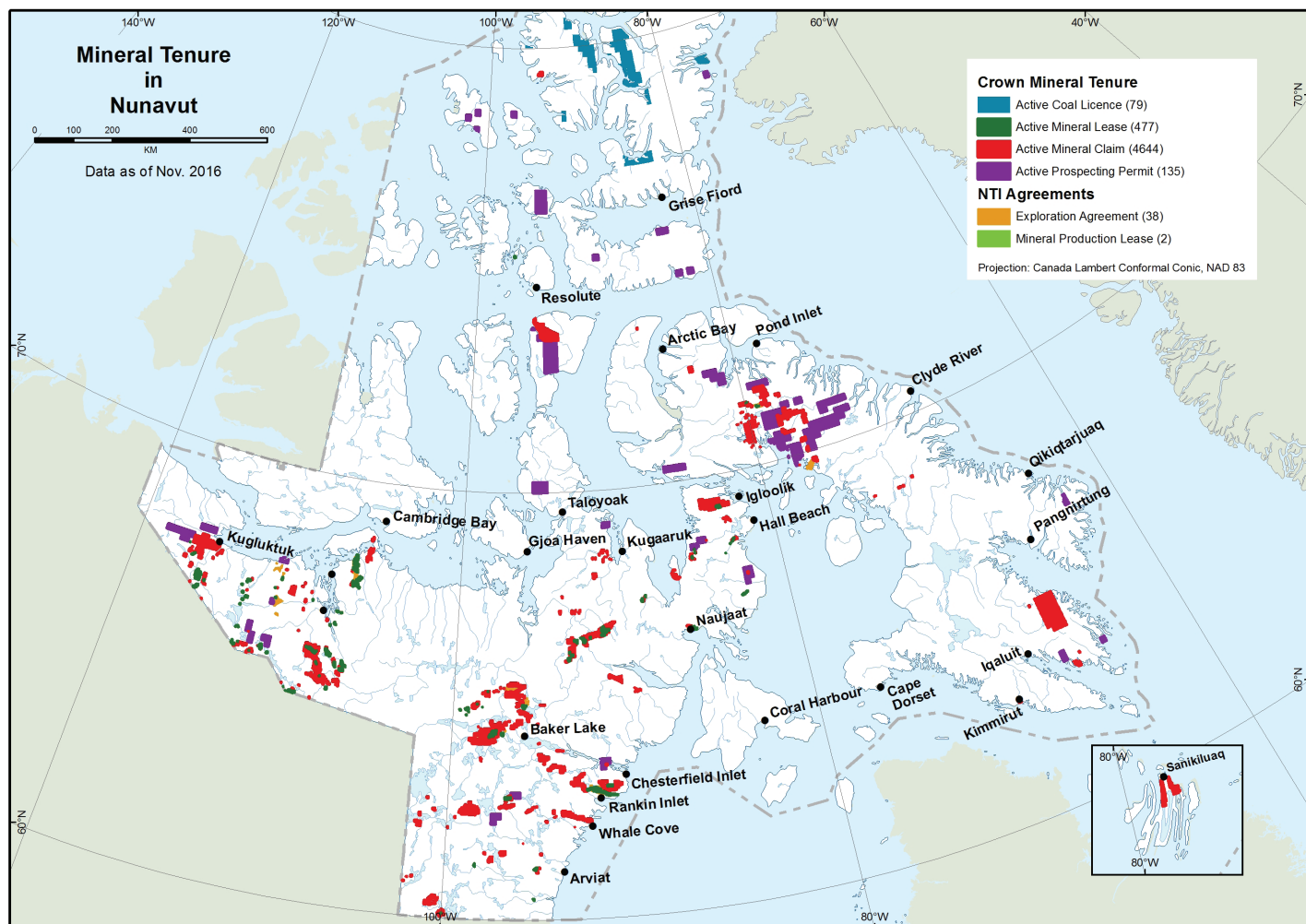
## MINERAL TENURE IN GOOD STANDING IN NUNAVUT *Source: INAC*

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Prospecting Permits	1,057	1,041	394	477	314	259	196	110	132	124
Claims	7,905	8,088	7,613	7,178	6,777	6,066	5,562	4,278	4,279	3,335
Leases	354	479	590	631	567	627	701	492	461	477

## EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES IN NUNAVUT *Source: Natural Resources Canada*

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016*
Juniors (Millions \$)	237.4	261.4	56.9	125.0	163.0	129.0	111.0	73.6	42.5	36.5
Seniors (Millions \$)	100.6	171.2	130.7	131.7	372.6	293.5	146.6	84.4	172.5	85.6
Total	338.0	432.6	187.6	256.7	535.6	422.5	257.6	158.0	215.0	122.1

\* Revised spending intentions released November 2016







## INDIGENOUS AND NORTHERN AFFAIRS CANADA

Representing one-fifth of Canada's land mass, Nunavut has tremendous resource potential and is a place of significant opportunity for Inuit, Northerners and all Canadians. Statistics released by Natural Resources Canada indicate spending intentions for exploration and deposit appraisal expenditures in Nunavut for 2016 were down to \$122.1 million from estimated expenditures of \$215 million for 2015. The continued downturn in the mineral exploration sector is particularly felt in Nunavut, which due to its size and remoteness is a high-cost jurisdiction to explore.

Indigenous and Northern Affairs Canada (INAC)'s mandate related to mineral resource development in Nunavut includes the implementation of the Nunavut Agreement, the administration of surface and subsurface rights on Crown land, and the stewardship of land and water resources.

## IMPLEMENTATION OF THE NUNAVUT AGREEMENT

The Nunavut Agreement signed in 1993, guarantees the right of Inuit to participate in decision-making concerning the use, management, and conservation of land, water, and resources. To achieve this, the Nunavut Agreement created five Institutions of Public Government:

- Nunavut Planning Commission (NPC) prepares and assesses compliance with land use plans;
- Nunavut Impact Review Board (NIRB) conducts environmental assessments;
- Nunavut Water Board (NWB) manages fresh water resources;
- Nunavut Surface Rights Tribunal manages disputes related to surface rights; and
- Nunavut Wildlife Management Board manages wildlife.

The *Nunavut Planning and Project Assessment Act* (NuPPAA) received royal assent on June 18, 2015 and came into force on July 9, 2015. These two significant developments pertain to the above institutions and affect the regulatory process for exploration and large-scale project development.

### NUNAVUT PLANNING AND PROJECT ASSESSMENT ACT

As required by the Nunavut Agreement, *NuPPAA* establishes in legislation the powers, functions, objectives, and duties of the NPC and NIRB. The existing overall approach to resource management in Nunavut does not change under *NuPPAA*, however, *NuPPAA* clarifies and strengthens elements of the regulatory regime. The changes are the result of close consultation and collaboration with the Government of



Metaquartzite in a panel of supracrustal rocks, northwestern Hudson Bay – Courtesy of CNGO

Nunavut (GN), Nunavut Tunngavik Inc (NTI), the NIRB, and the NPC and include:

- minor changes in the appointment of board members to the NPC and NIRB;
- the introduction of timelines in the environmental assessment process to encourage timely decision making by the NPC, NIRB and the Minister of Indigenous and Northern Affairs in relation to the processing of applications; and
- the implementation of a 'single window entry' into the regulatory process that requires any new project proposal in Nunavut to be first submitted to NPC rather than to other authorities.

This final change does not apply to projects that entered the land use or environmental assessment process before *NuPPAA* came into effect or to project amendment requests for existing projects. *NuPPAA* also includes provisions for the delegation of the powers, duties, and functions of the Minister of Indigenous and Northern Affairs to a territorial Minister.



### ***NUNAVUT WATERS AND NUNAVUT SURFACE RIGHTS TRIBUNAL ACT***

The *Nunavut Waters and Nunavut Surface Rights Tribunal Act*, in 2002, established in legislation the NWB and the Nunavut Surface Rights Tribunal. Part II of the *Yukon and Nunavut Regulatory Improvement Act* makes amendments to the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* including:

- the introduction of a nine-month time limit for water licence reviews and the possibility of ‘life-of-project’ water licences, designed to streamline the water licensing process;
- the establishment of a cost recovery regime to recover costs related to the consideration of an application, or the renewal, amendment or cancellation of a licence;
- an increase of existing fines associated with water licences and new administrative monetary penalties designed to enhance environmental stewardship; and
- the requirement that the NWB consider agreements between land owners and proponents regarding reclamation security to minimize the effect of over bonding.

### **ADMINISTRATION OF SURFACE AND SUBSURFACE RIGHTS**

Nunavut is the only jurisdiction in Canada where the Government of Canada rather than the province or territory manages Crown land. In July 2016, the Minister of Indigenous and Northern Affairs announced the appointment of a Chief Federal Negotiator to negotiate an Agreement-in-Principle for the devolution of lands and resources in Nunavut. With this appointment, the Government of Canada continues the formal negotiation process that will transfer province-like responsibilities for land and resource management to the Government of Nunavut. Devolution is an important step in the political and economic development of Nunavut. Giving Nunavut greater control over its lands and resources ensures that Inuit and Northerners participate in realizing the economic potential of the region and that Nunavut remains an attractive place to live, work, and invest.

### **NEWLY AMENDED TERRITORIAL LAND USE REGULATIONS AND TERRITORIAL QUARRYING REGULATIONS**

On June 10, 2016 the amendments to the Territorial Land Use Regulations and Territorial Quarrying Regulations were approved.

Amendments to the [Territorial Land Use Regulations](#) include:

- increasing the duration of land use permits from two years to up to five years;
- allowing more time for consultation on Class B land use permit applications; and
- updating the information requested for final reports to reflect current technology.

Amendments to the [Territorial Quarrying Regulations](#) include:

- increasing the permit duration from one year to a maximum of three years;
- introducing new definitions of existing terms; and
- converting Imperial units to metric.

### **MAP SELECTION AND THE NUNAVUT MINING REGULATIONS**

Amendments to the [Nunavut Mining Regulations](#), are being proposed to enable the replacement of ground staking in Nunavut with online map selection of mineral claims. Further announcements regarding the implementation of online map selection will be provided once the amendments to the regulations are approved.

### **INDIGENOUS AND NORTHERN AFFAIRS CANADA’S NUNAVUT REGIONAL OFFICE**

The Mining Recorder’s Office administers subsurface rights on Crown land in the territory. As of November 2016 there are 124 active prospecting permits, 3,335 mineral claims and 477 mineral leases.

The area held as mineral claims, prospecting permits, and mining leases, including those on Crown land and grandfathered leases on Inuit Owned Land (IOL), totals 7.17 million hectares (ha) as of November 2016, covering approximately 3.5 per cent of the territory. More than 540,000 hectares in new claims and prospecting permits were acquired in 2016, contrasting with 670,000 ha in cancelled claims, for a net decrease of approximately 15 per cent. Many of the cancelled claims were acquired during a period of increased mineral exploration in 2005-2006, and had reached the end of the ten year claim life.

The Mineral Resources Division reviews annual work reports that, under the Nunavut Mining Regulations, mineral rights-holders must file to show that they have met minimum annual work requirements. The reports are confidential for a period of three years, after which they are released to the public on [www.nunavutgeoscience.ca](http://www.nunavutgeoscience.ca). In 2016, 45 reports documenting \$66.87 million worth of work were released to the public.

The Land Administration Division administers surface rights on Crown land in Nunavut. As of November 2016 there are 192 active land use permits and six quarry permits.

### **STEWARDSHIP OF LAND AND WATER**

Several divisions of Indigenous and Northern Affairs Canada’s Nunavut Regional Office are involved in the stewardship of



land and water resources. This includes participating in the regulatory process, enforcing authorizations and licences issued by Institutions of Public Government (IPGs) or INAC, and enabling monitoring that informs decision-making.

The Impact Assessment Division and a socio-economic analyst participate in Nunavut Impact Review Board (NIRB) environmental assessments. In 2016, the Impact Assessment Division provided detailed expertise and technical review comments to the NIRB for environmental assessments of six major project proposals and 65 smaller proposals. The division also reviewed three annual monitoring reports, submitted by proponents of major projects, to ensure they complied with terms and conditions of existing project certificates.

The Water Resources Division participates in various water licensing processes of the Nunavut Water Board by providing sound technical advice to the Board for the protection of water resources in the territory. In 2016, the Water Resources Division provided advice in relation to more than 70 Water Licence applications, amendments, renewals, cancellations, and plans.

The Division is also responsible for co-management of the territory's water resources and does this in part by monitoring water quality in the territory; reviewing water quality monitoring reports and participating in two water quality monitoring initiatives. One of these initiatives is concentrated in and around the city of Iqaluit. The other part of a Memorandum of Understanding with the Kivalliq Inuit Association involves the monitoring of water quality around centres of municipal, mining and exploration activities in the Kivalliq Region.

INAC has been involved in cooperative work initiated in 1975 with Environment Canada's Water Survey Division. There are currently 25 active hydrometric stations in Nunavut, ten of which are funded, in whole or in part, by INAC.

The Field Operations Division enforces land-use permits and water licences by conducting inspections to ensure that proponents are complying with the terms and conditions contained in these authorizations. In 2016, the Field Operations Division in Nunavut inspected 192 land and water authorizations associated with exploration camps, mines, and research camps, as well as twenty-four municipal water licences.



Intensely-folded quartz vein – *Courtesy of North Arrow Minerals Inc.*



The Land Administration Division, in addition to the responsibilities explained above, supports the licensing and environmental assessment processes by incorporating terms and conditions of project certificates and water licences into the authorizations they issue.

### **NUNAVUT GENERAL MONITORING PLAN**

In addition to the monitoring noted above, INAC hosts the Nunavut General Monitoring Plan (NGMP) Secretariat. The NGMP coordinates monitoring projects across the territory, identifies gaps where monitoring needs to take place, and through targeted investments funds research initiatives that complement or build on existing knowledge. The purpose of monitoring is to increase public access to ecosystemic and socio-economic information and inform decision making related to the impact of large-scale developments. The NGMP is a partnership mandated by the Nunavut Agreement and overseen by a steering committee comprised of INAC, on behalf of the Government of Canada, the Nunavut Planning Commission, the Government of Nunavut, and Nunavut Tunngavik Inc.

The NGMP completed a successful 2016-17 call for proposals and provided \$884,053 to 20 recipients in grants and contributions funding.

The Inu'tuti Project, a watershed-based monitoring program for the Baker Lake Basin funded by NGMP, is a collaborative initiative between the NGMP, INAC's Water Resources Division, the Kivalliq Inuit Association, and the Nunavut Water Board to develop a watershed management strategy. Following the Baker Lake Basin Indicators Workshop held in September 2014, an Inuit Traditional Knowledge Workshop was held in January 2016 in Baker Lake. Work is underway to develop a monitoring program in 2017 that will incorporate the input of Baker Lake residents and technical advisors.

### **CONTACTS**

#### **NUNAVUT REGIONAL OFFICE**

PO Box 2200, Iqaluit, NU X0A 0H0  
t: 867 975 4500 • f: 867 975 4276

#### **RESOURCE MANAGEMENT DIRECTORATE**

Karen Costello, Director  
t: 867 975 4546 • e: Karen.Costello@aandc-aadnc.gc.ca

#### **WATER RESOURCES**

t: 867 975 4550  
e: AANDC.WatersNU-EauxNU.AADNC@aandc-aadnc.gc.ca

#### **IMPACT ASSESSMENT**

Charlotte Lamontagne, Acting Manager, Impact Assessment  
t: 867 975 4549 • e: AANDC.EnvironmentNU-EnvironnementNU.AADNC@aandc-aadnc.gc.ca

#### **MINERAL RESOURCES**

e: AANDC.MineralsNU-MinerauxNU.AADNC@aandc-aadnc.gc.ca

Matthew Senkow, Manager, Mineral Resources  
t: 867 975 4290 • e: Matthew.Senkow@aandc-aadnc.gc.ca

Michal Russer, District Geologist  
t: 867 975 4291 • e: Michal.Russer@aadnc-aandc.gc.ca

#### **ARCHIVES INFORMATION**

t: 867 975 4293 • f: 876-975-4276  
e: AANDC.ArchivesNU.AADNC@aandc-aadnc.gc.ca

#### **LANDS AND CONTAMINATED SITES DIRECTORATE**

e: AANDC.LandsMiningNU-TerrainsMiniersNU@aandc-aadnc.gc.ca

Tracey McCaie, Manager, Land Administration  
t: 867 975 4280 • e: Tracey.McCaie@aadnc-aandc.gc.ca

Karen Dunphy, Mining Recorder  
t: 867 975 4281 • f: 867 975 4286  
e: Karen.Dunphy@aandc-aadnc.gc.ca

#### **FIELD OPERATIONS (INSPECTIONS, COMPLIANCE AND ENFORCEMENT)**

Erik Allain, Manager  
t: 867 975 4295 • e: Erik.Allain@aandc-aandc.gc.ca

#### **NUNAVUT GENERAL MONITORING PLAN**

Marcus Bermann, Manager  
t: 867-979-0085 • e: Marcus.Bermann@aandc-aadnc.gc.ca  
www.ngmp.ca

#### **WEBSITE**

[www.aandc-aadnc.gc.ca/nu](http://www.aandc-aadnc.gc.ca/nu)





2016 Nunavut Prospectors Program's field work and sampling around Pond Inlet – *Courtesy of GN*



The Government of Nunavut (GN) is committed to supporting a strong and diversified minerals industry based on best practices of sustainable development, and partnerships between Nunavummiut and industry. Three important strategies that

outline GN priorities for resource development have been developed over the years by the Department of Economic Development and Transportation (EDT). Beginning in 2007, *Parnautit: A foundation for the future* is the Mineral Exploration and Mining Strategy, with a goal to create conditions for a robust minerals industry sector that contributes to an improving quality of life for Nunavummiut. The GN's mandate *Sivumut Abluqta: Stepping Forward Together (2014-2018)* promotes economic growth through responsible development in all sectors, recognizing the abundance of natural resources as an important contributor to long-term prosperity and success. More recently, *Ingirrasiliqta: Let's Get Moving* is the Nunavut Transportation Strategy which in part focuses on new infrastructure requirements to link communities to economic opportunities, including partnerships to construct and operate new transportation corridors to resource development projects. These strategic visions are shared between several partners, including the mining industry, Nunavut Tunngavik Incorporated (NTI) and the Government of Canada.

EDT's Minerals and Petroleum Resources Division (MPR) oversees resource management, socio-economic monitoring, and works with the mineral industry to prepare the territory for mineral development. The Departments of Environment and EDT are the lead participants for the GN in legislated reviews of development projects through interdepartmental working groups focused on both environmental and socio-economic impacts.

Two operating mines in Nunavut, the Meadowbank gold mine and the Mary River iron mine, are being joined by a third mine at Doris North, part of the Hope Bay Project. The new gold mine firmly anchors mining activity in each region, enabling many Nunavummiut from communities across the territory to derive employment benefits. The GN is committed to support further participation of Nunavummiut in the many resource-related opportunities on the horizon, as numerous discoveries and exploration projects advance through to development stages and project approval processes.

EDT has regional offices in Kugluktuk, Rankin Inlet, Pond Inlet, and Pangnirtung. MPR has its headquarters in Iqaluit, with resident geologists based in Arviat and Cambridge Bay. Efforts at MPR are largely concerned with priorities in Nunavut geoscience, resource management, prospector skills development, community education and awareness, investor confidence, and the development partnership agreements.



## MINERAL EXPLORATION AND MINING STRATEGY

The goal of *Parnautit*, the Nunavut Mineral Exploration and Mining Strategy, is: “To create the conditions for a strong and sustainable minerals industry that contributes to a high and sustainable quality of life for all Nunavummiut.”

*Parnautit* remains an important policy for the GN and builds on four pillars:

- the territory’s regulatory and taxation regimes;
- workforce training;
- infrastructure development; and
- environmental baseline data availability, to encourage mineral exploration and the development of a mining sector for the economy of Nunavut.

## URANIUM POLICY STATEMENT

### PUBLIC GEOSCIENCE

The Government of Nunavut’s *Uranium Policy Statement* was released in 2012 (<http://www.uranium.gov.nu.ca/>). The statement principles underscores the utmost importance of safe and responsible development of uranium mineral resources. Uranium mining projects can provide valuable employment and skills development; however they must also have the support of Nunavummiut, especially in communities close to development projects. Nunavummiut must be major beneficiaries of uranium exploration and mining activities. Additionally, uranium mined in Nunavut shall be used only for peaceful and environmentally responsible purposes.

The GN recognizes the jurisdiction and important roles of the Nunavut Impact Review Board and the Nunavut Water Board as established by the Nunavut Agreement in the regulation of uranium exploration and mining. Additionally, it is recognized that uranium is subject to international agreements and national laws, and the government supports the mandate and responsibilities of the Canadian Nuclear Safety Commission.

### GEOSCIENCE

The GN remains strongly committed to improving public geoscience as a means of encouraging new exploration investment. The Department of Economic Development and Transportation (EDT) provides core funding to the Canada-Nunavut Geoscience Office (CNGO) and program support for territorial mapping and geological research. One of the programs recently undertaken that involved both direct EDT work and collaboration with the CNGO was the Nunavut Carving Stone Resource Evaluation Program.

### CARVING STONE DEPOSIT EVALUATION PROGRAM

This program led by Department of Economic Development and Transportation (EDT) is a collaborative project with the Canada-Nunavut Geoscience Office (CNGO) and other partners. This multi-year program is territory-wide and funded by the Canadian Northern Economic Development Agency (CanNor) and EDT. Objectives of the program are to locate and evaluate known and new carving stone deposits, assess their artisanal suitability, and quantify the potential of these sources to supply nearby communities. Data collected will be distributed via an interactive web database. Site materials are also collected for archival, analytical and exhibition purposes.

Over 119 carving stone resource sites were evaluated, many of which are located near communities. Survey results indicate that 17 out of 25 communities have adequate supply of local carving stone resources to meet long term demands. In addition to 12 quarries, there are 20 undeveloped deposits with sufficient supply to provide stone for several decades to the nearest communities. Some communities where resources are limited by supply or are becoming depleted include Arviat, Chesterfield Inlet, Grise Fiord, Repulse Bay and Whale Cove.

In Nunavut, most carving stone is gathered seasonally at the two largest quarries which have been in operation since the 1970s. Cape Dorset’s Korok Inlet quarry is the premier producer of carving stone for south Baffin, supplying the communities of Cape Dorset, Kimmirut and Iqaluit with 450 tonnes per year of excellent quality artisan serpentinite.



Garnet grains in quartz, Clyde River NPP – Courtesy of GN

The main quarry in the Belcher Islands supplies Sanikiluaq carvers with 50 tonnes per year of excellent quality artisan marble. Both of these quarries were revisited in 2016 for further examination with our partners.

EDT reports results from the Carving Stone Deposit Evaluation program to communities through its community economic development officers, the Nunavut Arts and Crafts Association, Regional Inuit Organizations, and government and scientific agencies. As an outreach product, a carving stone map of the territory is planned for distribution in the upcoming year.

## RESOURCE MANAGEMENT

### IMPACT ASSESSMENT AND MONITORING

Department of Economic Development and Transportation (EDT) participates in Nunavut's environmental assessment review processes for project developments through the Government of Nunavut (GN) Environmental Assessment Review Team (EART). The primary purpose of the review team is to ensure resource developments in Nunavut are carried out responsibly and in line with the four priorities outlined in *Sivumut Abluqta*.

The EART is composed of two committees and a lead coordinator; EDT houses both the lead coordinator and the project management staff of the Socio-Economic Assessment Committee while the Department of Environment leads the Environmental and Human Health Assessment Committee. Together the EART reviews environmental impact statements submitted to the Nunavut Impact Review Board and actively participates in technical meetings, hearings, and regulatory workshops.

Nunavut's three Regional Socio-Economic Monitoring Committees are also led by EDT. The committees' primary purposes are to monitor the socio-economic impacts and benefits associated with major resource developments and determine if they are occurring as predicted in a given project environmental impact statement. These committees also address project-specific terms and conditions and provide a venue for a variety of stakeholders to take part in meaningful discussions surrounding resource development.

### PETROLEUM RESOURCES

Petroleum exploration in Nunavut began in 1962 and occurred throughout the territory until 1986. Nunavut, approximately 20 per cent of Canada's area, is estimated to have approximately a third of Canada's total petroleum resource endowment. Nunavut's discovered resources are



2016 Pond Inlet NPP prospector with a gneissic bloc

— Courtesy of GN

held in 20 licensed fields, mostly in the Sverdrup Basin in the high Arctic, and total nearly two billion barrels of crude oil and 27 trillion cubic feet of natural gas.

Indigenous and Northern Affairs Canada (INAC) is conducting environmental and consultation work for a strategic environmental assessment of Baffin Bay and Davis Strait. The Government of Nunavut supports this federal government initiative and is committed to responsible economic development of hydrocarbon resources.

## PROSPECTOR DEVELOPMENT

### INTRODUCTION TO PROSPECTING

Each year in communities throughout the territory, the Department of Economic Development and Transportation (EDT) geologists offer its Introduction to Prospecting Course (IPC) over a one week period to interested residents. This year 74 participants in seven communities (Arviat, Clyde River, Grise Fiord, Kimmirut, Pond Inlet, Resolute and Taloyoak) completed the course which provides basic training to encourage interest apply their knowledge of the land to mineral exploration by enhancing prospecting skills. Since 2000, the course has been delivered over 100 times in all 25 communities and a total of 1,163 residents have received training.

### NUNAVUT PROSPECTORS PROGRAM

Another program is operated by The Department of Economic Development and Transportation (EDT) to encourage mineral prospecting in Nunavut. It's called the





Visible gold in quartz, Huckleberry Gold project  
– Courtesy of GN

## MINERALS & PETROLEUM RESOURCES DIVISION

### HEADQUARTERS (IQUALUIT)

David Kunuk, Director

t: 867 975 7892 • e: dkunuk@gov.nu.ca

Paul Budkewitsch, Manager, Minerals

t: 867 975 7809 • e: pbudkewitsch@gov.nu.ca

Lou Kamermans, Manager, Environmental  
Assessment and Regulation

t: 867 975 7806 • e: lkamermans@gov.nu.ca

Annie Cyr-Parent, Sr. Advisor, Petroleum

t: 867 975 7827 • e: acyr-parent@gov.nu.ca

### ARVIAT OFFICE

e: minerals@gov.nu.ca

Ronnie Suluk, Manager, Community Mining Engagement

t: 867 857 3166 • e: rsuluk@gov.nu.ca

Mike Beauregard, Resident Geologist

t: 867 857 3165 • e: mbeauregard@gov.nu.ca

### CAMBRIDGE BAY OFFICE

e: minerals@gov.nu.ca

Harry Maksagak, Community Mining Advisor

t: 867 983 4160 • e: hmaksagak@gov.nu.ca

Hugh MacIsaac, Resident Geologist

t: 867 983 4224 • e: hmacisaac@gov.nu.ca

[www.gov.nu.ca/edt](http://www.gov.nu.ca/edt)

Nunavut Prospectors Program (NPP). Many participants who have successfully completed the Introduction to Prospecting course have subsequently applied to the NPP to start their own projects. Successful applicants qualify for a financial contribution of up to \$8,000 (per recipient, per year) towards expenses to carry out their own work. To qualify for funding, a prospector must be a resident of Nunavut, hold a valid prospector's licence, and have demonstrated prospecting experience or have completed the IPC. Contributions are awarded on the basis of the project proposal and past performance of the applicant in the program. Approximately 15 individual projects are supported annually through this program operating throughout Nunavut.

### COMMUNITY EDUCATION AND TRAINING

The Department of Economic Development and Transportation (EDT) works with various stakeholders to co-ordinate mining-related education and training programs and provides support to partners in community engagement activities. To support the minerals industry, EDT works with the Department of Education, Nunavut Arctic College, the Government of Canada, regional Inuit associations and industry partners on a number of initiatives to facilitate the participation of Nunavummiut in the opportunities mining activities bring to Nunavut.

The Nunavut Mine Training Fund provides support to participating partners to develop, co-ordinate and execute mine training programs for Nunavummiut. EDT contributes up to \$200,000 per year and for 2016-2017 included:

- Arviat Work Readiness Program and Class 3Q Driver Training (Hamlet of Arviat);
- Camp Hospitality Training (Kitikmeot Corporation); and
- Financial Literacy (Qikiqtani Inuit Association).

EDT recognizes that a solid scholastic foundation in math and science provides a basis for Nunavummiut to pursue further education towards a career in science and technology related fields. In 2016-2017 other initiatives included:

- Science Technology, Engineering and Mathematics Camps & Workshops;
- Kivalliq Science-Cultural Camp (Kivalliq Science Educators' Community); and
- Arnaqjuaq School Gardens (Arnaqjuaq School- Hall Beach).

These are intended to recognize and support students enrolled in math and science courses and encourage continued interest in these important fields.



Doris North mine complex with completed mill building – *Courtesy of TMAC Resources Inc.*



to promote their economic, social, and cultural well-being through succeeding generations.

The NTI Department of Lands and Resources, in cooperation with the three Regional Inuit Associations (RIAs) who are the surface owners of the Inuit Owned Lands (IOL) parcels, is responsible for the implementation of Inuit responsibilities related to the management of IOL, minerals, oil and gas.

NTI is the manager of the minerals for which the Inuit are the fee simple title owners. For these minerals, NTI issues mineral rights through a negotiated Mineral Exploration Agreement (MEA) that provides a holder the right, if it meets the terms of the MEA, to receive a mineral production lease that allows for mining a discovered resource.

Nunavut Tunngavik Incorporated (NTI) is the Inuit corporation responsible for overseeing the implementation of the Nunavut Agreement. NTI's mandate includes safeguarding, administering and advancing the rights and benefits of the Inuit of Nunavut

NTI uses a map selection system for the acquisition of mineral rights. Interested parties submit to NTI an expression of interest which includes a map of the proposed exploration area. Expressions of Interest and subsequent correspondence and negotiation are kept confidential by NTI and the applicable RIA until required to be made public, typically upon signing of a Mineral Exploration Agreement between NTI and the applicant.

Although the process described above normally applies, NTI, as a private organization, has complete discretion as to whether it will issue an MEA (or other agreement), what the process will be to obtain an agreement, and what the terms of the agreement will be. The terms may include, for example, NTI holding a direct interest option in a project or additional benefits such as shares or milestone payments.

Under the standard terms, successful applicants, upon executing the MEA and submitting the first year's annual fees, will be granted the exclusive right to explore for minerals throughout the exploration area. In order to gain access to the land, however, the applicant must first obtain a surface right such as a land use license issued by the RIA.



Holders of MEAs are required to submit annual exploration work reports to NTI that remain confidential for a period of up to three years.

## URANIUM, MINING AND RECLAMATION POLICIES

Nunavut Tunngavik Incorporated (NTI) has developed a series of policies applicable to exploration and mining, specifically a general Mining Policy, a Uranium Policy, and a Reclamation Policy. The policies provide that NTI will support exploration and mining provided:

- there are minimal negative environmental and socio-economic impacts;
- that Inuit cultural and social needs are respected;
- that investment in Nunavut is encouraged;
- that land-use conflicts are resolved equitably; and
- that Inuit economic opportunities are maximized.

The texts of all the policies are available from NTI.

## PROJECTS ON INUIT OWNED LANDS (IOL)

Many of the advanced exploration projects in Nunavut fall on IOL parcels for which NTI is the mineral title owner. The adjacent table summarizes some of the current active MEAs and their locations.

### NTI DEPARTMENT OF LANDS, AND RESOURCES

PO Box 1269  
Cambridge Bay, NU X0B 0C0  
t: 867 983 5600  
f: 867 983 5624

Carson Gillis, Director  
e: cgillis@tunngavik.com

Jorgan Aitaok, Senior Advisor, Minerals,  
Oil and Gas Management • e: jaitaok@tunngavik.com

Miguel Chenier, Senior Advisor, Lands Administration,  
Planning and Management • e: mchenier@tunngavik.com

Chris Kalluk, Manager  
Geographic Information Systems  
e: ckalluk@tunngavik.com

#### WEBSITES:

<http://ntilands.tunngavik.com>  
Department of Lands and Resources

[www.tunngavik.com](http://www.tunngavik.com)  
Nunavut Tunngavik Incorporated

<http://gis.ntilands.com/iolis>  
NTI Lands, Interactive Maps & Data

**Grandfathered Leases** are Mineral Leases which were established on Crown land that then became IOL after the Nunavut Agreement was signed. The leases continue to be managed by the Crown, although the leases' rental fees and royalty are transferred to Nunavut Tunngavik Inc.

PROJECTS ON INUIT OWNED LAND	
Kitikmeot Region	
High Lake <sup>1</sup>	MMG Limited
Hope Bay <sup>2</sup>	TMAC Resources Inc.
Hood River	Inukshuk Exploration, WPC Resources Ltd.
WestKit	NRC Exploration Incorporated
CB57	Victoria Copper Inc.
Kivalliq Region	
Angilak/Lac Cinquante	Kivalliq Energy Corporation
Amaruq	Agnico Eagle Mines Limited
Meadowbank <sup>3</sup>	Agnico Eagle Mines Limited
Meliadine <sup>4</sup>	Agnico Eagle Mines Limited
North Thelon Project/ Ukalik	Forum Uranium Corp.
RI12	Meliadine Gold Ltd.
Qikiqtani Region	
SQ-05	Canadian Orebodies Ltd.
Mary River <sup>5</sup>	Baffinland Iron Mines Corporation

1. The project involves Crown land and land held under NTI MEAs and grandfathered leases.
2. The Boston deposit is located on surface IOL, while the Doris, Madrid, South Patch, Naartok, and Suluk deposits are on subsurface IOL, distributed among grandfathered leases and NTI MEAs. Potential extension of the Boston deposit down-dip or along strike to the north will also be on subsurface IOL.
3. The project involves land held under NTI MEAs, grandfathered leases, and the Vault Mineral Production Lease issued by NTI.
4. The project involves land held under NTI MEAs as well as grandfathered claims and leases.
5. The Mary River mine is located on a grandfathered lease. Additional showings and deposits in the area are located on a mixture of subsurface IOL and Crown land





The Canada-Nunavut Geoscience Office (CNGO) is a unique government entity within Canada and serves as Nunavut's 'de-facto' Geological Survey, with Nunavut being the only Canadian jurisdiction without a formal geological survey.

Before Nunavut became a territory in 1999, over 70% of it was inadequately mapped, and its geology was poorly understood. This reality meant that informed decisions about land-use planning or exploration could not be made in many cases. To address these deficiencies, in 1999 the federal and territorial governments opened CNGO to spearhead and improve geological research in Nunavut, and to help coordinate the research conducted by geoscientists within the various governments.

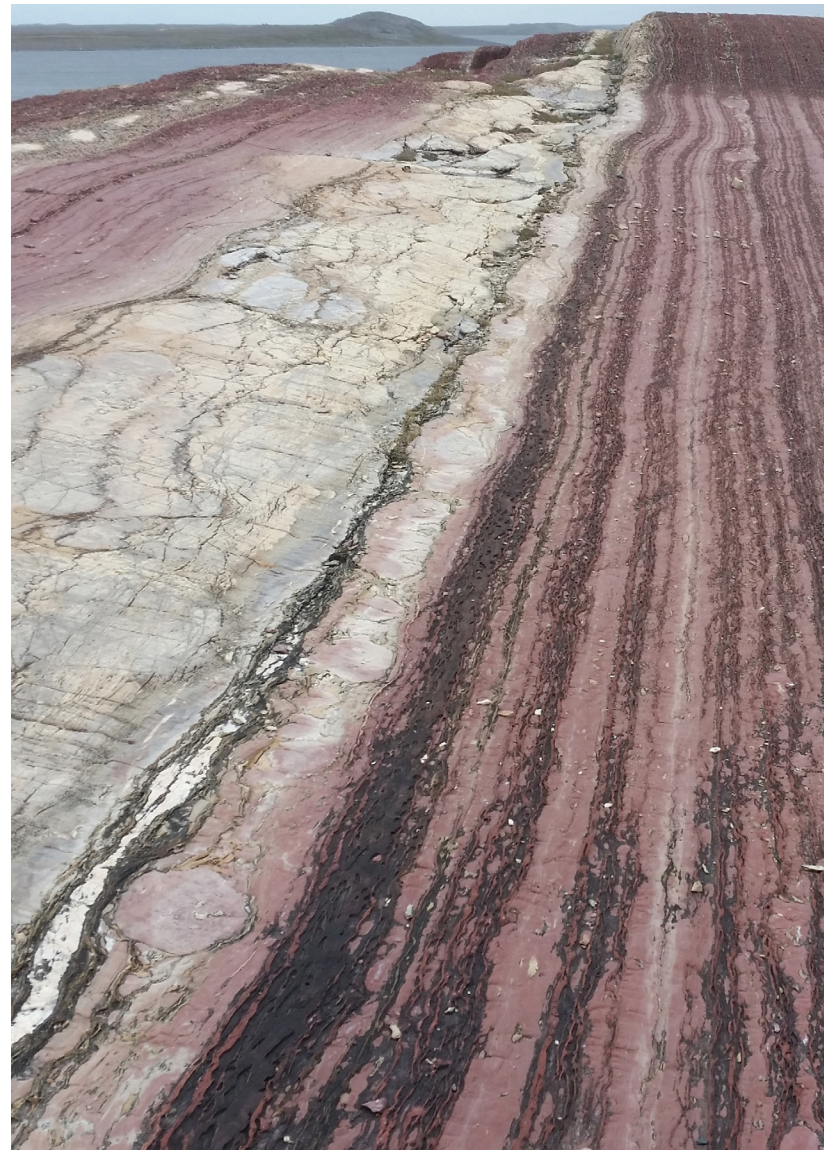
The CNGO is unique in that it is co-funded by two federal departments – Natural Resources Canada (NRCan) and Indigenous and Northern Affairs Canada (INAC) as well as the Government of Nunavut's Economic Development and Transportation (GN-EDT). The office is managed with input from a Management Board made up of representatives from NRCan, INAC, GN-EDT and Nunavut Tunngavik Inc. (ex-officio).

The CNGO's mandate is to:

- develop capacity in geoscience;
- maintain an accessible geoscience knowledge base;
- promote sustainable development of Nunavut's mineral and energy resources; and
- increase awareness of the importance of earth science for Nunavummiut. The CNGO professionals map, interpret and report on the geological features and resources of Nunavut in collaboration with other geoscientists, academics, the public and other stakeholders.

The CNGO operates on annual contributions from the funding partners and conducts additional work and research using Strategic Investments in Northern Economic Development (SINED) funding from the Canadian Northern Economic Agency (CanNor). The office currently consists of six professionals with expertise in Precambrian, Paleozoic and Quaternary geology, Geographic Information System, and on-line geoscience-data dissemination.

The CNGO has conducted much research under several SINED agreements. There have been three SINED agreements to date: 2004-2009, 2009-2014, and 2014-2016, with a fourth announced for 2016-2018. Activities for the next two years are focused on four key areas that include:



Red interbedded, iron-bearing dolostone and silty dolostone layers interrupted by a stromatolitic bed in the Mavor Formation, Belcher Islands – Courtesy of QIA

- geoscience (mapping) for responsible natural resource development;
- geoscience (mapping) for climate change and permafrost;
- geoscience (mapping) for infrastructure; and
- data dissemination, capacity building and public outreach.

Collaborative geoscience initiatives were also conducted in 2016 with the second phase of NRCan's Geo-Mapping for Energy and Minerals (GEM 2) program 2013-2020. Summaries of each project are provided below; more detailed papers with preliminary observations and interpretations are included in the *Summary of Activities 2016* volume that is available for download at [www.cngo.ca](http://www.cngo.ca).





Fractured chilled margin on a Haig intrusive sill in dolostone beds of the Costello Formation, Belcher Islands  
– Courtesy of L. Timlick, University of Manitoba

## GEOSCIENCE PROJECTS FOR RESPONSIBLE NATURAL RESOURCE DEVELOPMENT

### TEHERY LAKE-WAGER BAY BEDROCK MAPPING (CONTINUING PROJECT)

A project in the area between Chesterfield Inlet and Wager Bay, Nunavut, has been successfully conducted as a joint CNGO/NRCan-Geological Survey of Canada (GSC) regional mapping project under Geo-Mapping for Energy and Minerals (GEM 2) programming. Two field seasons (2014 and 2015) of 1:100,000-scale bedrock and surficial geology mapping were undertaken. Given the large study area and limited length of the field mapping seasons, a third and final season (summer 2016) of targeted mapping was conducted to complete this joint project. This mapping at the more detailed scale has resulted in the identification of new rock types, refinement of previous work, and identification of surficial (glacial till) features. The work is building on the work to date of upgraded and modernized bedrock information, and will provide the fundamental geoscience information that is required by all stakeholders – the exploration industry and different levels of government (federal, territorial, and municipal) – for understanding the geology in the Tehery Lake-Wager Bay area.

### PALEOZOIC STRATIGRAPHY AND PETROLEUM POTENTIAL STUDIES FOR BAFFIN BAY AND EASTERN ARCTIC ISLANDS (CONTINUING PROJECT)

There are well-known oil seeps along the Baffin Shelf area (i.e., Scott Inlet Basin) that have interested researchers and

politicians for decades as to their origin and significance. The Scott Inlet Basin contains an active petroleum system with significant potential for a viable hydrocarbon discovery.

Mapping of the area is sparse; continued research would improve the understanding of the geological history of the area. Paleozoic stratigraphy on southern Baffin Island was studied by Shunxin Zhang during GEM 1 programming. Her work has proved that both the Paleozoic petroleum source rocks on southern Baffin Island and the Mesozoic source rocks in the Baffin Shelf area are immature, and, therefore, cannot be the source rocks for these petroleum seeps. These studies continue; results to date suggest that the oil seeps in Baffin Shelf area may have originated from the Paleozoic source rocks that have been deeply buried by Mesozoic rocks.

### HUDSON UNGAVA PROJECT, HYDROCARBON IDENTIFICATION (CONTINUING PROJECT)

The CNGO has been collaborating with NRCan-GSC researchers in evaluating the hydrocarbon potential of the Paleozoic rocks in Hudson Bay, Foxe Basin and Ungava Bay area since GEM 1 programming started in 2008. For GEM 2, the CNGO (Shunxin Zhang) has been studying the Paleozoic stratigraphy and Paleozoic source rock potential under the GEM-funded Hudson-Ungava Project. Identifying any hydrocarbon system requires a detailed and accurate stratigraphic model. GEM 1 programming advanced the scientific knowledge of the stratigraphy in Hudson Bay and Foxe Basin area, but the Ungava Bay area has remained untouched. Akpatok Island (south of Baffin Island in the northern portion of Ungava Bay) is the only location in Ungava Bay where the Paleozoic rocks are exposed. The stratigraphic framework, the age of the Paleozoic strata, the stratigraphic position of petroleum source rocks on Akpatok Island, and the correlation with Hudson Bay and Foxe Basin all remain unresolved. Continuing work by Shunxin Zhang is refining the stratigraphy and determining the precise stratigraphic position of the potential hydrocarbon source rocks on Akpatok Island; this research will include high-resolution stratigraphic correlations, continued geochemical and other studies.

### CARVING STONE ASSESSMENT (CONTINUING AND NEW PROJECT)

In 2007, the GN-EDT released *“Ukkusikjaqtarvik: The Place Where We Find Stone”*, the Carving Stone Supply Action Plan. Since 2010, the GN-EDT had led an evaluation program with close collaboration with the CNGO, GSC and academic partners. The Nunavut Carving Stone Deposit Evaluation Program (2010-2014) ended in 2014, with 119 carving stone sites evaluated and documented in the

vicinity of 23 communities across Nunavut. The Qikiqtani Inuit Association (QIA) is the land owner of all Inuit Owned Land (IOL) within the Qikiqtaaluk (Baffin) under the authority of the Nunavut Agreement. The QIA proposed a project to CanNor for 2016-2017 to evaluate three well-known carving stone quarries that are generally regarded as being essential to the long term survival of the carving industry in Nunavut. Geologists in GN-EDT and CNGO provided the necessary geological expertise to map and assess resource levels for these deposits. Prospecting and mapping was undertaken in 2016 by Holly Steenkamp (CNGO) to assist the QIA with this project on the Qullisajaniavvik site near Sankikiluaq. Additionally, a one-week mapping project by a fourth year honours student assisted with the mapping.

#### **MAPPING USING NEW SPECTRAL AND HIGH RESOLUTION SATELLITE DATA (NEW PROJECT)**

Nunavut covers a land area of over 2 million km<sup>2</sup> and hosts some of the most prospective mineral exploration ground in the world. Short seasonal access and high costs of mounting and carrying out exploration programs are major deterrents to advancing many projects. In the late 1990s and early 2000s, exploration companies successfully used airborne hyperspectral imaging technology to survey vast areas. Although the resulting analysis of the survey data proved successful for identifying mineralized targets, the high and increasing costs of these surveys in remote areas has limited their application to a few well-funded projects.

Projects under earlier SINED programming led by Paul Budkewitsch (NRCan, then INAC) and carried out by CNGO in collaboration with GN-EDT and then-AANDC (now INAC) involved a 'proof-of-concept' study in 2012 and a subsequent 'demonstration' project developed in 2014-2016. For 2016-2017, an area was chosen for further study using new spectral and high resolution satellite data. This area is over the prospective Ennadai-Rankin greenstone belt of rocks in the southern Kivalliq and covers approximately 5,800 km<sup>2</sup>, the equivalent of eight 1:50,000 scale NTS map sheets. There is renewed interest in gold, precious metals, nickel, platinum-group elements and base metals within this greenstone belt. This space-borne high resolution technology can provide cost-savings by a factor of three to ten times over airborne campaigns.

#### **METAL EARTH PROJECT AND CANADA FIRST RESEARCH EXCELLENCE FUND (CFREF) (NEW PROJECT)**

The Metal Earth program is a Canadian Research and Development Program led by Laurentian University. Researchers in this program have varied interests and represent academia, Canadian and international research

centres, government and industry. The Metal Earth program successfully applied to the Canada First Research Excellence Fund (CFREF) for funding to conduct field-based studies to understand the genesis of base and precious metal deposits and focusing primarily on deposits occurring in Precambrian rocks. The western portion of Nunavut is underlain by rocks of the (Precambrian) Archean Slave Geological Province, and within the Slave Craton lie some of Nunavut's, and Canada's, best deposits and prospective rocks. Examples of these include: the Hope Bay Greenstone Belt, which hosts several world-class gold deposits; the High Lake and Izok base metal deposits; the Hackett River base metal deposit; and the George and Goose gold deposits. The Hope Bay belt, in particular, has the potential to host more as of yet undiscovered deposits and become a world-class mining district.

CNGO was approached by researchers of the Metal Earth Project to endorse the application and funding request to the CFREF. CNGO is supporting joint projects under CFREF and the Metal Earth program with graduate students and post-doctoral fellows working in the Slave Craton starting in 2016-2017.



Representative Paleozoic stratigraphy at Akpatok Island  
– Courtesy of CNGO



## GEOSCIENCE PROJECTS FOR CLIMATE CHANGE AND PERMAFROST

### TILL GEOCHEMICAL AND HEAVY MINERAL SURVEYS BOOTHIA PENINSULA AND SOMERSET ISLAND (NEW PROJECT)

For 2016-2018, new till geochemical and heavy mineral surveys are proposed to be conducted over the Boothia Peninsula and Somerset Island. This proposed work for CNGO is being undertaken in collaboration with NRCan's Boothia-Somerset Project: Integrated geoscience along the Northwest Passage GEM 2 project. Bedrock and surficial mapping will be conducted across the Boothia Peninsula and Somerset Island with a focus on changing climate impacts and efforts along the coastal areas. The results will provide modern, integrated geoscience for the underexplored, politically important Northwest Passage region. The key work in 2016 was an aeromagnetic survey (by NRCan) that will allow bedrock mapping (2017) to be targeted, particularly where rock outcroppings coincide with magnetic anomalies. Using the aeromagnetic data, geological units can be extrapolated across till-covered areas and beneath Paleozoic sedimentary cover. Collaborative work will be done in 2017 with Tommy Tremblay for drift (surficial and till) prospecting for locating indicator minerals (gold, base metals, kimberlites) and to study ice-flow directions for glacial history that will provide key data for evaluating mineral resource potential. Additional collaborative work will be undertaken with Shunxin Zhang to refine the Paleozoic stratigraphy of this area.

### WESTERN HUDSON BAY: PERMAFROST-INFRASTRUCTURE ANALYSIS AND SUSCEPTIBILITY TO EFFECTS OF CLIMATE CHANGE AND WARMING CONDITIONS (CONTINUING AND NEW PROJECT)

Climate change and warming conditions are occurring in the North. Although permafrost is an important feature of the western Hudson Bay area landscape, there has been only limited permafrost monitoring and studies along this coast of Nunavut. Any decisions that need to be made concerning future infrastructure development are hindered by limited baseline information such as current permafrost conditions. Significant new infrastructure developments and the maintenance of existing older infrastructure in the western Hudson Bay region are being considered to support the natural resource sector and communities for economic development. CNGO began a geoscience surficial map compilation project in 2014 for an area ('corridor') approximately 50 km wide along the western Hudson Bay coast extending from the Manitoba border to Rankin Inlet (NTS map sheets 55D, 55E, 55F, 55K, 55L). The objective was to compile all existing aggregate, mineral potential, surficial and permafrost data for this area. These surficial



Participant panning for gold as part of Pilot Community Field School Initiative, Taloyoak – *Courtesy of NRCan-GSC*

geology and permafrost studies will use satellite images (Radarsat dINSAR™, RapidEye™) for the map compilation and interpretation. Additional permafrost monitoring is being undertaken in Rankin Inlet and selected areas, in collaboration with NRCan-GSC under GEM 2 programming.

## GEOSCIENCE FOR PROTECTING INVESTMENTS IN INFRASTRUCTURE

### MAPPING AND CHARACTERIZATION OF THE SEABED OF FROBISHER BAY

Coastal regions of the Canadian Arctic face increasing pressures from climate change, resource exploitation, and infrastructure development. These pressures come together in a crucial region of the Eastern Arctic in Frobisher Bay. Frobisher Bay is adjacent to the rapidly growing city of Iqaluit and is one of the few locations in the Canadian Arctic with a long history of geological and ecological study, providing long-term datasets and study areas. The bay presents interesting new opportunities and challenges, including the possibility of hydroelectric power generation. Frobisher Bay faces potential impacts from expanding commercial and subsistence fisheries, expanded terrestrial mining, increasing marine traffic, and infrastructure development for both the city and the proposed new port at Iqaluit. Currently, freight arriving by sealift is brought ashore across the tidal flats at

the head of Koojesse Inlet. Overall, the seabed dynamics, erosional processes, and sedimentation rates in the inner harbour remain poorly understood.

Combined bathymetric, geological and ecological seabed mapping provides a means to understand and manage these potential impacts in an integrated fashion. A medium-sized bay such as Frobisher Bay is large enough to encompass a wide variety of coastal and shallow marine environments and a wide range of human activities and potential stressors, yet small enough to be mapped in its entirety. Infrastructure requirements for Iqaluit, for the GN, and for expanding facilities of the proposed port of Iqaluit place additional possible stressors on Frobisher Bay. These stressors could be excessive yield of nutrients, spills, and introduction of invasive species. Data collection has been ongoing for many years through ArcticNet, a consortium of various partners. Starting in 2014, the CNGO is participating in, and supporting, this ArcticNet project using the GN's RV *Nuliajuk* research vessel.

#### **MAPPING AND CHARACTERIZATION OF THE SEABED OF FROBISHER BAY TO SUPPORT INFRASTRUCTURE DEVELOPMENT, EXPLORATION AND NATURAL HAZARD ASSESSMENT**

In 2014 and 2015, CNGO, GN-EDT, GN-Department of Environment (DoE) and NRCan (GSC-Atlantic) contributed to the larger seabed mapping project referred to above with another initiative using SINED funding from CanNor and other funding through NRCan's Program of Energy Research and Development (PERD). Using the GN-DoE's RV *Nuliajuk* vessel, CNGO, GN-EDT, GN-DoE and NRCan-GSC (Atlantic) collaborated to map the seabed of Frobisher Bay. The main objective of the work is to provide key geoscience data that will help define risks to infrastructure development, and to determine corresponding solutions that will be required to build and maintain such infrastructure. Using multibeam sonar technology on the *Nuliajuk*, the seabed floor can be characterized and assessed for geohazard. This geoscience work continued in 2016. Exploration and development work around Frobisher Bay includes the Chidliak diamond property, potential hydro-electric development at Jaynes Inlet and Armshow River South, a proposed fibre-optic data cable, and the construction of a new deep water port. To plan for and support these developments, marine geoscience information is required. Additionally, studies into near-shore ice, tidal currents, iceberg scour, submarine landslides, natural gas or petroleum seeps, wave exposure, and coastal stability will be conducted to better understand and maintain existing facilities, construct new infrastructure, and determine the

viability of channel approaches. Natural seabed (geo-) hazards in the bay may affect port infrastructure development, which in turn has the potential to trigger submarine slope failure and sediment mass transport events.

#### **DATA DISSEMINATION**

One of the key ingredients of a successful mining and exploration jurisdiction is the availability of public geoscience information. Industry, governments and the public require free, well-managed and publicly web-accessible data to make sound investment decisions and understand resource potential. Any programming and research work and the collected data and results are made available to the public and all stakeholders. For Nunavut researchers, including the GN-EDT and CNGO, this information to be disseminated involves geoscience information that is available for Nunavut, including results of geological mapping (bedrock and surficial), analytical results from sampling (rock, till, soil, lake sediment and stream sediment samples), and reports and publications from CNGO.

CNGO and its partners co-manage and disseminate data through two websites ([cngo.ca](http://cngo.ca) and [Nunavutgeoscience.ca](http://Nunavutgeoscience.ca)) and two CNGO publications (Summary of Activities and the Geoscience Data Series).

#### **CONTACTS**

Canada–Nunavut Geoscience Office  
1106 Inuksugait Plaza, 1st Floor  
PO Box 2319  
Iqaluit, NU X0A 0H0

Linda Ham, Chief Geologist  
t: 867 975 4412 • e: [linda.ham@canada.ca](mailto:linda.ham@canada.ca)

Serge Basso, Geotechnology Analyst  
t: 867 975 4529 • e: [serge.basso@canada.ca](mailto:serge.basso@canada.ca)

Celine Gilbert, GIS Specialist  
t: 867 975 4414 • e: [celine.gilbert@canada.ca](mailto:celine.gilbert@canada.ca)

Holly Steenkamp, Bedrock Geology  
t: 867 975 4533 • e: [holly.steenkamp@canada.ca](mailto:holly.steenkamp@canada.ca)

Tommy Tremblay, Surficial Geology  
t: 867 975 4505 • e: [tommy.tremblay@canada.ca](mailto:tommy.tremblay@canada.ca)


Dr. Shunxin Zhang, Paleozoic Geology  
t: 867 975 4579 • e: [shunxin.zhang@canada.ca](mailto:shunxin.zhang@canada.ca)

[www.cngo.ca](http://www.cngo.ca)

[www.nunavutgeoscience.ca](http://www.nunavutgeoscience.ca)



# Kitikmeot Region



Kilometres

Projection: Canada Lambert Conformal Conic, NAD 83

Fruit	Number of people
Apple	250
Mango	150
Orange	100
Guava	100

Kilometres

Projection: Canada Lambert Conformal Conic, NAD 83





## THE KITIKMEOT REGION

The Kitikmeot region occupies the westernmost area of Nunavut. The region encompasses the mainland and islands of the Northwest Passage including parts of Victoria, Prince of Wales, and Somerset Island, all of King William Island and the Boothia Peninsula. It is the second largest administrative district in Nunavut and covers an area of 446,728 square kilometres. Cambridge Bay is the largest community in the region with a population of over 1,600; other communities in this region are Kugluktuk, Taloyoak, Kugaaruk, and Gjoa Haven. Most of the logistical support for work in the region comes through Yellowknife, capital of the Northwest Territories.

The geology of the Kitikmeot region is dominated by Archean and Proterozoic-Age rocks of the Bear, Slave and Churchill provinces, and by the Paleozoic Arctic Platform in the north. Gold, base metals, uranium, platinum group elements, and diamonds have all been discovered throughout the region. The focus of exploration in 2016 was primarily for gold, and a lesser amount for diamonds. Four past-producing mines are located in the Kitikmeot region: Roberts Bay and Ida Bay silver mines, located in the Hope Bay area, and the Lupin gold mine and Jericho diamond mine, located near Northwest Territories border.

Although some analysts were forecasting a rebound in exploration levels for 2016, this did not materialize, with the Kitikmeot region seeing limited gold and diamond exploration. An encouraging sign was a new proponent assembling a portfolio of gold properties in the territory. As of November 2016, an estimated 2.0 million hectares (ha) are being held in mineral claims, prospecting permits and leases in the Kitikmeot region. Approximately 270,000 ha of new mineral claims and prospecting permits offset 143,000 ha of cancelled claims.

TMAC's Hope Bay gold project is the largest precious metal project in the Kitikmeot region. Production from its flagship Doris deposit is to commence in early 2017. In 2016, the company transported, off-loaded and installed the processing plant for planned commissioning in December 2016. Upgrades to the Hope Bay airstrip were also completed to accommodate larger aircrafts. In addition to construction, TMAC carried out exploration programs at its "Below the Dyke" zone at Doris North, the Madrid trend and the Elu Belt to the east of Hope Bay. TMAC also received an amended Doris North project certificate, marking the completion of the Nunavut Impact Review Board (NIRB) environmental assessment process. The Nunavut Water Board announced a positive decision on the water licence amendment in November 2016 which is awaiting Ministerial review and signature at time of writing.



Jumbo drill in Doris North underground mine workings  
– Courtesy of TMAC Resources Inc.

In the eastern Kitikmeot, Auryn Resources Inc. embarked on an aggressive staking and exploration program on its Committee Bay gold project. The company staked over 160,000 ha, expanding its land package to more than 380,000 ha. Auryn also completed rotary air blast and diamond drilling programs, and field exploration consisting of till sampling, boulder train mapping, and drone imagery surveying, covering over 3,500 km<sup>2</sup>. Plans for the 2017 exploration program include 25,000 m of drilling to test new significant targets delineated during the 2016 program.

Sabina Gold & Silver Corp. completed a modest spring drill program which focused on testing three mineralized zones within the Goose property. The program consisted of 16 short diamond drill holes and produced a new discovery in the vicinity of the Convergence prospect with an intercept of 3.84 grams per tonne gold over 3.7 m. In June 2016, the NIRB issued its determination to the Minister of Indigenous and Northern Affairs recommending that Sabina's Back River project not proceed to the licensing and permitting regulatory phase at this time. The Minister's response is pending at time of writing.

Silver Range Resources Inc. is a new entrant to Nunavut mineral exploration in 2016 that has assembled a portfolio of six gold exploration properties in the Kitikmeot and Kivalliq regions. Four of these properties are located in the vicinity of the proposed Grays Bay road, with the remaining two located in the western and eastern Kivalliq.

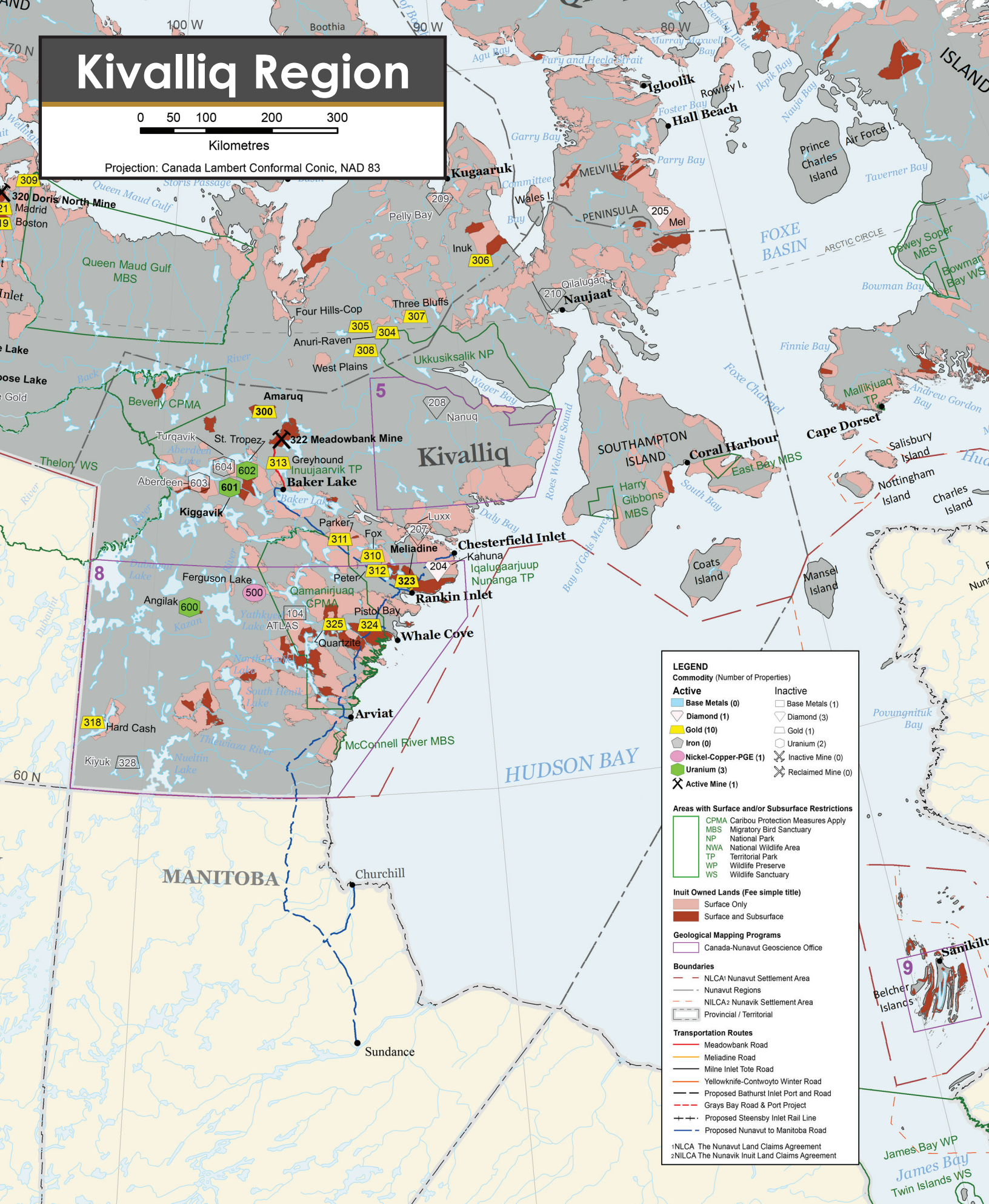
In preparation for the planned release of a NI 43-101 compliant Technical Report on its Muskox diamond project in Q4 of 2016, Crystal Exploration embarked on a limited exploration program. This program consisted of till and rock sampling, prospecting and mapping, as well as a ground geophysical survey conducted over 17 targets located in the Muskox, Contwoyto and Hood project areas. Results from these studies are pending at time of writing.



# Kivalliq Region

0 50 100 200 300  
Kilometres

Projection: Canada Lambert Conformal Conic, NAD 83





## THE KIVALLIQ REGION

The Kivalliq is the central region of Nunavut on the west coast of Hudson Bay, and at 445,109 km<sup>2</sup>, is the smallest in the territory. The Kivalliq region shares its western and southern border with Northwest Territories and Manitoba, respectively. All communities in the Kivalliq region – Arviat, Baker Lake, Chesterfield Inlet, Coral Harbour, Nauyasat, Rankin Inlet, and Whale Cove – benefit from investment in the region with Rankin Inlet and Baker Lake being the main communities for staging of exploration activities. In 2016, exploration in the Kivalliq region mainly focused on gold, diamonds and uranium.

The bedrock geology is characterized by Archean and Proterozoic plutonic rocks, major Paleoproterozoic sedimentary basins, and numerous greenstone and metasedimentary belts of the Western Churchill Province (the Rae and Hearne domains). Younger Paleozoic strata of the Hudson Bay Lowlands are found in the east and cover parts of Southampton and Coats islands. The diverse geology of this region hosts a number of significant mineral occurrences and deposits including gold, uranium, diamonds, nickel, and platinum group elements.

The Kivalliq region has a long history of mining, with two past-producing mines: the North Rankin Nickel Mine at Rankin Inlet, and the Cullaton-Shear Lake gold mine north of Nueltin Lake. As of November 2016, an estimated 1.78 million hectares (ha) are held in mineral claims, prospecting permits and mining leases in the Kivalliq region. More than 32,000 ha of new mineral claims were staked and one new lease (209 ha) was registered in 2016, but more than 458,000 ha of claims were cancelled, many of which were at the end of the ten year claim life.

About 80 km due north of Baker Lake is the Meadowbank gold mine operated by Agnico Eagle Mines Limited, which opened in 2010. The open pit mine has been in continuous operation since opening and in 2015, produced its 2 millionth ounce of gold. In 2016, the proposed Vault pit expansion received regulatory approvals which will allow the Meadowbank mine life to be extended until late 2018. This expansion is intended to help bridge the gap in production until mining can begin at the proposed Whale Tail pit at Agnico Eagle's Amaruq project, located 50 km northwest of Meadowbank. The company anticipates that production could begin at Amaruq by 2019. In 2016 regulatory authorizations were issued to allow the construction of a 64 km all-weather access road linking Meadowbank to Amaruq. An extensive exploration drilling program in 2016 again added significantly to the gold resources at Amaruq.

Agnico Eagle also owns the Meliadine advanced gold project located 25 km north of Rankin Inlet. The company received the Type A Water Licence for the project in May 2016, and now has all permits needed to begin construction. Work in 2016 focused on expanding underground development, construction of key surface infrastructure and internal studies to optimize the project for a contemplated production start-up in 2020.

Other gold projects active in the region include Northquest Ltd.'s Pistol Bay project, where a program of mapping, till sampling and diamond drilling was carried out and a maiden inferred resource was released for the Vickers deposit, and two early-stage projects, Hard Cash and Quartzite, owned by Silver Range Resources Inc.

Dunnedin Ventures Inc. continued exploration at its Kahuna diamond project near Chesterfield Inlet, and is now also evaluating the property, proximal to Meliadine, for its gold potential.

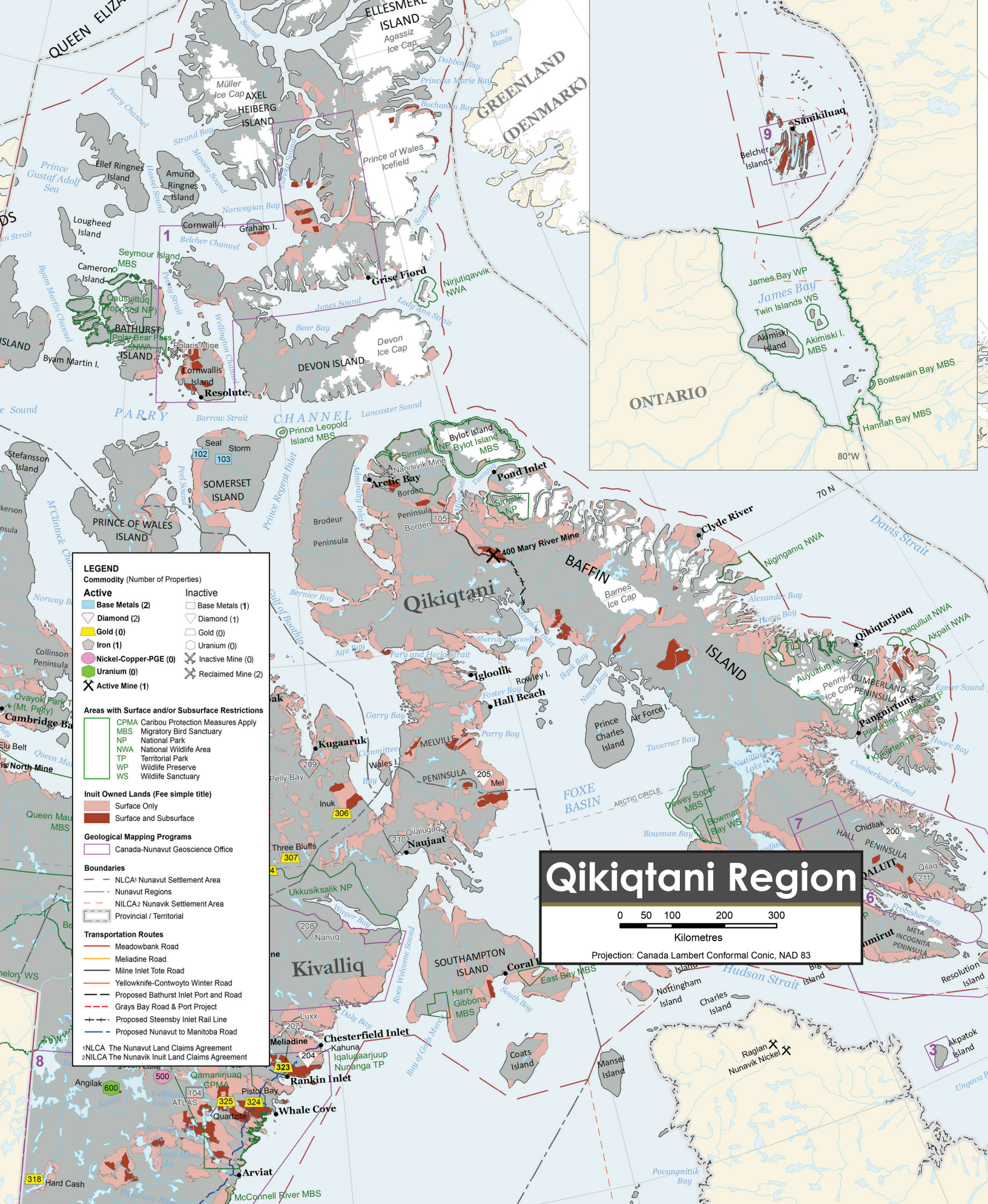
At Kivalliq Energy Corporation's Angilak project, the company carried out a program of trenching and soil sampling at the polymetallic Yat target and at Dipole. Exploration and development activities at AREVA Resources Canada Inc.'s Kiggavik uranium project have been suspended following the federal ministerial decision accepting the Nunavut Impact Review Board's recommendation that the project not proceed to licensing and permitting at this time.



Drill core laid out at Pistol Bay camp

– Courtesy of Northquest Ltd.









Milne Inlet Port – *Courtesy of Baffinland Iron Mines Corporation*

## THE QIKIQTANI REGION

The Qikiqtani region covers an area of 1,040,418 km<sup>2</sup> and is Nunavut's largest administrative district. This region is mainly comprised of the islands of the Canadian Arctic archipelago, including Baffin, Devon, Cornwallis, Bathurst, Ellesmere, and many smaller ones. The northern part of the Melville Peninsula is also within the Qikiqtani region, as are the Belcher Islands in southeastern Hudson Bay.

Iqaluit, located on southern Baffin Island, is the territorial capital, and is a major centre for exploration-related supplies and support services for the region. Other communities include Arctic Bay, Cape Dorset, Clyde River, Grise Fiord, Hall Beach, Igloolik, Kimmirut, Pangnirtung, Pond Inlet, Qikiqtarjuaq, Resolute, and Sanikiluaq; many of these communities benefit from exploration and mining projects by providing services, supplies or employees.

The Qikiqtani region is underlain by Archean and Proterozoic rocks of the Churchill Province, and Paleozoic rocks of the Arctic Platform and Innuitian Belt. The region hosts a variety of mineral deposits and occurrences, including iron, base metals, gold, platinum-group elements, diamonds, and sapphires. There are two past-producing base metal mines in the region: the Polaris zinc-lead mine on Little Cornwallis Island and the Nanisivik zinc-lead-silver mine on northern Baffin Island near the community of Arctic Bay. In 2016, exploration and mine development in the Qikiqtani region was focused on diamonds, iron, and base metals. As of November 2016, an estimated 3.4 million hectares (ha) of mineral claims, prospecting permits and mining leases were held, including more than 245,000 ha of mineral claims and prospecting permits issued that year. Approximately 68,000 ha of mineral claims were cancelled in 2016.

The Mary River iron mine, owned by Baffinland Iron Mines Corporation, has been in production since late 2014 and sent its first shipment of iron ore to market in August 2015.

An estimated 2.7 million tonnes of iron was shipped from the Milne Inlet Port in 2016. The company has been seeking an amendment, the Phase 2 proposal, to its project certificate that would allow the amount of ore transported to Milne Inlet for shipping to be tripled. This proposed amendment would also extend the shipping season by two months, and add a second, larger ore dock to accommodate more and larger ships. Baffinland also announced its intention to include construction of a railway from the mine site to the Milne Inlet port as part of the Phase 2 proposal, as an alternative to transporting ore by truck using the existing Tote Road.

In 2016, Peregrine Diamonds Ltd.'s focus for its Chidliak diamond project was the completion of a Preliminary Economic Assessment (PEA) for the Phase One diamond development of the CH-6 and CH-7 kimberlite pipes. Early in the year a maiden inferred resource estimate for CH-7 was completed and the existing inferred resource for CH-6 was increased based on work done in 2015. The Phase One development described in the PEA envisions a 10 year mine life at an annual average production rate of 1.2 million carats with a capital payback period of two years. The mine plan includes the construction of a 160 km, all-weather road from Iqaluit to Chidliak.

At the Storm copper project on Somerset Island, Aston Bay Holdings Ltd. reached an agreement with Commander Resources Inc. to gain ownership of the project. Following that, Aston Bay signed an option agreement with BHP Billiton, under the terms of which BHP may earn a 75 per cent interest in Storm by funding \$40 million in exploration expenditures over nine years. The 2016 field season was conducted with Aston Bay as operator, and involved diamond drilling to investigate high priority targets, re-logging of historical drill core, surface mapping and regional soil sampling. The drilling identified copper and silver mineralization from some previously untested geophysical targets.



## BASE METALS

100	ARCTIC COPPER
<b>Operator/Owner</b>	Arctic Copper Corp.
<b>Commodity</b>	Copper, Silver
<b>NTS</b>	86N08, 86N09, 86N16, 86O05, 86O10 – 86O13
<b>Land Tenure</b>	Crown, Surface IOL
<b>Location</b>	55 km southwest of Kugluktuk

Arctic Copper is a junior exploration company, wholly owned by Sitka Gold Corporation, that holds over 50,000 hectares in 45 mineral claims on Crown and Inuit administered lands in the Coppermine River district. The Coppermine River district is located in the Bear Structural Province, an Early Proterozoic volcano-sedimentary assemblage in the western Arctic. This district hosts two distinctly different styles of copper mineralization: sediment-hosted stratiform and volcanic-hosted copper and silver.

Arctic Copper's claims, acquired in April 2015, cover areas prospective for both types of the copper mineralization found in this district. The claims are spread over three separate blocks – ACG, ACJ and ACRAE – and are adjacent to Kaizen Discovery's Coppermine River property (described below). One of these blocks also holds potential for a deep, Muskox-type intrusion with possible Cu-Ni-PGE mineralization. Only two of the three blocks were examined during the initial exploration program which took place in 2015 and consisted of prospecting, mapping and a ground gravity geophysical survey. The program resulted in the discovery of a new showing, the "Copper Leaf" showing in the ACG block.

The Copper Leaf showing, measuring approximately 3 m by 12 m, is an elongated zone mineralized with patchy disseminated chalcocite. Grab samples, collected from this new showing and frost boils in its vicinity, contained disseminated to massive chalcocite and malachite mineralization hosted in Husky Creek sandstone proximal to gabbro dyke. Samples were collected over a 2 km strike length along the gabbro-sandstone contact extending southward from the Copper Leaf showing. The samples returned assay values of up to 13.45% Cu and 11 grams per tonne silver (g/t Ag) with an average grade of 4.47% Cu and 17.8 g/t Ag. A gravity survey was conducted over this new showing and consisted of a single gravity transect over barren

and mineralized Husky Creek sedimentary rocks. The survey distinguished a gravity anomaly over mineralized boulders in frost boils surrounded by barren sediments. Brecciated and vein zones adjacent to the gabbro dyke were also sampled and returned assay values of up to 5.88% Cu and 16 g/t Ag. Additional sampling in the ACG block was conducted over the volcanic- and sedimentary hosted historical prospects with assays of up to 0.76% Cu.

Volcanic-hosted, structure controlled copper and silver mineralization was targeted in the ACJ claim block. This block contains several historical showings on strike with June Copper Lode zone located on Kaizen-controlled ground. The sampling in 2015 from one of the showings, Bet, resulted in assays of up to 17.74% Cu and 15 g/t Ag. Selective sampling over another showing, Liz, returned values of up to 10.95% Cu and 53 g/t Ag, with rocks from the Win showing returning assay values of up to 40% Cu and 36 g/t Ag. A ground gravity survey was conducted over a single transect, but results were inconclusive.

Although the company applied for permits necessary to conduct an exploration program on its Coppermine Project in 2016, Arctic Copper did not conduct any exploration activities.

101	COPPERMINE RIVER
<b>Operator/Owner</b>	Kaizen Discovery Inc.
<b>Commodity</b>	Copper, Silver
<b>NTS</b>	86N07 – 86N11, 86N14 – 86N16, 86O11 – 86O14, 87A04, 87B01
<b>Land Tenure</b>	Crown, Surface IOL
<b>Location</b>	45 km southwest of Kugluktuk

Kaizen Discovery, a Vancouver-based junior exploration company with financial backing of Japanese strategic partners, acquired Tundra Copper in 2014 with its 350 square kilometres land area covering volcanic-hosted mineralization. Kaizen increased its land package to approximately 3,500 km<sup>2</sup> through staking and prospecting permit applications to cover areas prospective for sediment-hosted copper mineralization.

In 2015, Kaizen embarked on a field program which included staking, drilling, mapping and prospecting, and targeted both types of copper mineralization found on the property. Regional



Copper mineralization in core at Storm – Courtesy of Aston Bay Holdings Ltd.

scale prospecting resulted in the discovery of nine new copper showings. The company completed nine diamond drill holes (a total of 2,060 m) with the majority of the drilling targeting the sediment-hosted stratiform copper mineralization known to occur at the base of the Rae Group. Seven regionally-spaced diamond drill holes totaling 1,949 m tested the targets that cover approximately 40 km of favorable lithology west of historical drilling completed in the 1960s and 1990s.

Two holes targeted the volcanic-hosted mineralization located on two southern claim blocks outside of the main land package. These two claim blocks cover several historical showings including the Dick showing with up to 10.20% Cu and 17 grams per tonne silver (g/t Ag) over 3.6 m, the Larry showing with 3.48% Cu and 8 g/t Ag over 8 m, and the Jack, Lloyd, Lars and Cu-Tar showings with assays of up to 22.3% Cu over narrow widths. These holes totaled 111 m and returned values of up to 1.1% Cu and 2.46 g/t Ag over 9.3 m and 1.0% Cu over 3 m.

Kaizen Discovery did not conduct any exploration on its Coppermine project in 2016 following management changes in the first half of 2016.

102 <sup>1</sup> 103 <sup>2</sup>	SEAL <sup>1</sup> STORM <sup>2</sup>
<b>Operator/ Partner</b>	Aston Bay Holdings Ltd., BHP Billiton Ltd. <sup>1,2</sup>
<b>Commodity</b>	Zinc Silver <sup>1</sup> ; Copper <sup>2</sup>
<b>NTS</b>	58C11 – 58C14 <sup>1</sup> ; 58B14, 58B15, 58C02, 58C03, 58C06, 58C07, 58C10 – 58C14, 58F04 <sup>2</sup>
<b>Land Tenure</b>	Crown, Surface IOL <sup>1,2</sup>
<b>Location</b>	105 km south of Resolute <sup>1</sup> ; 120 km south of Resolute <sup>2</sup>

Aston Bay Holdings Ltd., a junior exploration company active in the territory since 2011, saw some major changes and developments in 2016 on its Storm project located in the northwest part of Somerset Island. The project encompasses two major prospects, Storm Copper and Seal Zinc, and is adjacent to tidewater close to active shipping lanes. The property consists of over 395,000 hectares (ha) in mineral claims and prospecting permits, including 135,546 ha in six prospecting permits acquired in February 2016, and covers the entire 140 km strike length of the mineralized belt. Stratabound copper mineralization is hosted in brecciated zones within dolomitic sediments of the Allen Bay Formation. Mineralization consists of copper oxides (malachite, azurite and chalcocite), bornite and chalcopyrite.

Since 2014, the company has focused its exploration activities on the Storm Copper prospect. Historical exploration included over 9,000 metres (m) of diamond drilling, prospecting, mapping and a fixed-wing, time-domain electromagnetic and magnetic survey. Results from this historical work were included in a database acquired by the company in 2013 from Teck Resources. Some of the historical drill intercepts included 11.8% Cu over 5.1 m; 56 m of 3.07% Cu; and 110 m of 2.45% Cu. With historical drill holes averaging a length of 100 m, most of the mineralized zones were only tested in the uppermost 100 m and remain open at depth. Re-interpretation of the historical geophysical and geological data led Aston Bay to identify several high-priority, and numerous lower-priority, targets, which were examined during the 2015 ground gravity survey.



Antofagasta plc had signed an “Earn-In Agreement” with Aston Bay in 2014 but in January 2015 terminated the agreement. In December 2015 Aston Bay consolidated the ownership of its Storm property by signing an agreement with Commander Resources, from whom Aston Bay had formerly optioned the project. Following that transaction, in January 2016, Aston Bay signed a Letter of Intent with BHP Billiton, in a deal which would enable BHP to earn a 75 per cent interest in the Storm project by spending \$40 million in exploration over the next nine years with \$2.5 million to be spent in the first two years of the deal. The agreement was closed in August, 2016. Under the terms of the agreement, Aston Bay would remain the operator during the 2016 program, with BHP free to assume operatorship at any time. BHP Billiton also has no required exploration expenses in the first four years of the agreement.

In October 2016, Ashton Bay released partial results from its summer Storm Copper exploration program. Twelve drill holes (1,951 m) targeted the Tornado and Hurricane prospects and other geophysical and structural targets. Some of the highlights of the program included drill intercepts of 16 m grading 3.07% Cu and 12.26 grams per tonne silver (g/t Ag), 4 metres grading 1.17% Cu and 4 g/t Ag as well as 20 m of 0.44% Cu and 1.69 g/t Ag. Drill holes were tested with downhole electromagnetic surveys and geophysical properties measurements were taken which should contribute to precise hole targeting in the future. Over 2,000 soil samples were collected on a N-S elongated area of approximately 120 km by 20-40 km; this sampling covered most of the property. Further analytical results from drill and soil samples are pending.

The last reported activity on the Seal Zinc prospect involved the collection of a 200 kilogram mini-bulk sample in 2013 for metallurgical studies. This prospect contains zinc-silver mineralization extending over 350 m along strike with widths ranging from 50 and 100 m. Assays of historical samples varied between 10% and 12% Zn and up to 40 g/t Ag, with historical drill hole intercepts of up to 18.8 m grading 10.58% zinc and 28.7 g/t Ag. The main purpose of the 2013 metallurgical studies was to advance the deposit towards a NI 43-101 compliant resource and a Preliminary Economic Assessment. This study has not been released to date.

### DIAMONDS

 200	CHIDLIAK
<b>Operator/Owner</b>	Peregrine Diamonds Ltd.
<b>Commodity</b>	Diamonds
<b>NTS</b>	25P13, 26A04, 26A05, 26A12, 26A13, 26B01, 26B02, 26B07 – 26B10, 26B15, 26B16
<b>Land Tenure</b>	Crown, Surface IOL
<b>Location</b>	120 km northeast of Iqaluit

The Chidliak diamond project is located northeast of Iqaluit, on the Hall Peninsula of Baffin Island, and is owned and operated by Peregrine Diamonds Ltd. Chidliak is the largest diamond exploration project in Nunavut, comprising 564,396 hectares of Crown and surface IOL and is the project that contains the highest number of known kimberlites in the territory.

Exploration at Chidliak began in 2005. Three areas were found with high concentrations of kimberlite indicator minerals (KIM) and in 2008, Peregrine discovered its initial three kimberlites (CH-1, CH-2, and CH-3). To date, there have been 74 kimberlites discovered with eight identified as potentially economic.

The Chidliak kimberlites were emplaced during the Jurassic period, between 157 and 139.1 Ma, and consist of steeply dipping sheet-like and larger pipe-like bodies. The sheet-like bodies are mainly coherent, hypabyssal kimberlite dykes, which may contain basement xenoliths. Most of the pipe-like bodies have, in addition to basement xenoliths, Paleozoic carbonate and clastic xenoliths. The presence of these xenoliths proves that this area was overlain by Lower Paleozoic sedimentary rocks estimated to be 270 to 305 m thick at the time of kimberlite eruption. The Chidliak pipes can be assigned broadly to two main types: those pipes containing only volcanoclastic kimberlite infill and combined-infill pipes that comprise a combination of volcanoclastic kimberlite, coherent kimberlite, and apparent coherent kimberlite. Both CH-6 and CH-7, kimberlites considered to have the best economic potential, are combined-infill pipes.

In 2014 Peregrine initiated a diamond resource definition program, with the objective of advancing three to five kimberlites showing economic potential through the bulk



Recovered diamonds from a processed bulk sample batch from the CH-6 kimberlite – *Courtesy of Peregrine Diamonds Ltd.*

sample stage to confirm sufficient diamond resources to initiate a pre-feasibility study in 2016. To that end, in 2014 Peregrine drilled 3,305 m of core at CH-6, CH-7 and CH-44, completed logistical preparation for bulk sampling by a large diameter reverse circulation (RC) drill in 2015, did an evaluation of recovered diamonds from the 2013 CH-6 bulk sample and calculated an initial inferred resource for the CH-6 kimberlite.

In the spring of 2015, Peregrine drilled six large diameter RC holes totalling 1,212.1 m into CH-7 resulting in the collection of a bulk sample totalling 814.0 dry tonnes. The summer program consisted of a six-hole diamond drill program (two into CH-6 and four into CH-7). Extensive sampling of the existing CH-6 and CH-7 core resulted in 3,345 kilograms of core being analyzed. Additionally the company released a NI 43-101 compliant technical report for Chidliak that included an update to the CH-6 resource.

In 2016, no geological field work was done as Peregrine analyzed the results of its 2015 program. Results from the CH-7 bulk sample returned an overall diamond grade of 0.88 carats per tonne (ct/t). A total of 717.65 carats of commercial-size diamonds were recovered. Significant diamond breakage was observed and the company brought in a consultant to complete a breakage analysis who concluded that the breakage ratio was abnormally high. These findings

indicate that the reported grade of 0.88 ct/t is a conservative estimate, and a higher grade may be expected in a mining scenario.

A 735.75 carat parcel from the bulk sample was sent for diamond evaluation. The company also released and updated an Inferred Mineral Resource of 11.39 million carats in 4.64 million tonnes of kimberlite at an average grade of 2.45 ct/t for CH-6 and a maiden Inferred Mineral Resource for CH-7 of 4.23 million carats in 4.99 million tonnes of kimberlite at an average grade of 0.85 ct/t.

JDS Energy & Mining Inc. used this work and the earlier work that was done for the diamond resource definition program to produce an independent Preliminary Economic Assessment (PEA) for the Chidliak Phase One Diamond Development of the CH-6 and CH-7 kimberlite pipes. The PEA indicates a life of mine (LOM) of ten years and a LOM average production rate of 1.2 million carats per year (ct/y), peaking at 1.8 million ct/y with a LOM average mining head grade of 1.67 ct/t. The estimated pre-production capital requirement is approximately \$434.9 million, including a \$56.7 million contingency and includes the construction of a 160 km, all-weather road linking the Chidliak site to Iqaluit. Diamond valuation for both CH-6 (\$149 US/carats) and CH-7 (\$114 US/carats) used in the study were based on March, 2016 pricing. Both CH-6 and CH-7 contain populations of coloured diamonds.



<div>201</div> <div>202</div> <div>203</div>	CONTWOYTO <sup>1</sup> , HOOD RIVER <sup>2</sup> , MUSKOX <sup>3</sup>
<b>Operator/Owner</b>	Crystal Exploration Inc.
<b>Commodity</b>	Diamonds
<b>NTS</b>	76E14, 76E15 <sup>1</sup> ; 76L11, 76L14 <sup>2</sup> ; 76E13, 86I01 <sup>3</sup>
<b>Land Tenure</b>	Crown, Surface IOL <sup>1,2,3</sup>
<b>Location</b>	275 km southeast of Kugluktuk <sup>1</sup> ; 200 km southeast of Kugluktuk <sup>2</sup> ; 240 km southeast of Kugluktuk <sup>3</sup>

Crystal Exploration Inc. is a Canadian junior company exploring for diamonds in the Kitikmeot Region. The company currently holds 1,150 square kilometres in eight prospecting permits covering the Hood, Muskox and Contwoyto project areas. Crystal acquired these properties located along the proposed Grays Bay road in a deal finalized in November 2015.

In late 2015, the company acquired, logged and sampled historical, previously un-sampled and unreported drill core from five holes from the Muskox kimberlite pipe. Three large samples ranging in weight between 2,083 and 2,200 kilograms were submitted for diamond processing. These samples represented 303-318 m of drill core and contained up to 88 per cent kimberlite. Diamonds, described as “off-white, transparent with no to minor inclusions”, were recovered from all samples and graded from 0.29 to 1.13 ct/t.

The 2016 program consisted of a high resolution magnetic survey, till sampling, prospecting and mapping. Two rock samples and 146 till samples were collected and submitted for analyses. The magnetic surveys followed up on field work undertaken to confirm and prioritize 72 prospective targets. These surveys were conducted on 17 grids for a total of 83 line-km and resulted in delineating five high-priority, “bullseye” drill targets, ranging from 123 to 225 m in size. Four of these targets are magnetic highs and one is a magnetic low.

Following the exploration program, the company announced an addition of a 150 ha mineral claim adjacent to the Muskox Project and possibly containing a sixth high-priority target. A NI 43-101 Technical Report and the analytical results from 2016 program were planned to be released late in 2016.

<div>204</div>	KAHUNA
<b>Operator/Owner</b>	Dunnedin Ventures Inc.
<b>Commodity</b>	Diamonds
<b>NTS</b>	55J14, 55O02, 55O03
<b>Land Tenure</b>	Crown, Surface IOL
<b>Location</b>	35 km west of Chesterfield Inlet

The 60,000 ha Kahuna diamond property was first identified as prospective for kimberlites under a joint venture between Shear Minerals Ltd. and Stornoway Diamond Corporation in 2001. Historical work at this property includes bulk sampling, drilling, and geophysical surveys on three diamondiferous kimberlite dykes – Kahuna, PST and Notch.

Kimberlite at Kahuna occurs as pipes and dykes and can be divided into two types: Type A and Type B. Type A kimberlites were emplaced between 170 and 226 million years ago (Ma). They are characterized by strong magnetic signatures, fine grained magmatic textures, low abundances of indicator minerals and a geochemical signature indicative of low diamond potential. The Type B kimberlites were emplaced between 233 and 239 Ma. They are magmatic, medium to coarse-grained, contain abundant indicator minerals and have a geochemical signature that is indicative of higher diamond potential. The diamondiferous dykes Kahuna, PST and Notch are all type B Kimberlites.

In 2014, Dunnedin Ventures Inc. signed a four-year option agreement with private vendors on the Kahuna property. Dunnedin must spend a total of \$5 million, to earn a 100 per cent interest in the project.

In 2015, the company mapped the Kahuna, Notch, and PST kimberlites, collected 180 till samples and 4 tonnes of bulk sample material from various locations and identified future bulk sample locations. Results from the 0.82-tonne sample from the PST kimberlite were released and this mini-bulk sample returned 96 commercial-sized stones (+0.85 mm) totalling 5.34 carats for a sample grade of 6.50 ct/t. The diamonds were mostly white to off-white, with a small coloured component. The largest diamonds recovered from the sample were a 2.22-carat polycrystalline diamond and a 0.77-carat octahedral diamond

In 2016, the company released results of the 2015 Notch kimberlite sample. This mini-bulk sample was processed in two batches, a 1.02 tonne sample which returned 36 commercial-sized stones (+0.85 mm) totalling 0.66 carats, for a sample grade of 0.99 ct/t and a 1.30 tonne sample which returned 49 commercial-sized stones (+0.85 mm) totalling 1.29 carats, for a sample grade of 0.99 ct/t. All the diamonds are clear and colourless variants of octahedra with the largest diamond being a 0.23 carat clear and colourless octahedral stone. Dunnedin also collected 1,111 till samples to refine and expand existing indicator mineral trains and to test for the presence of indicator mineral trains down-ice of kimberlite bodies identified from geophysical anomalies. An additional 25,000 ha of mineral tenure was also staked.

While Dunnedin remains focused on its diamond assets at Kahuna, there is also historic gold mineralization known on the property. These occurrences, coupled with the project's proximity and similar geology to Agnico Eagle Mines Ltd's Meliadine project, have the company evaluating the gold potential of the Kahuna property. The company submitted 129 of its 2015 heavy mineral concentrates for analyses, 84 of which returned greater than 50 ppb (parts per billion) gold. These values are considered anomalous, and include 12 samples which returned greater than 1,000 ppb gold and a high of 5,930 ppb gold. Examination of the gold grains in the concentrates identified them as coarse grains with fragile textures suggesting a local bedrock source. Dunnedin has also identified 97 mineralized grab samples from the historic data that returned values between 0.05 and

2.52 grams per tonne gold (g/t Au), as well as an intersection from historic drill core with visible gold that returned a value of 7.24 g/t Au over 0.68 m. The company plans to transfer its gold and copper assets, including the rights to the gold mineralization at Kahuna, to a new subsidiary.

205	MEL
<b>Operator/Owner</b>	North Arrow Minerals Inc.
<b>Commodity</b>	Diamonds
<b>NTS</b>	46007 – 46010
<b>Land Tenure</b>	Crown, Surface IOL
<b>Location</b>	135 km south of Hall Beach

North Arrow Minerals Inc. acquired the Mel property in August 2013. Five prospecting permits comprise the project area and cover approximately 73,865 hectares of Crown land and surface IOL. The property is 100 per cent owned by North Arrow and is subject to a 1 per cent gross royalty on production payable to Anglo Celtic Exploration Ltd.

The main targets at Mel are two kimberlite indicator mineral (KIM) trains with undefined sources. These trains include indicator minerals of eclogitic garnet and pyrope garnet, commonly indicative of diamonds in a kimberlite. An airborne magnetic survey was completed in 2013, till sampling and prospecting was undertaken in 2014 and North Arrow collected 227 till samples in 2015 for geochemistry and to delineate the two KIM trains.

In early 2016, results from 175 of the 2015 till samples were released. Numerous highly anomalous samples were identified, with four samples returning more than 100 KIM grains. Microprobe analyses have confirmed these grains as mantle-derived pyrope and eclogitic garnets and magnesium ilmenite kimberlite indicator minerals. This distribution suggests that the northernmost KIM train is made up of at least two, and possibly as many as four, discrete trains. An additional 111 till samples were collected in an area extending up to 2 km up-ice from the anomalous 2015 samples to define the up-ice extension of these KIM trains, but no results have been released. North Arrow has indicated that it intends to apply for the required permits to allow for exploration drilling of targets on this property.



Till samples and helicopter from the 2015 Mel project exploration program – *Courtesy of North Arrow Minerals Inc.*



## GOLD

<b>300</b>	<b>AMARUQ</b>
<b>Operator/Owner</b>	Agnico Eagle Mines Limited
<b>Commodity</b>	Gold
<b>NTS</b>	66H01 – 66H03, 66H06 – 66H09
<b>Land Tenure</b>	Crown, Subsurface IOL
<b>Location</b>	120 km north of Baker Lake

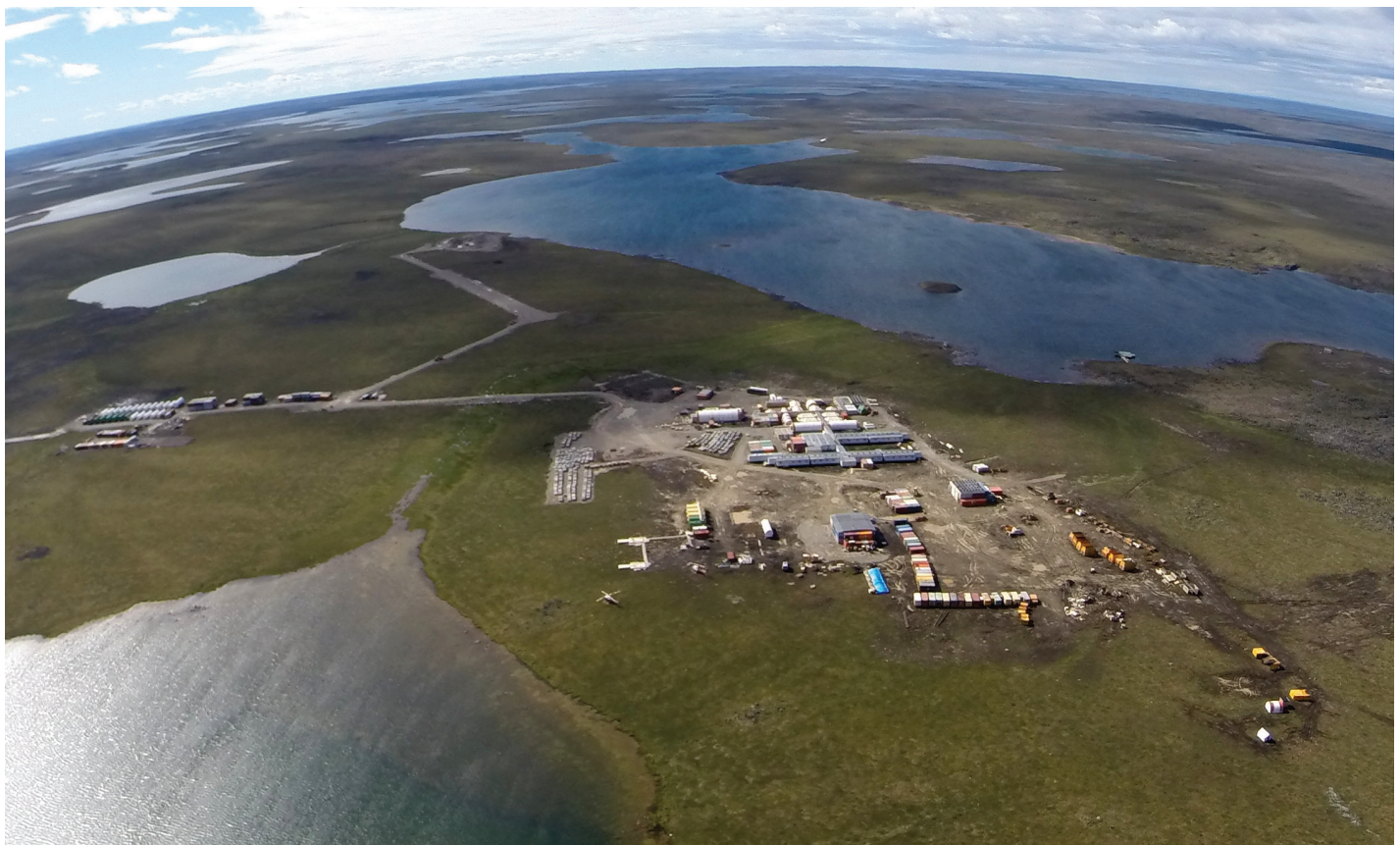
Amaruq is the flagship exploration project for Agnico Eagle Mines Ltd. in Nunavut. The property, acquired in 2013, covers 116,717 hectares including an IOL Exploration Agreement and Crown mineral tenure. Amaruq is located 50 km northwest of Agnico Eagle's Meadowbank gold mine, and is viewed as a potential source of mill feed when production ceases from the Meadowbank deposits.

Multiple east-west striking mineralized zones are known at Amaruq. The bulk of the drilling has been focused on the Whale Tail deposit, which is comprised of five mineralized

lenses. Other zones on the property include the I, V and R zones, and the Mammoth 1 and 2 zones. Drilling in 2015 confirmed that the Whale Tail deposit and Mammoth 1 zone form a single, continuous, 2.3 km long mineralization system that extends from surface to a depth of 650 m.

The first phase of the \$33 million 2016 exploration program included 77,517 m of diamond drilling completed in 338 holes from the end of January to the end of June, mainly on lake ice. Almost half of this drilling was completed at the IVR zones, with 30 per cent at Whale Tail and the rest at Mammoth. The second phase of the 2016 exploration program consisted of approximately 50,000 m of diamond drilling completed from June to October on land. Further work in 2016 involved the acquisition of the necessary regulatory permits, and ongoing engineering and environmental baseline studies for the project.

The results of the first phase of drilling contributed to an increased inferred resource for Amaruq of 19.4 million tonnes grading 5.97 grams of gold per tonne (g/t Au) for 3.71 million ounces of gold. Approximately 77 per cent of this resource is in the Whale Tail deposit. The company anticipates that an updated mineral resource estimate incorporating the balance



Amaruq Exploration Camp – Courtesy of Agnico Eagle Mines Limited

of the 2016 drill results will be released in February 2017. The update is expected to include an initial estimate of indicated mineral resources for the Amaruq project.

New discoveries in 2016 included an additional vein structure in the V zones, with highlights of up to 15.5 g/t Au over 9.4 m in drill hole AMQ16-706. The V zones are being evaluated as a potential second source of open pit ore at Amaruq. The deepest mineralization intersected at the Whale Tail deposit to date is 5.4 g/t Au over 3.3 m at 658 m depth and 5.5 g/t Au over 16.1 m at a depth of 725 m (hole AMQ16-1045), including 13.1 g/t Au over 3.5 m.

In March 2016, the company received the Type B water licence from the Nunavut Water Board to allow the construction of the 62 km all-weather access road linking Amaruq to Meadowbank. The road will facilitate logistical support to the site and as of October 2016, 15.7 km of road has been completed.

The Nunavut Impact Review Board (NIRB) recommended the proposed Whale Tail project go through a full environmental assessment and at the end of June 2016, Agnico Eagle submitted an Environmental Impact Statement to NIRB.

If all is approved, the company anticipates a potential start-up of mining operations at the Whale Tail pit in approximately two years. The acquisition of approval permits is ongoing to allow for the development of an exploration ramp and the potential collection of a bulk sample.

<b>301 302</b>	<b>BACK RIVER (GEORGE LAKE<sup>1</sup>, GOOSE LAKE<sup>2</sup>)</b>
<b>Operator/Owner</b>	Sabina Gold & Silver Corp.
<b>Commodity</b>	Gold
<b>NTS</b>	76G13, 76G14, 76J03, 76J04 <sup>1</sup> ; 76G09 – 76G11, 76G14 – 76G16 <sup>2</sup>
<b>Land Tenure</b>	Surface IOL, Subsurface IOL <sup>1</sup> ; Crown, Subsurface IOL <sup>2</sup>
<b>Location</b>	365 km south of Cambridge Bay <sup>1</sup> ; 390 km south of Cambridge Bay <sup>2</sup>

Sabina Gold & Silver Corp.'s Back River project is located in the northeastern part of the Slave Structural Province and made up of six properties: George, Boulder, Boot, Goose,

Del, and Bath. This exploration project encompasses about 80 km of banded iron formation (BIF) and gold mineralization is found both within and outside the BIF units. Measured and indicated resources for Back River are 5.33 million ounces of gold with an inferred resource of 1.85 million ounces of gold. Current proven and probable mineral reserves are estimated at 2.50 million ounces of gold grading at 6.3 grams per tonne gold (g/t Au). These mineral reserve estimates are calculated for the Umwelt, Llama, and Goose Main deposits, all of which are located on the Goose property.

The Goose property is underlain by a folded sequence of turbiditic meta-sediments with minor amounts of oxide and silicate-facies BIF units of the Beechey Lake Group. This folded sequence is cut by late-stage faulting and intruded by felsic to gabbroic dykes. The significant Goose property deposits Umwelt, Llama, and Goose Main are all hosted within locally sulphidized BIF with interbeds of greywacke, siltstone, and mudstone. Gold mineralization is associated with quartz veining, silicification, and shearing within the iron formation units and can be found within the sedimentary interbeds. The associated mineralization consists of pyrite, arsenopyrite, and pyrrhotite with lesser amounts of chlorite, hornblende, carbonate, and grunerite.

In 2016, Sabina Gold & Silver Corp. completed a limited spring exploration program focused on drill testing three targets within the Goose property. The program consisted of 16 short diamond drill holes on the Convergence, Hivogani and Kogoyok showings. Drilling outlined a new discovery in the vicinity of the Convergence prospect with an intercept of 3.84 g/t Au over 3.7 m and 1.80 g/t Au over 1.85 m. Visible gold was observed in drill core from both Convergence and Kogoyok showings.

The Hivogani mineralized trend is located approximately 1.5 km southwest of the Goose Main deposit and hosts mineralization outside of the BIF units. Gold is found in quartz veining in altered sedimentary and felsic intrusive rocks. One of the two drill holes into this target intersected gold mineralization of 2.68 g/t Au over 1 m.

The Kogoyok prospect is hosted within a metasedimentary sequence consisting of a 5 m-thick oxide iron formation overlain by a thinner mudstone and a 10-15 m-thick oxide and silicate BIF with minor clastic interbeds. Arsenopyrite is the dominant sulphide and can comprise up to 20 per cent of the host rock of some samples. Lesser amounts of pyrite and pyrrhotite are also present. These sulphides occur in both iron



formations, as well as in bounding clastic metasediments. Two felsic dykes and one gabbroic dyke cross-cut the sequence. Gold mineralization is spatially associated with arsenopyrite and occurs within the BIF and the felsic dyke. Highlights of the 2016 drilling at Kogoyok include 2.62 g/t Au over 2.3 m and 2.37 g/t Au over 1.9 m.

In June 2016, the Nunavut Impact Review Board issued its determination to the Minister of Indigenous and Northern Affairs recommending that Sabina's Back River project not proceed to the licensing and permitting regulatory phase at this time. At time of writing, the Minister's response is pending.

<b>303</b>	CO-20
<b>Operator/Owner</b>	Transition Metals Corp., Nunavut Resources Corp.
<b>Commodity</b>	Gold, Copper, Zinc
<b>NTS</b>	76L10, 76L15
<b>Land Tenure</b>	Subsurface IOL
<b>Location</b>	215 km southeast of Kugluktuk

CO-20 is one of the properties of the 'Nunavut Alliance' which is a five-year partnership signed in 2012 between Transition Metals Corporation and Nunavut Resources Corporation. This partnership was formed to generate projects and conduct mineral exploration in the Kitikmeot region of Nunavut and in the northern part of Northwest Territories. In 2014, the 100 per cent Inuit owned Nunavut Resources Corporation formed a subsidiary company called West Kitikmeot Gold Corp (65 per cent Inuit owned) and subsequently transferred its portion of the 'Nunavut Alliance' partnership to this subsidiary.

This property consists of two blocks within IOL parcel CO-20 and was acquired in 2014 via a mineral exploration agreement (MEA WestKit-0001 with Nunavut Tunngavik Inc.). The CO-20 property is located mid-way along the proposed Grays Bay Road (see Izok Corridor project, p.49) in the western Kitikmeot region. CO-20 is made up of two properties, with the North property encompassing 21,154 hectares and located in the northern portion of the IOL parcel CO-20 and adjacent to the southern edge of the Ulu gold deposit. Previous drilling on the North property outlined numerous exploration targets along a shear zone with intercepts of up to 29.4 grams per tonne gold (g/t Au) over 4.5 m and analyzed

grab samples returned assays up to 92.3 g/t Au. The property also contains a volcanogenic copper-zinc showing.

The 5,186 ha South property is located at the south end of IOL parcel CO-20 and contains several showings over a 3 km west-northwest trending area with the best results being a 19.2 g/t Au value grab sample taken from felsenmeer and a 19.0 g/t Au value from a chip sample.

In 2015 the company compiled historical exploration and drill-hole data. A 275 line-kilometre helicopter-borne electromagnetic survey was also completed, covering a 25 square kilometres area along the North property shear zone. This survey identified several high-priority gold exploration targets with similar anomalous responses to several targets proven by historical drilling. Volcanogenic massive sulphide-type (VMS) targets were also identified near the No Lake showing, west of the shear zone, where historical sampling assayed at up to 2.19% Cu. No field work was reported for 2016.

<b>304 305 306 307 308</b>	COMMITTEE BAY (ANURI-RAVEN <sup>1</sup> , FOUR HILLS-COP <sup>2</sup> , INUK <sup>3</sup> , THREE BLUFFS <sup>4</sup> , WEST PLAINS <sup>5</sup> )
<b>Operator/Owner</b>	Auryn Resources Inc.
<b>Commodity</b>	Gold
<b>NTS</b>	56J12, 56K05 – 56K12 <sup>1</sup> ; 56K05 – 56K07, 56K10 – 56K12 <sup>2</sup> ; 56P01, 56P0 <sup>3</sup> – 56P073; 56J10 – 56J11, 56J13 – 56J16 <sup>4</sup> ; 56K02 – 56K04, 56K06, 56F13 <sup>5</sup>
<b>Land Tenure</b>	Crown, Surface IOL <sup>1,3,4,5</sup> ; Crown <sup>2</sup>
<b>Location</b>	245 km southwest of Kugaaruk <sup>1</sup> ; 260 km southwest of Kugaaruk <sup>2</sup> ; 130 km south of Kugaaruk <sup>3</sup> ; 215 km southwest of Kugaaruk <sup>4</sup> ; 300 km southwest of Kugaaruk <sup>5</sup>

In the eastern Kitikmeot region, Auryn Resources Inc. undertook an extensive staking and exploration program on its Committee Bay gold project in 2016. The project covers the Archean Committee Bay greenstone belt, a northeast-southwest trending belt that is over 300 km long with widths ranging from 5 to 50 km. This greenstone belt is located approximately 180 km northeast of Agnico Eagle's Meadowbank mine and is one of numerous Archean greenstone belts with known gold occurrences in the Rae

Domain of the Western Churchill province. The Committee Bay belt has been explored and mapped by numerous companies and other geoscientists since it was initially mapped by the Geological Survey of Canada in the 1960s.

A NI 43-101 compliant mineral resource has been defined at the Three Bluffs deposit and currently stands at 683,000 ounces of gold at an average grade of 4.91 grams per tonne gold (g/t Au) in the Indicated category and 965,000 ounces of gold grading 5.43 g/t Au in the Inferred category. Gold mineralization in this deposit is structurally controlled and hosted in gossanous, folded banded iron formation and in greywacke. The folded iron formation units range in thickness from 10 to 55 m and have a strike length of 1.8 km.

In spring 2016, the company staked an additional 160,000 ha increasing the total area in the land package to more than 380,000 ha. In addition to staking, Auryn completed 6,000 line km of high-resolution, airborne electromagnetic and magnetic geophysical surveys. The survey was flown over target areas in the Three Bluffs-Anuri corridor, with an additional 800 line km of ground magnetic survey conducted in the vicinity of the Three Bluffs deposit.

During the summer of 2016, Auryn conducted an eight week long exploration program consisting of rotary air blast (RAB) and diamond drilling, till sampling, drone imagery acquisition and boulder train mapping. Over 5,000 regional till samples and 3,100 XRF till samples were collected and over 1,000 line km of boulder train mapping was completed. Drone imagery covering over 85 per cent of the property (in excess of 3,500 km<sup>2</sup>) was also acquired. RAB drilling totalling 10,000 m tested new target structures and till anomalies below the till cover for the source rocks of boulder trains mapped during the 2015 and 2016 programs. Significant RAB drill results included an intercept of 13.7 m grading 1.91 g/t Au at Anuri prospect, 3.05 m grading 2.02 g/t Au at Muskox and 4.6 m grading 1.86 g/t Au at the West Plain prospect. Boulder sampling from two newly defined high-grade boulder trains at Anuri and Ridge prospects included assays of up to 45.9 g/t Au at Anuri and 11.0 g/t Au at Ridge.

The main goal of the 3,750 m diamond drill program conducted by Auryn in 2016 was to extend known mineralization at the Three Bluffs deposit. The program succeeded in extending gold mineralization by 200 to 250 m in the western half of the deposit, to vertical depths of 450 m, and by 100 to 250 m in the eastern portion of the deposit to

depths of 750 m vertically. Highlights of the diamond drilling at the Three Bluffs deposit include 23 m grading 2.5 g/t Au and 30 m grading 2.12 g/t Au. Additional drilling at the Antler prospect returned values of up to 3.43 g/t Au over 9 m.

In anticipation of a busy 2017 exploration program that is proposed to involve 25,000 m of drilling, Auryn ordered and shipped sufficient fuel to support the 2017 summer exploration program. This upcoming program will focus on 17 new significant targets identified during 2016.

<b>309</b>	ELU BELT
<b>Operator/Owner</b>	TMAC Resources Inc.
<b>Commodity</b>	Gold
<b>NTS</b>	76O16, 76P13, 77A02, 77A07, 77A10
<b>Land Tenure</b>	Crown, Surface IOL
<b>Location</b>	115 km southwest of Cambridge Bay

TMAC acquired mineral claims covering approximately 305 square kilometres of the Elu greenstone belt as part of the 2013 acquisition of the Hope Bay project (see below) from Newmont Mining. The Elu belt is located approximately 30 km north east of the Hope Bay greenstone belt, is of similar age and also composed of bimodal volcanic rocks intercalated with minor sediments. There is a possible link between the two belts of rocks at the southern tip of the Elu belt where the rocks trend westward forming a concave structure in which the supracrustal rocks are shared by both belts of rocks. The Elu belt is cut by a major, north-south trending shear zone marked by strong iron-carbonate alteration. Limited historical exploration work conducted on the belt demonstrate similarities between the two belts of rocks and indicates that there is significant potential for gold and VMS style base metal mineralization within the Elu belt.

During the 2015 exploration season, TMAC commissioned two airborne geophysical surveys covering the entire Elu project area. The gravity survey was completed successfully but the electromagnetic survey was suspended due to deteriorating weather conditions after completing approximately 53 per cent of the survey. In 2016, TMAC completed the survey over the remaining 47 per cent of the belt. No additional exploration was reported by the company in 2016.





Helicopter at Elu Belt – Courtesy of TMAC Resources Inc.

<b>310 / 311 / 312</b>	FOX <sup>1</sup> , PARKER <sup>2</sup> , PETER <sup>3</sup>
<b>Operator/Owner</b>	Agnico Eagle Mines Limited
<b>Commodity</b>	Gold
<b>NTS</b>	55N03, 55N04, 55N06, 55N07 <sup>1</sup> ; 55M08 – 55M10, 55N05, 55N12 <sup>2</sup> ; 55N02 – 55N04 <sup>3</sup>
<b>Land Tenure</b>	Crown, Surface IOL <sup>1</sup> ; Crown <sup>2</sup> ; Surface IOL <sup>3</sup>
<b>Location</b>	80 km northwest of Rankin Inlet <sup>1</sup> ; 140 km northwest of Rankin Inlet <sup>2</sup> ; 65 km northwest of Rankin Inlet <sup>3</sup>

The Parker Lake, Peter Lake and Fox Lake exploration properties owned by Agnico Eagle are 38,500 ha, 31,000 ha, and 29,300 ha in size respectively. The properties are on Crown land and IOL between 40 km and 140 km northwest of Rankin Inlet and between 100 km and 220 km southeast of Baker Lake. These properties cover the west-northwest extension of the regional fault structure at Meliadine and appear to be geologically similar to the Meadowbank, Meliadine and Amaruq properties.

These three gold exploration projects received the necessary authorizations for diamond drilling, prospecting and geophysical surveys in 2016. Agnico Eagle has indicated its intent to use a winter road to access those projects

from Meliadine and from Baker Lake. A drill program was planned for 2016 to investigate some potential targets identified in 2015. The three projects follow the prospective regional structure and the gold mineralized iron formation which is easily detectable with regional magnetic surveys. The iron formation is characterized as being magnetite and quartz-bearing with samples from historic drill core, trenching and grab samples returning values of up to 50 grams per tonne gold. No results from this recent work have been reported.

<b>313</b>	GREYHOUND
<b>Operator/Partner</b>	Agnico Eagle Mines Limited, Aura Silver Resources Inc.
<b>Commodity</b>	Gold, Silver, Zinc, Copper, Lead
<b>NTS</b>	56D12, 56D13, 66A09, 66A10
<b>Land Tenure</b>	Crown, Surface IOL
<b>Location</b>	40 km north of Baker Lake

The Greyhound precious and base metals project consists of 15 claims covering an area of 15,677 hectares, which were converted into mining leases this year. The property is located 40 km north of the community of Baker Lake and 35 km south of the producing Meadowbank gold mine, along the all-season road connecting Baker Lake and the mine. This road access helps to reduce the expense of exploration at Greyhound.

The prospect is characterized by a north-striking quartz vein system at the margin of a felsic sub-volcanic intrusion and mafic meta-volcanic rocks in an Archean greenstone belt. Prospects on the property include high-grade silver and anomalous gold and silver occurrences that were discovered in 2011. The claims contain Aura Lake and the Dingo gold-copper prospect which lies to the northeast of Aura Lake has a large gossanous zone with associated mineralization.

An option agreement signed between Aura Silver and Agnico Eagle Mines Limited in June 2014 allows Agnico Eagle the opportunity to earn a 51 per cent interest in the Greyhound claims over three years by doing \$1.75 million in work expenditures. Additionally, Agnico Eagle is to be the operator of the property during the agreement, needs to make \$250,000 in cash payments to Aura Silver, and has an option to increase the ownership interest to 70 per cent during another three-year period with an additional \$5 million in work expenditures. Since exercising the option, Agnico has completed drill programs in 2014 and 2015 and soil sampling.

A snowmobile-mounted magnetic geophysical survey completed in May 2016 identified a large magnetic feature measuring 2 km by 3 km that overlies the area in which assay values returned up to 30 grams per tonne gold (g/t Au) from frost heave and boulder samples. The company believes that this magnetic zone, 300 m deep, could reflect massive sulphide mineralization and be the source of high-grade gold, silver and base metals found on the property. A third phase of drilling is planned for early spring 2017 to follow up on some new prospecting and geophysical targets.



Massive sulphides at Greyhound – Courtesy of INAC

In 2016, a mapping and prospecting program covered 488 outcrops. A quartz vein containing copper and lead mineralization at Gilmore prospect in the east of the property returned multiple gold mineralized assays up to 15.60 g/t Au.

<b>314 315 316 317</b>	GRUMPY <sup>1</sup> , HAPPY THOUGHT <sup>2</sup> , PARK PLACE GOLD <sup>3</sup> , UIST <sup>4</sup>
<b>Operator/Owner</b>	Silver Range Resources Ltd.
<b>Commodity</b>	Gold
<b>NTS</b>	76M10 <sup>1</sup> ; 76K14, 76N02 <sup>2</sup> ; 76C14, 76C15, 76C16, 76F02 <sup>3</sup> ; 76F01, 76G04 <sup>4</sup>
<b>Land Tenure</b>	Crown <sup>1,2,4</sup> , Subsurface IOL <sup>3</sup>
<b>Location</b>	180 km southeast of Kugluktuk <sup>1</sup> ; 260 km southeast of Kugluktuk <sup>2</sup> ; 415 km southeast of Kugluktuk <sup>3</sup> ; 415 km southeast of Kugluktuk <sup>4</sup>

Silver Range Resources Inc. is a new entry in 2016 to Nunavut mineral exploration and has assembled a portfolio of six gold exploration properties in the Kitikmeot and Kivalliq regions. Four of these properties, Grumpy, Happy Thought, Park Place Gold and Uist, are located in the vicinity of the proposed Grays Bay road.

The Grumpy property covers an area with historical auriferous quartz vein systems located in the northern portion of the Archean High Lake greenstone belt. A number of historical trenches cutting across one of the showings on the property returned values of up to 20 grams per tonne gold (g/t Au) over 1 metre (m) and 10.8 g/t Au over 1.9 m. No work was reported in 2016 by the company on this property.

Gold mineralization at Happy Thought, Uist and Park Place Gold is hosted in altered, sulphidized iron formations. Sampling conducted during staking returned values of up to 3.10 g/t Au at Happy Thought and 64.3 g/t Au at Uist. The Park Place Gold property has showings with iron formation hosted gold mineralization. No sampling was done by the company on this property but historical sampling has returned assay values up to 61 g/t Au and drill intercepts of 11.7 g/t Au over 3 m and 4 m assaying 4.8 g/t Au.



<b>318</b>	HARD CASH
<b>Operator/Owner</b>	Silver Range Resources Ltd.
<b>Commodity</b>	Gold
<b>NTS</b>	65C13, 65C14
<b>Land Tenure</b>	Crown
<b>Location</b>	390 km west of Arviat


Silver Range's Hard Cash project is located in the Ennadai greenstone belt in the Kivalliq region. This property has historical showings of gold mineralization associated with a large scale shear zone and hosted in typical Archean lode-gold settings, in iron formation units and in graphitic schists. The property was previously explored in the 1990s by Phelps

Dodge who conducted an Induced Polarization survey that identified anomalies that have not been drill-tested. Sampling by Panarc Resources, which owned the property prior to Silver Range, in 2012 focused on the Archean lode-style Swamp showing and returned values of up to 174 grams per tonne gold (g/t Au) and 1,193 grams per tonne silver (g/t Ag) with approximately 30 per cent of the samples collected assaying at values greater than 10 g/t Au and/or 100 g/t Ag. Quartz veins are hosted within a 100 metre wide shear zone within mafic volcanic rocks and associated with intense sericitization. At this showing, Gold mineralization is hosted in laminated quartz veins with pyrite, chalcopyrite, galena and minor silver mineralization. New work by Silver Range in 2016 at the Swamp showing consisted of prospecting, sampling and boulder train mapping. This work resulted in the strike-length of the showing being extended to 1,400 m. Float samples from the mineralized zone assayed up to 116 g/t Au with bedrock samples assaying up to 11.45 g/t Au.



Unloading of the mill at Hope Bay – Courtesy of TMAC Resources Inc.



<b>319 320</b> <b>321</b> 	<b>HOPE BAY (BOSTON<sup>1</sup>, DORIS NORTH MINE<sup>2</sup>, MADRID<sup>3</sup>)</b>
<b>Operator/Owner</b>	TMAC Resources Inc.
<b>Commodity</b>	Gold
<b>NTS</b>	76008 – 76010 <sup>1</sup> ; 77A03 <sup>2</sup> ; 76015, 76016, 77A03 <sup>3</sup>
<b>Land Tenure</b>	Crown, Surface IOL, Subsurface IOL <sup>1,2,3</sup>
<b>Location</b>	165 km southwest of Cambridge Bay <sup>1</sup> ; 125 km southwest of Cambridge Bay <sup>2</sup> ; 130 km southwest of Cambridge Bay <sup>3</sup>

TMAC's Hope Bay project, with its flagship Doris deposit, is located in the Kitikmeot region, and is on schedule to commence production in early 2017. The property covers an area of 1,100 square kilometres and includes the Madrid mineralized trend as well as the Doris and Boston deposits. Together, these deposits have measured and indicated mineral resources in excess of 4.5 million ounces of gold with an average grade of 9.2 grams per tonne gold (g/t Au) and inferred resources of more than 1.4 million ounces with an average grade of 7.4 g/t Au. The Doris deposit, which saw the bulk of development and exploration work in 2016, is the northernmost of the three deposits.

The Doris deposit was discovered in 1995 by BHP Billiton, with subsequent exploration and development activities undertaken by Miramar Hope Bay Ltd. and Newmont Mining Corporation. TMAC acquired the project from Newmont in March 2013 and has worked steadily to progress the properties toward production. Doris is a typical Archean lode deposit with a steeply-dipping, 3 km long quartz vein system hosted in metamorphosed and deformed pillowed basalts. Gold mineralization is present in the form of disseminated and visible gold commonly associated with pyrite mineralization and with thin tourmaline chlorite septa in veins. In addition to pyrite, trace amounts of chalcopyrite, sphalerite and pyrrhotite are observed. The current mineral resources at the Doris deposits amount to 870,000 ounces of gold in the measured and indicated resource categories and 247,000 ounces of gold in the inferred category. The resource has only been defined in the rocks and veins above the diabase dyke cutting the deposit.

TMAC drilled 67 diamond drill holes totalling 19,402 metres (m) at Doris in 2016. The primary objective of this drilling campaign was to build on the existing mineral resource



Visible gold in quartz from Doris North Level 4966 East Limb North – *Courtesy of TMAC Resources Inc.*

estimates and to further the understanding of the geology and mineralization of the “Below the Dyke” (BTD) zone. This zone was drilled from an underground platform and completed in the first quarter of the year. Drilling successfully intercepted gold mineralization below the diabase dyke and proved the presence of high-grade gold mineralization outside of the current resource. Some highlights from the BTD zone drilling include 13.2 m grading at 26.7 g/t Au, 5.1 m grading 50 g/t Au and 4.3 m of 68.9 g/t Au. Positive drilling results from this zone prompted the company to plan an additional 1,200 m of ramp development to provide drilling platforms for further exploratory drilling of mineralization below the dyke.

In anticipation of the planned production start-up for Doris North in early 2017, TMAC transported and off-loaded the new processing plant and assembled it in the newly constructed building for the plant's planned commissioning in December 2016. The Hope Bay airstrip was extended to 1,500 m long and widened to 40 m to allow the use





Vault Pit mining at Meadowbank gold mine – *Courtesy of Agnico Eagle Mines Limited*

of Hercules transport and 737 jets. TMAC received an amended Doris North Project Certificate and in early November 2016, the Nunavut Water Board issued an amended Type A Water Licence to the Minister of Indigenous and Northern Affairs for review. Pending the Minister's approval and along with the amended project certificate, these authorizations will allow for the extension of the Doris mine life to six years.

In addition to exploration and development activities at Doris, TMAC continued drilling at the Naartok zone located at the northernmost extent of the Madrid mineralized trend. Gold mineralization at Naartok is associated with brecciated zones with higher gold grades corresponding with zones of higher brecciation. Silicification and sericitization are the prominent alteration styles, with gold mineralization associated with pyrite. The 2016 drilling program was intended to further the geological understanding of the Madrid North deposit and to expand the Naartok mineral resource which will be updated in 2017. The current mineral resource at Naartok is 1.73 million ounces of gold at an average grade of 8.4 g/t Au in the measured and indicated categories, and an additional 242,000 ounces of gold in the inferred category.

The 2016 campaign consisted of 4,680 m of drilling in 17 holes and succeeded in defining a broad zone of lower grade mineralization which contains higher grade domains. This mineralized zone, which is outside the current resource, trends north, orthogonally to zones in current mineral resource. Highlights of drilling included 24.08 m grading at 2.92 g/t Au including 3 m of 13.27 g/t, as well as 15.29 g/t Au over 6 m further down the same hole, and 12 m grading at 10.49 g/t Au.

TMAC's southernmost deposit located in the Hope Bay belt, the Boston deposit, possesses 1,246,000 ounces of gold in resources (measured and indicated, and inferred categories), but there was no exploration or development work undertaken at Boston in 2016.

<b>322</b> 	<b>MEADOWBANK MINE</b>
<b>Operator/Owner</b>	Agnico Eagle Mines Limited
<b>Commodity</b>	Gold
<b>NTS</b>	56E04, 66A16, 66H01
<b>Land Tenure</b>	Crown, Subsurface IOL
<b>Location</b>	75 km north of Baker Lake

The Meadowbank Mine, owned by Agnico Eagle Mines Limited, began production from the Portage open pit in 2010. The mine has produced 2.3 million ounces of gold as of September 2016. Operations at the mine support a variety of businesses in Baker Lake and elsewhere in Nunavut, and the mine itself has a workforce of approximately 700 people. In 2016, the proposed Vault pit expansion received regulatory approvals to allow the mine-life to be extended into late 2018.

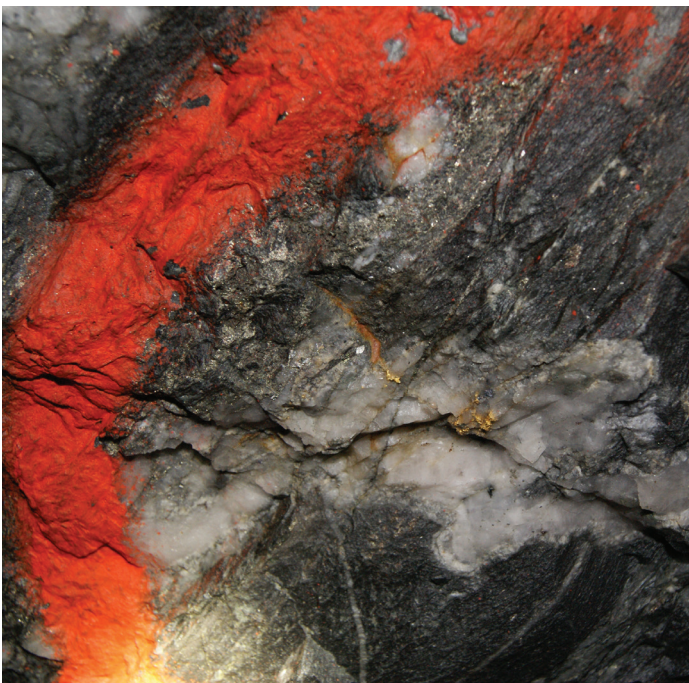
In the first nine months of 2016, the company produced 217,444 ounces of gold, as compared to 279,222 ounces for the same period in 2015, and a total production in 2015 of 381,800 ounces. Proven and probable open pit reserves at Meadowbank, including the Vault expansion, are estimated at 943,000 ounces of gold from 10.8 million tonnes grading 2.72 grams per tonne gold.

The Meadowbank property encompasses 77,774 hectares and includes the Goose Island, Portage, and Vault deposits that collectively make up the Meadowbank mine site. The deposits and mine infrastructure are all located on IOL with grandfathered Crown mining leases. The Vault deposit,

including the Vault extension also located on subsurface IOL, is covered by a Mineral Production Lease with Nunavut Tunngavik Inc.

Geologically, the Goose Island and Portage deposits are comprised of deformed and metamorphosed Archean quartzites, iron formation units, ultramafic rocks, and felsic to intermediate volcano-sedimentary rocks of the Woodburn Lake group. This group is locally tightly folded, structurally complex, and located between regional-scale granitic plutons. The host rocks and associated gold deposits are within rocks at the greenschist to amphibolite grade of metamorphism.

The Goose Island and Portage deposits are separated by 500 metres (m), and are hosted by magnetite-rich iron formation. The gold mineralization is associated with quartz veining and the replacement of magnetite by pyrite-pyrrhotite in the iron formation units. Mineralization at Goose Island extends over a strike-length of over 750 m, has a north-south trend, dips steeply to the west and splays at depths to 500 m. The Portage deposit is approximately 1.85 km long; the host rocks are highly folded along a north-northwest-trending deformation zone with both fold limbs dipping moderately to the west. In the hinge zone, the mineralized zones may be up to 20 m thick with true thicknesses ranging from 3 to 12 m elsewhere in the folds. Reserves have been depleted at the Goose Island open pit and production from the Portage pit is minimal.



Visible gold underground at Meliadine – Courtesy of INAC

The Vault deposit is 1.2 km-long and is located 3 km northeast of Portage pit. The Vault deposit is hosted by gently-dipping intermediate to felsic volcanic rocks and porphyry dykes that exhibit hydrothermal alteration over widths of several metres. Gold mineralization is controlled by an intersecting set of faults at oblique angles and most of the gold mineralization is confined to shear zones. These shear zones are discordant to geological contacts, continuous for several hundred metres, and contain additional disseminated sulfide mineralization. Sericitic and silicic alteration, typically 8 to 12 m thick, is confined to the gold-bearing ore zone. Additional mineralized lenses up to 5 metres thick are found in the hanging wall. This style of mineralization at the Vault deposit is different and distinct from the banded iron formation-hosted deposits at Goose Island and Portage deposits. In July 2016, the company was granted an amendment to its project certificate for Meadowbank which allows for the development of the Vault pit into Phaser Lake. This development will allow for the extraction of approximately 40,000 ounces of gold in 400,000 tonnes of ore.

323	MELIADINE
Operator/Owner	Agnico Eagle Mines Limited
Commodity	Gold
NTS	55J13, 55J14, 55K16, 55N01, 55N02, 55O04
Land Tenure	Crown, Subsurface IOL
Location	20 km north of Rankin Inlet

The Meliadine project, owned by Agnico Eagle Mines Limited, was acquired from Comaplex Minerals Corporation in 2010. The property consists of 111,757 hectares that are comprised primarily of Crown mineral claims and leases with an additional 4,827 ha held under an Exploration Agreement on IOL subsurface lands. The property is accessible from the community of Rankin Inlet by a 25 km all-season road constructed by Agnico Eagle in 2013.

Gold mineralization at Meliadine occurs in association with multiple quartz-carbonate-bearing shear zones and/or laminated quartz vein systems. The deposits at Meliadine are structurally controlled and hosted within the polydeformed turbiditic and sulphidized iron formation units of the Triganiaq formation. Distinct deposits have been outlined for at least 80 km in a west-northwest direction along the Pyke fault and within the regional Meliadine gold trend.



The most recent resource estimate for the Tiriganiaq and Wesmeg deposits is from December 2015, and includes combined proven and probable reserves of 3.4 million ounces of gold from 14.5 million tonnes of ore at a grade of 7.32 grams per tonne (g/t). Total open pit and underground indicated resources are estimated at 3.3 million ounces in 20.7 million tonnes grading 4.95 grams per tonne gold (g/t Au) and inferred at 3.55 million ounces in 14.7 million tonnes grading 7.51 g/t Au. Gold recovery for the existing reserves is estimated from metallurgical studies to be 96 per cent.

In February of 2015, the Nunavut Impact Review Board issued a project certificate for the Meliadine project following the successful completion of its environmental assessment. In May 2016, the company received the Type A Water License from the Nunavut Water Board, allowing Agnico Eagle to begin construction of the Meliadine mine.

Agnico Eagle budgeted \$96 million for capital and development costs at Meliadine for 2016, focusing on extending underground development by approximately 4,300 m, as well as undertaking detailed engineering studies and construction of essential surface infrastructure. The cost to construct the mill and all facilities is estimated to be \$911 million, with an expected mine life of nine years.

Internal technical studies are underway to optimize the project for a potential production start-up date of 2020.

Annual gold production of the future mine is estimated at 326,000 ounces per year for the first three years at 3,000 tonnes per day and 362,000 ounces per year in years four to nine at 5,000 tonnes per day. Underground operations are planned throughout the life of the mine, with open pit mining planned for years four to seven in two pits.

324	PISTOL BAY
Operator/Owner	Northquest Ltd.
Commodity	Gold
NTS	55K05 – 55K07, 55K12, 55L08, 55L09
Land Tenure	Crown, Surface IOL
Location	50 km northwest of Whale Cove

Northquest Ltd., now a subsidiary of Nordgold, is the 100 per cent owner of the Pistol Bay project. Pistol Bay was acquired by the company in 2010 and consists of 87 mineral claims covering 76,803 hectares in the Rankin-Ennadai greenstone belt in the Churchill Province's Hearne Domain. The property, located near Whale Cove, covers seventeen historical and newly discovered gold showings, with the Vickers deposit being the focus for the majority of recent exploration.



Helicopter and rainbow at Pistol Bay's camp – Courtesy of Northquest Ltd.

The project is located in the Kaminak Group of the larger Rankin-Ennadai belt. The group consists of volcanic and volcanoclastic rocks with intercalated iron formations, conglomerates, mudstones and siltstones, and numerous synvolcanic to late tectonic intrusions dated at approximately 2.7 billion years. These rocks have been interpreted as a series of back arcs accreted to the Rae Craton. Siliciclastic Paleoproterozoic Hurwitz Group rocks cover approximately 10 per cent of the property.

Gold mineralization at the 17 documented showings on the property is associated with hydrothermal assemblages characterized by quartz with carbonate, sericite and chlorite present in varying amounts. “Pipe-like” zones of intense silicification or “quartz-flooding” are commonly associated with gold mineralization. Pyrite is the predominant sulphide mineral associated with gold mineralization.

The Vickers deposit is located in the central part of the property. Mineralization is hosted in a sequence of quartz-sericite-carbonate schists with lesser amounts of protomylonite, and the mineralization traces the contact of a diorite intrusion. In the newly discovered Howitzer showing, mineralization is concentrated near the southern contact of the Gill South Pluton, a quartz monzonite to quartz monzodiorite body. The showing was discovered through a detailed glacial till sampling program conducted in 2015.

Since work commenced on the property in 2011 through the spring of 2016, Northquest has completed over 100 diamond drill holes at Pistol Bay, totalling 21,800 m. In April 2016 the company released a NI 43-101 compliant initial resource estimate for the Vickers deposit. The inferred resource, based on data from drilling totaling over 17,000 m from 69 drill holes, estimated the deposit to contain 739,000 ounces of gold from 7,792,000 tonnes of ore grading 2.95 grams per tonne gold. The resource is constrained to ounces falling within a Whittle pit shell. Whittle is a software program used to determine the optimal pit shell design.

In July 2016, the sale of Northquest to Nordgold was finalized with Northquest becoming a 100 per cent subsidiary of Nordgold. Following the acquisition, the company embarked on an ambitious exploration program consisting of drilling, till sampling and regional and detailed geological mapping. Till sampling followed up on highly anomalous gold counts obtained during 2015 sampling at the contacts around the Gill South Pluton. A total of 10,866 m of diamond drilling in 48 drill holes was completed.

Drilling was conducted predominantly on the Vickers deposit, where 16 holes totalling 4,003 m were drilled, and primarily to the east of the deposit to expand the inferred resource estimate. Drilling also focused on the ground south and west of the gabbro/sediment contact. Additional drilling took place at the Howitzer prospect to test anomalies delineated by the 2015 till sampling program.

No results have been released but the company is encouraged by initial results of drilling at the new Howitzer showing that indicate gold mineralization is related to zones of shearing and alteration.

325	QUARTZITE
<b>Operator/Owner</b>	Silver Range Resources Ltd.
<b>Commodity</b>	Gold
<b>NTS</b>	55L07, 55L08
<b>Land Tenure</b>	Crown
<b>Location</b>	100 km west of Whale Cove

The Quartzite project is a Silver Range property located in the Kivalliq region, and consists of three claim blocks that cover ten known structurally hosted gold showings. The area was explored in the 1990s by Noble Peak Resources that conducted airborne electromagnetic and magnetic surveys and follow-up prospecting. Targets delineated by this work have not been drill-tested.

The property consists of three blocks: West End Zone, Eva Lake Zone and Joan Lake Zone that cover a 9 km long structural contact between a gabbroic intrusion and metavolcanic rocks. Historical sampling on the West End Zone block returned values of up to 17.3 grams per tonne gold (g/t Au), with highest assays at the Eva Lake Zone showing being 132 g/t Au.


In 2016, Silver Range conducted limited exploration programs on this project and focused on confirming the historical sampling results of known showings. Grab samples from the West End, Eva Lake and Joan Lake properties returned values of up to 27.3 g/t Au, 26.2 g/t Au and 9.53 g/t Au, respectively. On all three properties gold mineralization is hosted in quartz and/or quartz-carbonate veins in altered metavolcanic rocks and was associated with pyrite +/- galena +/- chalcopyrite.





Mary River Deposit No. 1 – Courtesy of Baffinland Iron Mines Corporation

## IRON

400 	MARY RIVER MINE
<b>Operator/Owner</b>	Baffinland Iron Mines Corporation
<b>Commodity</b>	Iron
<b>NTS</b>	37C09, 37G02, 37G05 – 37G07, 37G11, 37G12, 47H08, 37C10, 37C15, 37C16, 37E13, 37F01, 37F08 – 37F10, 37F14 – 37F16, 37G01
<b>Land Tenure</b>	Crown, Surface IOL, Subsurface IOL
<b>Location</b>	155 km south of Pond Inlet

The Mary River iron mine is located on northern Baffin Island, and is 100 per cent owned by Baffinland Iron Mines, which is jointly owned by ArcelorMittal S.A. and Iron Ore Holdings LP. Iron was first discovered within the

project area in 1962. Initial exploration continued until 1965, but was discontinued and did not resume again until 2004 under the ownership of Baffinland Iron Mines. Nine deposits and several additional prospects of high-grade iron ore are known on the property. The deposits are hosted within metasedimentary and metavolcanic successions of the Archean Mary River Group, part of the Committee Bay Belt within the Rae Domain of the Churchill Province. The high-grade iron mineralization, averaging 64% Fe at Deposit No. 1, generally takes the form of hematite, magnetite and specularite iron formation.

Mining operations began at Deposit No. 1 in late 2014, and the first iron ore was shipped to European markets in August 2015. In 2016, an estimated 2.7 million tonnes of iron was shipped out of the Milne Inlet Port.

Baffinland is currently pursuing a phased development approach for the Mary River mine. Under the “Early Revenue Phase”, Baffinland is permitted to produce and transport up to 4.2 million tonnes of ore per year from Deposit No. 1 to



the Milne Inlet port via truck using the existing Tote Road, and ship the ore to market during the open-water season. Since late 2014, however, the company has been seeking a further amendment, the Phase 2 proposal, to its Project Certificate. This amendment would see the amount permitted to be shipped from the Milne Inlet port increase to 12 million tonnes per year. Originally, the company requested that the shipping season from the Milne Inlet port expand to 10 months a year, which would necessitate ice-breaking, but in response to community concerns, this has been shortened to the period from July to December. Baffinland also plans to construct a second ore dock, with capacity for up to 250,000 deadweight tonnage Cape size vessels, and a second ship loader at the Milne Inlet Port, as well as an ore crushing facility. In February 2016, Baffinland announced its intention to construct a railway between the mine site and the Milne Inlet port as part of the Phase 2 proposal. The railway would partially or completely replace transport of ore via the Tote Road.

Exploration in 2016 on the Mary River property had a budget of \$1.5 million and was carried out on claims within NTS sheets 37F and 37G. Helicopter-supported and ground prospecting traverses were carried out across selected claims, and 469 grab samples, 53 whole-rock samples and 86 channel samples were collected. No results from this sampling have been released. A ground gravity geophysical survey was also completed, and reconnaissance field investigations were undertaken in support of a planned geotechnical drill program along the proposed rail corridor.

## NICKEL-COPPER-PLATINUM GROUP ELEMENTS

500	FERGUSON LAKE
<b>Operator/Owner</b>	Canadian North Resources and Development Corp.
<b>Commodity</b>	Nickel, Copper, Platinum, Palladium
<b>NTS</b>	65I05, 65I06, 65I10, 65I11, 65I14 – 65I16
<b>Land Tenure</b>	Crown, Surface IOL
<b>Location</b>	160 km south of Baker Lake

The Ferguson Lake deposit is located within the northwestern part of the Hearne Domain of the Churchill Province, and overlies the northerly extension of the Yathkyed greenstone belt. Magmatic nickel-copper-cobalt-platinum-palladium

mineralization is hosted within fine to coarse grained hornblende-rich gabbro rocks. The main deposit is divided into three zones, East, Centre and West, all of which are spatially related to the same gabbroic unit.

This massive sulphide deposit has been explored intermittently since the 1950s by a variety of companies. The bulk of the exploration work was done by Starfield Resources Inc. between 1999 and 2011, with an updated Preliminary Economic Assessment for the deposit released in 2012. Ferguson Lake was sold to Canadian North Resources and Development in 2013. Canadian North Resources has acquired additional mineral claims and prospecting permits which bring the total area of the property to more than 130,000 hectares. A small exploration program was undertaken in 2015 but no details of the scope of that program or its results have been released. No work was completed in 2016.




Massive high grade martite (hematite) outcrop at the North Rowley River prospect – Courtesy of Baffinland Iron Mines Corporation





Angilak Property, Nutaaq Camp – Courtesy of Kivalliq Energy Corporation

## URANIUM

	ANGILAK
<b>Operator/Owner</b>	Kivalliq Energy Corporation
<b>Commodity</b>	Uranium
<b>NTS</b>	65J06, 65J07, 65J09 – 65J11, 65J15
<b>Land Tenure</b>	Crown, Subsurface IOL
<b>Location</b>	230 km southwest of Baker Lake

Kivalliq Energy has spent more than \$56 million exploring its flagship Angilak project since 2008. The property comprises one IOL subsurface parcel surrounded by 91 Crown mineral claims, for a total combined area of 89,852 hectares. The project is located near the northwestern edge of the Churchill Province's Hearne Domain between two large fault systems, the Snowbird Tectonic Zone to the northwest and the Tyrrell Shear Zone to the southeast. Angilak also overlies parts of the Angikuni and Yathkyed sedimentary sub-basins, which in turn are superimposed over Archean basement rocks.

The main exploration focus of the project is the Lac Cinquante deposit, a basement-hosted, vein-hydrothermal

type, unconformity associated uranium deposit located in the Angikuni sub-basin, and other related deposits along the Lac 50 Trend. In 2013, a NI 43-101 compliant inferred resource was released for the Lac Cinquante deposit (Main Zone, Eastern Extension, and Western Extension) and the J4 and Ray zones. Using a cut-off grade of 0.2%  $U_3O_8$ , the inferred resource is estimated to be 2.83 million tonnes of ore grading 0.693%  $U_3O_8$ , for a total of 43.3 million pounds of  $U_3O_8$ . The deposit is also estimated to contain 15.6 million pounds of copper, 10.4 million pounds of molybdenum and 1.88 million ounces of silver.

The 2016 exploration program focused on the polymetallic Yat target and the Dipole target. The Yat target area is located near the northern margin of the Angikuni sub-basin, southwest of the Lac 50 Trend deposits and northeast of Dipole. This main showing is made up of a string of sulphide-bearing radioactive subcrops in conglomerates and sandstone, and is characterized by a magnetic low with coincident high grade Au-Ag-U-Cu +/- Pt-Pd mineralization occurring within quartz-carbonate breccia and veins in hydrothermally altered rock. A linear electromagnetic conductor runs through the centre of the magnetic low at a strike of 045°. A grab sample collected from a boulder at Yat in 2015 returned the highest precious metal assays reported from Angilak, with 211 grams per tonne (g/t) gold,

80,900 g/t Ag, 1.82%  $U_3O_8$ , 6.8% Cu, 3.1 g/t Pt and 6.7 g/t Pd. As part of the 2016 program, trenching was carried out in the area of high grade polymetallic boulders and historic pits, with the objective of identifying a localized bedrock source for the boulders. Radioactive, brecciated carbonate veining with sulphides was identified in several trench areas. Channel samples included results of 2.5%  $U_3O_8$ , 16.2% Cu, 417 g/t Ag and 1.28 g/t Au from a 0.5 m sample and 0.32%  $U_3O_8$ , 0.13% Cu, 373 g/t Ag, 2.9 g/t Au and 6.4 g/t Pd from a 0.65 m sample. Samples collected from float included results of 23.6%  $U_3O_8$ , 22.7% Cu, 879 g/t Ag and 5.25 g/t Au and 3%  $U_3O_8$ , 1.28% Cu, 3,200 g/t Ag, 43.3 g/t Au, 7.8 g/t Pt and 56.3 g/t Pd.

The other component of the 2016 program was the collection of 704 soil samples for Enzyme Leach analysis. Most were collected on 50 m x 100 m spacing over the magnetic low at Yat and over part of the electromagnetic conductor. The sampling along this conductor defined a uranium-in-soil anomaly, as well as a coincident silver-in-soil anomaly.

The remainder of the soil sampling was directed at extending the 2014 soil grid at the Dipole-RIB trend. This trend is viewed as analogous to Lac 50, and drilling in 2015 intersected basement-hosted uranium mineralization with grades of up to 2.34%  $U_3O_8$  over 1.3 m. The 2016 soil samples have defined a new uranium-in-soil anomaly that overlies an electromagnetic conductor parallel to the one tested by the 2015 drilling.

The Kiggavik and St. Tropez projects are located west of Baker Lake in the eastern Thelon Basin. Uranium anomalies were first discovered in this area in 1974 by Urangesellschaft Canada Ltd., and intermittent exploration has occurred on this property since the Lone Gull deposit, now known as Kiggavik Main, was discovered in 1977. AREVA Resources Canada is the operator of the Kiggavik project, with Daewoo International Corporation and JCU Exploration (Canada) Co Ltd as joint venture partners. St. Tropez is 100 per cent owned by AREVA Resources Canada.

Kiggavik comprises 37 Crown mining leases, some grandfathered on subsurface IOL, with a total area of 18,469 hectares (ha). An additional eight mineral claims totaling 4,707 ha were staked adjacent to the eastern and southern perimeter of the mining leases in 2015. St. Tropez consists of 18 mineral claims with an area of 16,549 ha.

Five uranium deposits are known at Kiggavik: Main, Centre, East, Andrew Lake and End Grid. There are also several prospects including Bong, Granite, Jane and Sleek that have been investigated. Kiggavik Main, Centre and East deposits are located approximately 2 km south of the Thelon Fault zone at the contact between the Thelon sandstone and the basement metasedimentary rocks. The Andrew Lake and End Grid deposits, south of the Kiggavik deposits, lie along the Judge Sissons Fault zone. These two parallel fault zones are interpreted as having created a pathway for mineralizing fluids. Altered metasedimentary rocks are the main host units for uranium mineralization.

601 <sup>1</sup> 602 <sup>2</sup>	KIGGAVIK <sup>1</sup> , ST. TROPEZ <sup>2</sup>
<b>Operator/Partner</b>	AREVA Resources Canada Inc., Daewoo International Corporation, JCU Exploration (Canada) Co. Ltd. <sup>1</sup> ; AREVA Resources Canada Inc. <sup>2</sup>
<b>Commodity</b>	Uranium
<b>NTS</b>	66A05 <sup>1</sup> ; 66A05, 66A06, 66A11, 66A12 <sup>2</sup>
<b>Land Tenure</b>	Crown, Subsurface IOL <sup>1</sup> ; Crown, Surface IOL <sup>2</sup>
<b>Location</b>	80 km west of Baker Lake <sup>1</sup> ; 70 km northwest of Baker Lake <sup>2</sup>

The final public hearing for the proposed Kiggavik project was held in spring 2015, following which the Nunavut Impact Review Board (NIRB) issued its recommendation to the then-Minister of Aboriginal Affairs and Northern Development that the project not proceed to the licensing and permitting stage of the environmental assessment process. The NIRB cited a lack of detail regarding baseline data and uncertainty relating to the project start date as the reasons for its recommendation, as these factors affected the board's ability to assess the ecosystemic and socioeconomic impacts of the project.



## INACTIVE PROJECTS

NUMBER	PROJECT	REGION	OPERATOR
<b>BASE METALS</b>			
 104	ATLAS	Kivalliq	Anconia Resources Corp.
 105	Borden	Qikiqtani	MMG Resources Inc.
 106, 107	Hackett River – 106, Wishbone – 107	Kitikmeot	Glencore plc
 108, 109	Izok Corridor (High Lake – 108, Izok Lake – 109)	Kitikmeot	MMG Resources Inc.
<b>DIAMONDS</b>			
  206	Jericho Mine	Kitikmeot	INAC (abandoned by Shear Diamonds Ltd.)
 207	Luxx	Kivalliq	North Arrow Minerals Inc.
 208	Nanuq	Kivalliq	Peregrine Diamonds Ltd.
 209	Pelly Bay	Kitikmeot	Churchill Diamond Corporation
 210	Qilalugaq	Kivalliq	North Arrow Minerals Inc.
 211	Qilaq	Qikiqtani	Peregrine Diamonds Ltd.
 212	Stein	Kitikmeot	Arctic Star Exploration Corp.
<b>GOLD</b>			
 326	Hood River	Kitikmeot	WPC Resources Inc
 327	Itchen Lake	Kitikmeot	Transition Metals Corp.
 328	Kiyuk	Kivalliq	Montego Resources Inc.
  329	Lupin Mine	Kitikmeot	WPC Resources Inc.
 330	Wishbone Gold	Kitikmeot	Sabina Gold & Silver Corp.
<b>URANIUM</b>			
 603, 604	Aberdeen – 603, Turqavik – 604	Kivalliq	Cameco Corporation

Anconia Resources Corp.'s **ATLAS** base metal property, located 165 kilometres (km) northwest of Whale Cove, hosts two stratiform volcanogenic massive sulphide (VMS) exploration targets, ATLAS-1 and ZAC. Anomalously high gold and silver values are found at ATLAS-1 indicating that a secondary stage of mineralization may have occurred. The last reported exploration on the property was diamond drilling in 2013.

The **Borden** base metal property covers five prospecting permits acquired by MMG Limited in 2014 and is located 130 km southwest of Pond Inlet in the southeast part of the Borden Basin. The Borden Basin hosts the past-producing Nanisivik lead-zinc mine. No work has been reported by MMG.

Glencore plc's world-class silver-zinc VMS **Hackett River** deposit is hosted by the Hackett River greenstone belt in the western Kitikmeot region. Xstrata acquired the property, along with the adjacent Wishbone project, in 2011 from Sabina Gold & Silver Corp. Glencore became the owner of these properties following the Glencore-Xstrata merger in 2013. The Hackett River deposit includes three main bodies and a satellite deposit. Resource estimates were updated in 2013 and suggest that Hackett River is comprised of 25 million tonnes of indicated resources at average grades of 4.2% Zn, 0.6% Pb, 0.5% Cu, 130 grams per tonne silver (g/t Ag), and 0.3 grams per tonne gold (g/t Au) and 57 million tonnes of inferred resources grading 3.0% Zn, 0.5% Pb, 0.4% Cu, 100 g/t Ag, and 0.2 g/t Au. Sandstorm Gold retains a 2.0% NSR royalty that covers 7,141 hectares of the Hackett River property and includes the licenses where the mineral resources have been defined. Sandstorm acquired the royalty as part of a transaction with Teck Resources Ltd. in January 2016. Glencore plc had indicated that a Draft Environmental Impact Statement would be submitted to Nunavut Impact Review Board in December 2014 but plans for the property have been put on hold indefinitely due to market conditions and uncertainty in the global economy. Also owned by Glencore is the **Wishbone** base metal property that occupies approximately 2,000 km<sup>2</sup> of the western Hackett River greenstone belt. The last reported work on this property was in 2013.

The **Izok Corridor** project includes the High Lake and Izok Lake Zn-Cu-Pb-Ag VMS deposits located in the Slave Province. The High Lake deposit is a typical copper-zinc-lead-silver VMS deposit hosted in the High Lake greenstone belt and has an indicated mineral resource of 17.2 million tonnes grading 3.35% Zn, 2.25% Cu, 0.31% Pb, 70 g/t Ag, and 0.95 g/t Au. Both open pit and underground mine designs are being considered for the High Lake property that,

if developed, would have an estimated mine-life of 12 years. The Izok Lake property comprises five deposits containing an estimated indicated resource of 14.4 million tonnes grading 12.9% Zn, 2.5% Cu, 1.3% Pb, and 70.5 g/t Ag. The most recent exploration work was carried out in 2014, and consisted of four diamond drill holes. Due to concerns about the project's economic viability in light of needed infrastructure, MMG has asked that the environmental assessment be put on hold. In 2014, MMG submitted a proposal to the federal and territorial governments for a 325-km road that would connect the deposits to Grays Bay in Coronation Gulf. In 2016, the Government of Nunavut and the Kitikmeot Inuit Association have revised this proposal and have proposed to develop a 227 km all-season road linking the northern point of the Tibbitt-Contwoyto winter road to a deep-water port at Grays Bay.

In September 2012, Shear Diamonds Ltd. ceased operations at the **Jericho** diamond mine site. In January 2014, INAC declared the site abandoned after Shear was unable to restart the past-producing diamond mine and meet the terms and conditions of its authorizations. INAC has worked to ensure that the environmental integrity of the site is maintained and after unsuccessfully exploring private sector solutions, plans to implement a Site Stabilization Plan starting in 2017.

North Arrow Minerals Inc. acquired 100 per cent ownership of the **Luxe** diamond project in August 2013. Over the 2013 and 2014 field seasons, North Arrow investigated trains of garnet and ilmenite kimberlite indicator minerals (KIM), identified from hundreds of till sample results. The company conducted an airborne magnetic survey and identified high priority targets located up-ice of the KIM trains. No work has been reported since 2014.

Peregrine Diamonds Ltd. has owned the **Nanuq** project since 2006. Three diamondiferous kimberlite pipes were discovered in 2007 when drilling targeted geophysical anomalies associated with kimberlite indicator mineral trains. In 2014, prospecting work was conducted along two known geophysical anomalies. In March 2015, the company spun off several of its projects, including Nanuq, to its wholly-owned subsidiary Peregrine Exploration Ltd. No fieldwork was done on the property in 2015 and 2016, and the project is currently under care and maintenance.

Churchill Diamond Corporation acquired diamond data from Adamera Minerals' lapsed Amaruk diamond project in 2015, and subsequently staked 151 mineral claims over a project area referred to as **Pelly Bay**. Twenty-four of 30 kimberlites identified on the property have proved to be non-



diamondiferous. No further work has been reported. North Arrow Minerals' **Qilalugaq** diamond property near Naujaat has a NI 43-101 inferred mineral resource of 26.1 million carats in 48.8 million tonnes of kimberlite. In 2014, North Arrow spent \$3.7 million on the collection of a 1,500 tonne bulk sample from the Q1-Q4 kimberlite complex, and fulfilled the terms of its option agreement with Stornoway Diamonds to earn an 80 per cent interest in the project. The diamond recoveries from the bulk sample and valuation of the diamond parcel were reported in 2015. North Arrow is continuing to deliberate next steps for the project.

Peregrine's **Qilaq** diamond project, located east of Iqaluit on the Hall Peninsula, includes three known kimberlites: Q1, Q2, and Q3. In 2011, Peregrine evaluated KIM, gold and platinum group element anomalies on the property. Work in 2014 included a limited sampling program during which several grab and till samples were collected. No results from this work have been reported.

The **Stein** diamond property, owned by Arctic Star Exploration Corp., is located 85 km north of Taloyoak. This property consists of four contiguous prospecting permits over the same area formerly occupied by Bluestone Resources' Grail project. Arctic Star acquired the existing digital exploration database that shows discrete circular magnetic anomalies up to 200 m in diameter at the up-ice terminus of the kimberlite indicator minerals. The company announced plans to drill-test these anomalies to determine if they represented kimberlite, and further planned to collect sample material from any kimberlites to assess the diamond content. No work has been reported.

WPC Resources Inc.'s **Hood River** project in the western Kitikmeot region is located on subsurface Inuit Owned Land and covers an area of approximately 8,000 ha. The project is within the High Lake volcanic greenstone belt in the northern part of the Slave Province. Gold mineralization at Hood River is found in typical shear-hosted quartz veins. A 2014 field exploration program focused on evaluating eight documented gold occurrences and consisted of a chip and grab sampling program. No work was reported from Hood River in 2015 or 2016.

The **Kiyuk** Lake gold project is located 350 km west of Arviat. Gold mineralization occurs in a sequence of conglomerates and breccias along an unconformity between two extensive sedimentary units. The mineralizing fluids are intrusion-related and gold occurs in association with sulphide minerals and as native gold grains. The last work reported on the property was in 2013, when diamond drilling and re-logging

of core occurred. In 2016 Northern Empire Resources Corp. (formerly Prosperity Gold) sold the project to Montego Resources Inc. Kiyuk remains subject to a 2-per-cent net smelter return royalty to the original property vendor.

In November 2016, WPC Resources Inc. signed a definitive agreement to acquire the past-producing **Lupin** gold mine, and its 2,300 tonnes per day mill and processing plant, and the Ulu gold project from Mandalay Resources Corporation. The former mine is located on the western side of Contwoyto Lake, and produced approximately 3.4 million ounces of gold between 1982 and December 2004. WPC has indicated that it intends to bring Lupin back into production in the near future.

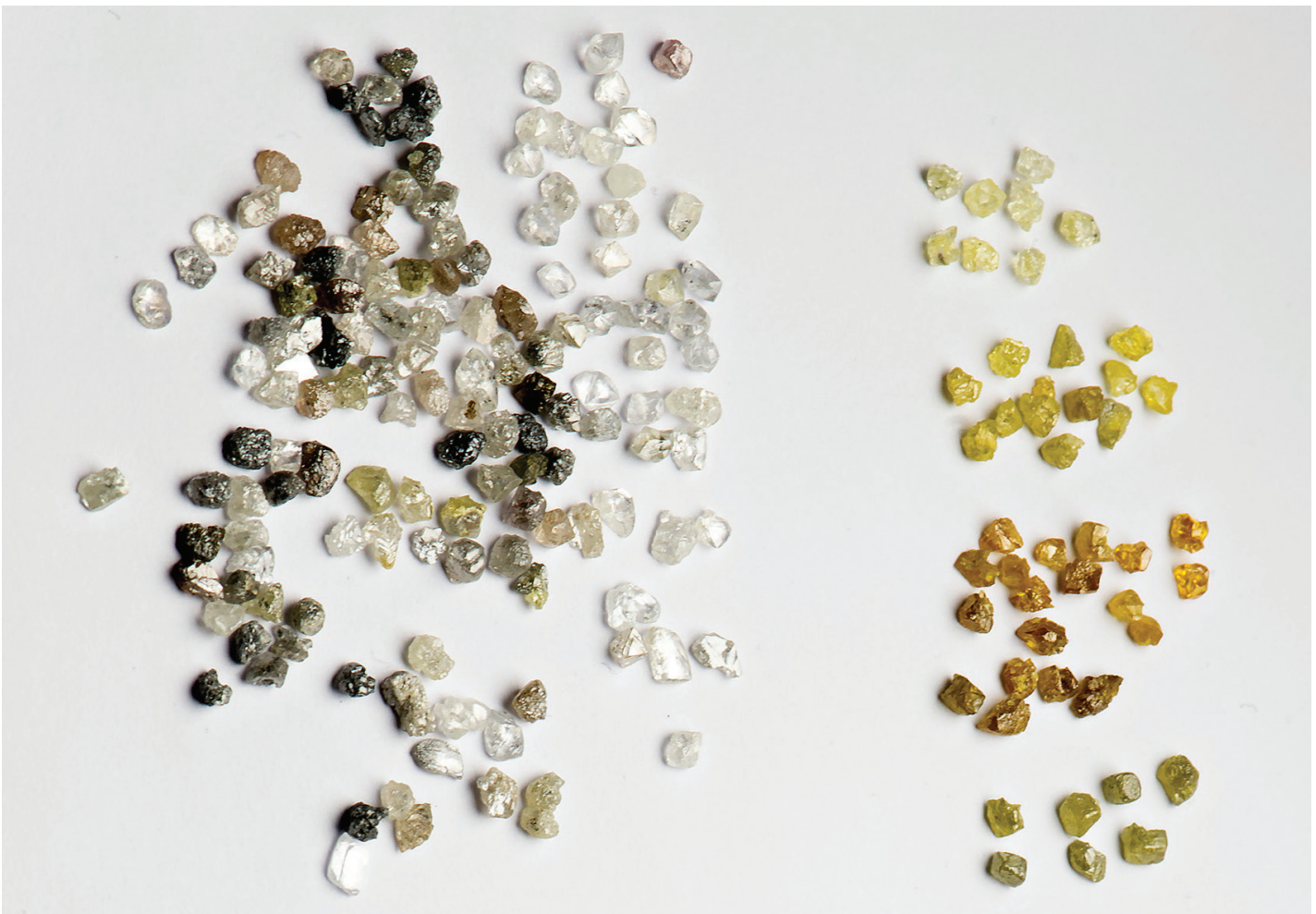
Transition Metals Corp. has a five-year strategic alliance with the Nunavut Resource Corp. subsidiary West Kitikmeot Gold Corp. to explore the Izok Corridor in the Kitikmeot Region. **Itchen Lake** is one of the Alliance's projects, and straddles the Nunavut-Northwest Territories border. Extensive historical work has been conducted on this gold property, and has included 80 drill holes on more than 70 gold occurrences in a banded iron formation. In 2012 and 2013, Transition Metals compiled the historic data for the property that verified historical assays and identified seventeen drill targets. The targets were to be drilled in 2015, but only a short prospecting and geophysical program was carried out, with no results reported. No work was reported in 2016.

Sabina Gold & Silver Corp.'s **Wishbone Gold** property is located approximately 60 km west of Sabina's Back River property. This gold property covers the southeastern portion of the Hackett River greenstone belt and was retained by Sabina when it sold off its VMS assets (Hackett River and the VMS portion of Wishbone) to Xstrata in 2011. The Wishbone Gold property hosts multiple prospects and mineralization is hosted in banded iron formation-hosted units. Diamond drilling, geophysical surveys, geological mapping, and prospecting have been conducted with the last reported work being a surface reconnaissance program conducted in 2013.

Cameco Corporation's **Aberdeen** and **Turqavik** uranium properties are located in the Thelon Basin and northwest of Baker Lake. Significant targets on the properties include: Tatiggaq, Qavvik, Ayra, Sandbould, Judge Sissons, and Mammoth. Uranium mineralization occurs as disseminated to massive pitchblende in veins and fracture-hosted zones along oxidation-reduction boundaries observed in drill core over wide intervals at depths between 80 and 180 m. The last reported work was in 2013 and consisted of land surveying, and surficial, structural, and geochemical studies.

## GUIDE TO ACRONYMS

<b>INAC</b>	Indigenous and Northern Affairs Canada	<b>NI 43-101</b>	National Instrument 43-101
<b>CNGO</b>	Canada-Nunavut Geoscience Office	<b>NIRB</b>	Nunavut Impact Review Board
<b>EDT</b>	Department of Economic Development and Transportation, Government of Nunavut	<b>NTI</b>	Nunavut Tunngavik Incorporated
<b>GN</b>	Government of Nunavut	<b>PGE</b>	platinum-group elements
<b>IOL</b>	Inuit Owned Land	<b>SEDAR</b>	System for Electronic Document Analysis and Retrieval
<b>KIM</b>	kimberlite indicator mineral	<b>VMS</b>	volcanogenic massive sulphide
<b>MPR</b>	Minerals and Petroleum Resources Division, Department of Economic Development and Transportation, Government of Nunavut		



The two recovered diamond populations from the processed bulk sample at Qilalugaq – *Courtesy of North Arrow Minerals Inc.*



## GLOSSARY

**base metal** – a general term applied to metals that corrode or oxidize easily, such as iron, lead, copper, or zinc.

**breccia** – a type of rock made up of angular rock or mineral fragments that have been broken apart by forces within the Earth and then cemented together. Breccia can be a good host for mineral deposits because the spaces created after the rock is fractured provide space for mineralization to occur.

**bulk sample** – the collection of a large amount of mineralized material from a deposit to determine its average metal or mineral content. Bulk samples are usually several hundred kilograms to several tonnes in size.

**carat** – a unit of weight used for diamonds and other gemstones. One carat is equivalent to 0.2 grams.

**deposit** – a natural concentration of a metal, gemstone or other mineral substance, which may be economically extracted but whose traits need a more detailed study to be classified as a resource. Also known as a mineral deposit.

**drilling** – the operation of extracting a vertical sample of bedrock or other surface material such as glacial till or clay in order to examine the occurrence of rock types and understand the geological structure

**Environmental Impact Statement** – a document outlining the effects of a development project on the environment prepared by the proponent of that project and presented to regulators, decision makers, and the public.

**fee simple** – a form of private land ownership in which the owner has the right to use, control access to, and transfer the land. Inuit hold fee simple title to Inuit owned land.

**geochemical survey** – the chemical analysis in a laboratory of soil, rock, or water from a defined area to identify abnormal concentrations of chemical elements that indicate the presence of metals, petroleum, or gemstones. Also known as geochemical exploration.

**geophysical survey** – the collection of information associated with bedrock using sensors that record electric, magnetic, seismic, or thermal data. The survey can be conducted from the air or the ground and is used by mineral exploration companies to detect physical properties of rocks such as magnetism, gravity or conductivity.



Meandering river west of Qikiqtarjuaq – *Courtesy of Government of Nunavut*

**grab sample** – a rock sample, collected by hand, in order to analyse whether valuable minerals or metals are present.

**greenstone belt** – a linear zone or “belt” of metamorphosed volcanic rocks known to host deposits of gold and other valuable metals. The characteristic colour comes from several different green minerals that make up the volcanic rocks. These belts can be tens to hundreds of kilometres in length and are found in several places across Nunavut.

**kimberlite** – a type of igneous rock that sometimes contains diamonds. Kimberlites can be composed of intrusive and extrusive rock. Kimberlite indicator minerals (KIM) are minerals found in glacial or other sediments that suggest the nearby presence of a kimberlite.

**mafic rock** – any igneous rock composed primarily of dark-coloured minerals, usually with a high iron and magnesium content; this term is also applied to those minerals as a group. Ultramafic rocks are rocks made up of greater than 90% mafic minerals, and some can be used as carving stone.

**platinum-group elements (PGE)** – any one of several metals including iridium, osmium, palladium, platinum, rhenium, rhodium, and ruthenium, that are highly resistant to tarnishing and corrosion and used in industrial applications as well as in jewellery.

**reserve** – a published estimate of the amount of naturally occurring metal, gemstone, or other mineral substance in a mineral deposit that can be economically extracted at the time of publication of the estimate. Classifying a deposit as a reserve indicates that a company has strong confidence in the quantity and quality of ore in that deposit. Mineral deposits must meet specific legal criteria to be classified as reserves.

**resource** – a published estimate of the amount of naturally occurring metal, gemstone, or other mineral substance in a mineral deposit, which is present in an amount that could allow for economic extraction of the material in the future. Classifying a deposit as a resource indicates that a company has moderate confidence in the quantity and quality of ore in that deposit, but that more exploration is needed to consider it a reserve. Mineral deposits must meet specific legal criteria to be classified as resources.



Channel sample site with Inukshuk, Mary River Project  
– Courtesy of INAC

**shear** – a type of deformation resulting from forces within the earth that cause parts of a rock mass to stretch, compress, or fracture. This deformation can form shear zones, bodies of rock with many parallel fractures that can be good hosts for hydrothermal mineral deposits.

**sulphide** – a group of minerals that contain the element sulphur. This group includes a large number of metal-bearing minerals that are sources for metals such as iron, zinc, and copper and are commonly referred to as economic minerals. Sulphide deposits can be massive (minerals are concentrated over small areas) or disseminated (minerals are distributed over large areas).



**MAP NUMBER (PAGE)** Bold project number and name signifies major or advancing project.

**Agnico Eagle Mines Limited**

300 **Amaruq** (14, 32, 33)

310 Fox (36)

313 Greyhound (36, 37)

**322 Meadowbank Mine** (14, 40, 41)

**323 Meliadine** (14, 41, 42)

311 Parker (36)

312 Peter (36)

**Anconia Resources Corp.**

104 **ATLAS** (49)

**Arctic Copper Corp.**

100 Arctic Copper (26)

**Arctic Star Exploration Corp.**

212 Stein (50)

**AREVA Resources Canada Inc.**

**601 Kiggavik (23, 47)**

602 St. Tropez (47)

**Aston Bay Holdings Ltd.**

102 Seal (27, 28)

103 Storm (27, 28)

**Aura Silver Resources Inc.**

313 Greyhound (36, 37)

**Auryn Resources Inc.**

304-308 Committee Bay Gold  
(Anuri-Raven, Four Hills-Cop,  
Inuk, Three Bluffs, West Plains)  
(34, 35)

**Baffinland Iron Mines Corporation**

**400 Mary River (14, 44, 45)**

**BHP Billiton Ltd.**

102 Seal (27, 28)

103 Storm (27, 28)

**Cameco Corporation**

603 Aberdeen (50)

604 Turqavik (50)

**Canadian North Resources and Development Corp.**

500 Ferguson Lake (45)

**Churchill Diamond Corporation**

209 Pelly Bay (49, 50)



Deformation of rock layers in a cliff face, Meta Incognita Peninsula – *Courtesy of CNGO*

**Commander Resources Ltd.**

105 Storm (29)

**Crystal Exploration Inc.**

201 Contwoyto (30)

202 Hood River (30)

203 Muskox (30)

**DAEWOO International Corporation****601 Kiggavik** (47)**Dunedin Ventures Inc.**

204 Kahuna (30, 31)

**Glencore plc**

106 Hackett River (49)

107 Wishbone (49)

**JCU Exploration (Canada) Co. Ltd.****601 Kiggavik** (47)**Indigenous and Northern Affairs  
Canada**

206 Jericho Mine (49)

**Kaizen Discovery Inc.**

101 Coppermine River (26, 27)

**Kivalliq Energy Corporation**

600 Angilak (14, 46, 47)

**Mandalay Resources Corporation**

329 Lupin Mine (50)

**MMG Limited**

105 Borden (49)

108, 109 Izok Corridor (High Lake,  
Izok Lake) (14, 49)**Montego Resources Inc.**

328 Kiyuk (50)

**North Arrow Minerals Inc.**

207 Luxx (49)

205 Mel (31)

210 Qilalugaq (50)

**Northquest Ltd.**

324 Pistol Bay (42, 43)

**Nunavut Resources Corp.**

303 CO-20 (34)

327 Itchen Lake (50)

**Peregrine Diamonds Ltd.**

200 Chidliak (28, 29)

208 Nanuq (49)

211 Qilaq (50)

**Sabina Gold & Silver Corp.****301, 302 Back River (George Lake,  
Goose Lake)** (33, 34)

330 Wishbone Gold (50)

**Silver Range Resources Ltd.**

314 Grumpy (37)

315 Happy Thought (37)

318 Hard Cash (38)

316 Parker Place (37)

325 Quartzite (43)

317 Uist (37)

**Stornoway Diamond Corporation**

210 Qilalugaq (50)

**TMAC Resources Inc.**

309 Elu Belt (35)

319-321 **Hope Bay** (Boston,  
**Doris North Mine**, Madrid)  
(14, 39, 40)**Transition Metals Corp.**

303 CO-20 (34)

327 Itchen Lake (50)

**WPC Resources Inc.**

326 Hood River (14, 50)

329 Lupin Mine (50)



# DISCOVER

THE GEOSCIENCE OF NUNAVUT THROUGH THREE INTERACTIVE TOOLS:

## EXPLORATION OVERVIEW

THE ONLINE VERSION OF THIS ANNUAL PUBLICATION OF EXPLORATION  
ACTIVITIES THROUGHOUT NUNAVUT

## REFERENCES

A DOWNLOADABLE LIBRARY OF SCIENTIFIC PUBLICATIONS, MAPS AND DATA

## SHOWINGS

FOR BROWSING THE MINERAL OCCURRENCES DATABASE  
WITH LINKS TO SUPPORTING REFERENCES

**[www.NunavutGeoscience.ca](http://www.NunavutGeoscience.ca)**

THE MOST AUTHORITATIVE STOP FOR NUNAVUT GEOSCIENCE INFORMATION.

