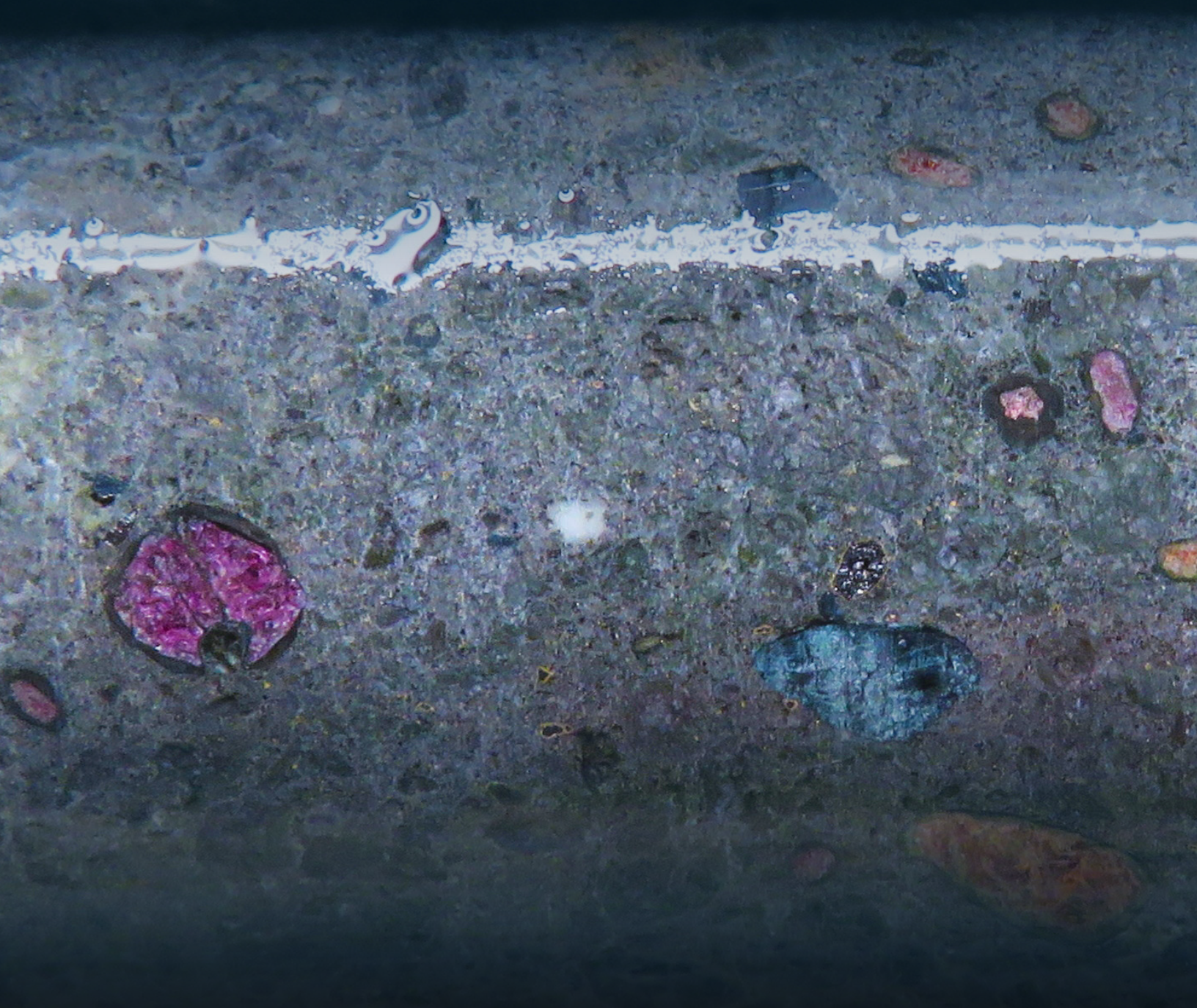


**OVERVIEW 2018**

# NUNAVUT

Mineral Exploration, Mining and Geoscience



Canada

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## ABOUT NUNAVUT: MINING, MINERAL EXPLORATION AND GEOSCIENCE OVERVIEW 2018

This publication is a combined effort of four partners: Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), 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 2018 and to make this information available to the public and industry stakeholders.

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 2018. Exploration work was completed and reported during 2017 or 2018 for all projects with active status in this publication. Projects with inactive status had exploration work last completed on them in 2015 or 2016, have active mineral tenure, and may have valid land use permits and/or water licences as issued by CIRNAC and the Nunavut Water Board.

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.

### ACKNOWLEDGEMENTS

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#### Cover photo:

*Kimberlite core from North Arrow Minerals' Mel project drillhole 18-ML-03, showing a pyrope garnet with olivine inclusions, and other mantle minerals. Courtesy of North Arrow Minerals Inc.*

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Peregrine falcon perched on Paleozoic carbonate outcrop, northern Baffin Island. *Courtesy of CNGO*

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 37,996. 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 per cent of Nunavut. Prospecting permits, mineral claims, and mineral leases are issued pursuant to the *Nunavut Mining Regulations* by Crown-Indigenous Relations and Northern Affairs Canada's (CIRNAC) 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 CIRNAC'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 2018 Map*. For details on mineral tenure, visit the Nunavut Map Viewer at <https://services.aadnc-aandc.gc.ca/nms-scn/gv/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 2018, and the accompanying figure illustrates the location and extent of this mineral tenure.

# LAND TENURE IN NUNAVUT

## MINERAL TENURE IN GOOD STANDING IN NUNAVUT

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Prospecting Permits	394	477	314	259	196	110	132	124	78	147
Claims	7,613	7,178	6,777	6,066	5,562	4,278	4,279	3,335	3,699	2,855
Leases	590	631	567	627	701	492	461	477	487	470

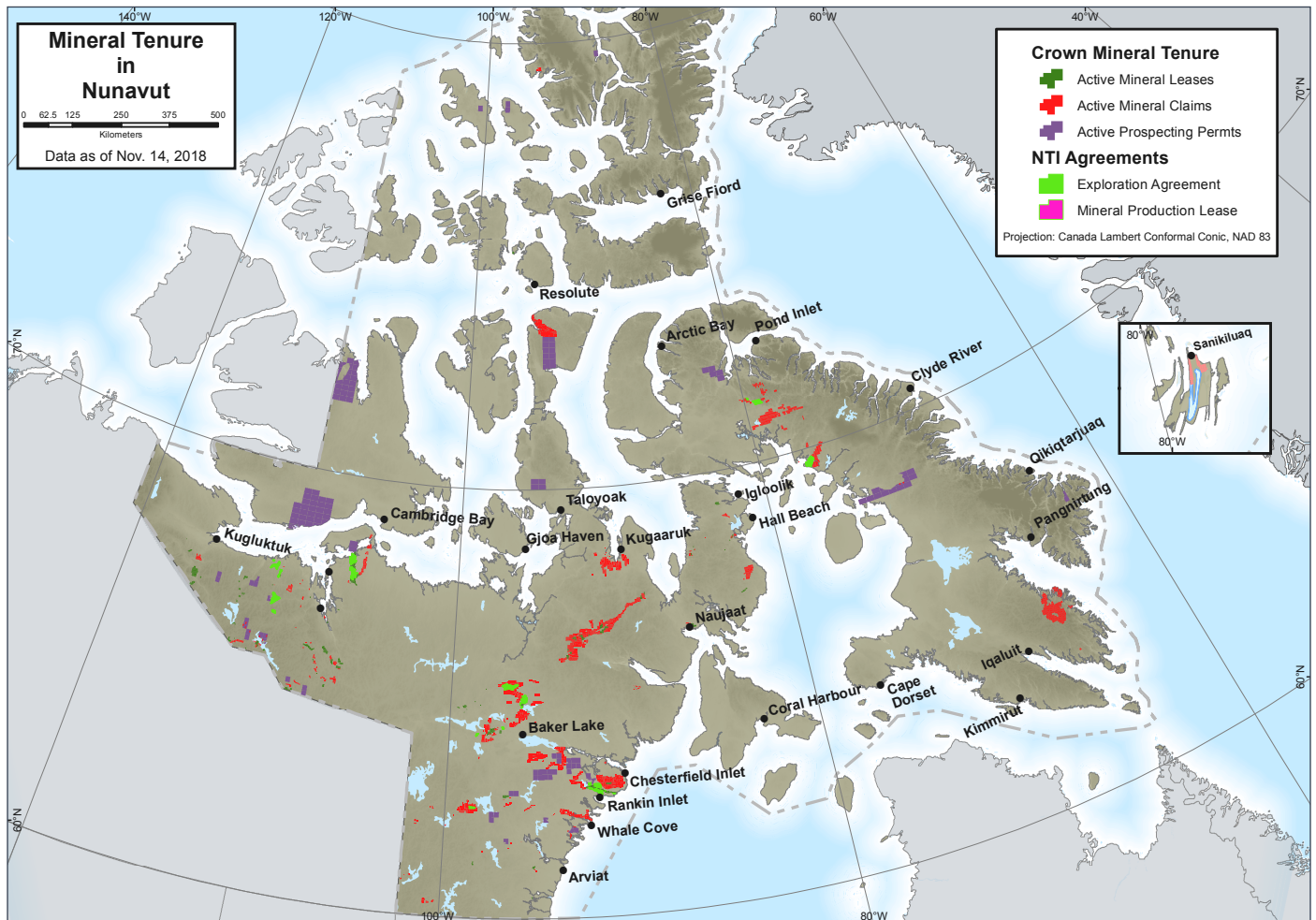
Source: CIRNAC

## EXPLORATION AND DEPOSIT APPRAISAL EXPENDITURES IN NUNAVUT

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018*
Juniors (Millions \$)	56.9	125.0	163.0	129.0	111.0	73.6	42.5	35.6	61.0	47.2
Seniors (Millions \$)	130.7	131.7	372.6	293.5	146.6	84.4	172.5	168.9	116.0	96.7
Total	187.6	256.7	535.6	422.5	257.6	158.0	215.0	204.5	156.7	143.9

Source: Natural Resources Canada

\*Revised spending intentions released October 2018





## CROWN-INDIGENOUS RELATIONS 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 2018 have declined, continuing a trend seen over the last several years. This reflects a still-challenging investment climate for junior companies and uncertainties regarding land access, but is partially offset by increased spending on development as several projects move towards production. This decrease in spending has resulted in Nunavut dropping from fifth to sixth for mineral exploration expenditures in Canada in 2018.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)’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.



Summer sea ice off the coast of Resolute Bay. Courtesy of CIRNAC

### ***Nunavut Planning and Project Assessment Act***

As required by the Nunavut Agreement, the *NuPPAA* establishes in legislation the powers, functions, objectives, and duties of the NPC and the NIRB. The Act came into force on July 10, 2015, and confirmed the overall approach to resource management in Nunavut that existed prior to that date. The *NuPPAA* made changes that clarified and strengthened elements of the regulatory regime. These changes were the result of close consultation and collaboration with the Government of Nunavut (GN), Nunavut Tunngavik Incorporated (NTI), the NIRB, and the NPC and included:

- » 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 responsible Minister in relation to the processing of applications;
- » the implementation of a ‘single window entry’ into the regulatory process that requires all project proposals in Nunavut to be first submitted to the NPC; and
- » provisions for the delegation of the powers, duties, and functions of the Minister of Crown-Indigenous Relations and Northern Affairs to a territorial Minister.

### ***Nunavut Waters and Nunavut Surface Rights Tribunal Act***

The *Nunavut Waters and Nunavut Surface Rights Tribunal Act* legislation which came into effect in 2002, established 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**

In July 2016, the Minister of Crown-Indigenous Relations and Northern Affairs Canada announced the appointment of a Chief Federal Negotiator to negotiate an Agreement-in-Principle for the devolution of land, rights in respect of waters and natural resource management in Nunavut. The negotiation will entail a transfer from the federal government to the territorial government of these province-like powers. With this appointment, the Government of Canada continues the formal negotiation process with the Government of Nunavut and Nunavut Tunngavik Inc. Devolution is an important step in the political and economic development of the territory. The goal of giving Nunavut greater control over its lands and resources is to ensure that Inuit and northerners fully participate in realizing the territory’s economic potential and that Nunavut becomes an even more attractive place to live, work, and invest.

#### **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.

#### **Crown-Indigenous Relations 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 2018, there are 147 active prospecting permits, 2,855 mineral claims, and 470 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 6.12 million hectares (ha) as of November 2018.

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 2018, 20 reports documenting \$4.12 million worth of work were released to the public.

## STEWARDSHIP OF LAND AND WATER

Several divisions of Crown-Indigenous Relations 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 CIRNAC, and enabling monitoring that informs decision-making.

The Impact Assessment Division and a socio-economic analyst participate in the Nunavut Impact Review Board's (NIRB) environmental assessments. In 2018, the Impact Assessment Division provided environmental and socio-economic expertise and technical review comments to the NIRB for environmental assessments of eight major project proposals and 66 smaller proposals. The division also reviewed four annual monitoring reports, submitted by proponents of major projects, to ensure they complied with terms and conditions of existing project certificates.

CIRNAC is responsible for the co-management of the territory's freshwater resources along with the Nunavut Water Board. CIRNAC's Water Resources division participates as an intervenor in water licensing processes of the Nunavut Water Board. In 2018, the CIRNAC Water Resources division provided technical advice on 170 water licence processes including applications, amendments, renewals, cancellations, and management plans.

The Water Resources division is also involved in monitoring water quality across Nunavut, and works in partnership with Environment and Climate Change Canada (ECCC) to monitor water quantity. Currently, there are 24 hydrometric stations across Nunavut.

Water quality is monitored through the review of water quality monitoring reports and participating in water quality monitoring initiatives. One of these initiatives is part of a Memorandum of Agreement with the Kivalliq Inuit Association and involves the monitoring of water quality around mining and exploration activities in the Kivalliq Region. Another initiative is concentrated in and around the City of Iqaluit and is conducted solely by the Water Resources Division.

The Field Operations Division ensures compliance with the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*, the *Territorial Lands Act*, the *Nunavut Planning and Project Assessment Act*, the *Arctic Waters Pollution Prevention Act* and related regulations. They also conduct inspections of sites that hold land-use permits, leases, and water licences to ensure compliance with the terms and conditions contained in these authorizations.

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 Secretariat

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

In 2018-19 the NGMP funded 14 research projects with a total budget request of \$820,000. Work continues on implementing the science program for the Inuu'tuti cumulative effects water monitoring project. Inuu'tuti is a watershed-based monitoring program for the Baker Lake Basin and is a collaborative initiative managed via a steering committee made up of the NGMP, CIRNAC's Water Resources Division, the Kivalliq Inuit Association, and the Nunavut Water Board. In 2017 NGMP worked with community partners and researchers to implement a community-based water monitoring program that monitors impacts and effects of importance to the residents of Baker Lake. The community-focused data collected will complement the work being done by Inuu'tuti at the watershed level.

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The Government of Nunavut (GN) is committed to supporting a strong and diversified minerals and petroleum industry based on best practices of sustainable development and partnerships between Nunavummiut and industry. The Department of Economic Development and Transportation (EDT) supports the development of a streamlined, co-managed permitting and regulatory regime and provides direct assistance in the development of new geoscience information, financial and technical support to prospectors, the enhancement of investor confidence and liaison with representatives from industry, local service sectors, and Nunavummiut.

Three important strategies that outline the GN priorities for resource development have been developed over the years. The first *Parnautit: A Foundation For The Future*, is the Mineral Exploration and Mining Strategy was introduced in 2007, and aims 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. These strategic visions are shared between several partners, including the mining industry, Nunavut Tunngavik Incorporated (NTI) and the Government of Canada.

In March 2018, the GN released *Turaaqtavut: Where We Are Aiming To Go* (<https://gov.nu.ca/information/turaaqtavut-0>). It reflects the needs and priorities established by the 5th Legislative Assembly. It recognizes a growing mining sector and the importance it plays in the economy of Nunavut. Development of natural resources is a challenge in the arctic environment where ecosystems are vulnerable and subject to a changing climate. Government must engage actively in co-management and development activities “to ensure that Nunavummiut can enjoy a strong relationship with our land for generations to come.” At the same time, it is important to diversify and improve economic conditions to improve community self-reliance through local employment in a variety of pursuits, including traditional arts and culture, small businesses, mining, and fisheries to name a few. Developing and managing the mineral resource benefits in the mining sector is key for establishing long-term prosperity for Nunavummiut. Control of land and resource management responsibilities is essential to the long-term economic development and self-sufficiency of Nunavut.

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



Flying into Sanikiluaq over Flaherty Island. Courtesy of GN

Three mines currently operate year-round in Nunavut. There is Agnico Eagle Mines Ltd. Meadowbank gold mine in the Kivalliq, Baffinland Iron Mines Corporation's Mary River iron mine in the Qikiqtani, and TMAC Resources Inc. Hope Bay gold mine in the Kitikmeot. Nunavummiut from communities across the territory are employed in a variety of jobs at the mines and are developing careers in the resource sector through the assistance of various training and incentive programs. The GN is committed to supporting 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.

### 2018 ENERGY AND MINES MINISTERS' CONFERENCE

GN Minister of Mines David Akeeagok and Energy Minister Jeannie Ehaloak together with the Federal Minister of Natural Resources Amarjeet Sohi hosted Provincial and Territorial Ministers in Iqaluit for the annual Energy and Mines Ministers' Conference (EMMC) from August 12-14, 2018. The theme this year addressed the importance of Connecting Communities to Resources. The meeting concluded with an agreement to act to increase Canada's economic competitiveness and to maintain a sustainable environment in the resources sectors by eliminating barriers to investment, promoting market diversification, and improving the efficiency and timeliness of regulatory processes.

Indigenous leaders and industry associations joined ministers to discuss the role of energy and mining in growing our economy and the importance of competitiveness and certainty for sustainably developing natural resources. The need for critical infrastructure to develop Canada's wealth in natural resources, particularly in the North, was recognized as well as the importance of fostering partnerships and inclusion of Indigenous peoples in the resource economy. See the news release regarding EMMC 2018 for more details, <https://gov.nu.ca/edt/news/energy-and-mines-ministers-agree-improving-competitiveness-and-environmental-sustainability>.

### MINERAL EXPLORATION AND MINING STRATEGY

The GN's Mineral Exploration and Mining Strategy *Parnautit* was outlined in 2007. The strategy aims 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: (1) the territory's regulatory and taxation regimes, (2) workforce training, (3) infrastructure development, and (4) environmental baseline data availability.

### URANIUM POLICY STATEMENT

The Government of Nunavut's *Uranium Policy Statement* (<http://www.uranium.gov.nu.ca/>) was released in 2012 and its principles underscore the 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 established by the Nunavut Land Claims Agreement in the regulation of uranium exploration and mining. Additionally, the GN recognized that uranium is subject to international agreements and national laws, and supports the mandate and responsibilities of the Canadian Nuclear Safety Commission.

### GEOSCIENCE INFORMATION

The GN remains strongly committed to supporting public access to geoscience information for the territory and recognizes how important this is for encouraging new exploration investment in Nunavut. EDT provides core funding to the Canada-Nunavut Geoscience Office (CNGO) in Iqaluit and program support for territorial mapping and geological research.

Additional support from federal government programs such as the Strategic Investments in Northern Economic Development (SINED), administered by the Canadian Northern Economic Development Agency has supported geoscience and environmental mapping projects and provided support to the carving stone program over the past several years.

### RESOURCE MANAGEMENT

#### Impact Assessment and Monitoring

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

The EART is composed of two committees and a lead coordinator. EDT provides staff to act as the lead coordinator and project management members for the Socio-Economic Assessment Committee (SEAC), and the Department of

Environment leads the Environmental and Human Health Assessment Committee (EHHAC). Together, the EART reviews environmental impact statements submitted to the Nunavut Impact Review Board and actively participates in technical meetings, hearings and regulatory workshops.

EDT acts as the lead for the three Regional Socio-Economic Monitoring Committees (SEMC) in Nunavut. The primary purpose of the committee is to monitor the socio-economic impacts and benefits associated with major resource developments and to determine if they are occurring as anticipated, according to each individual project environmental impact statement.

The regional SEMC also address project-specific terms and conditions, and provide a venue for a variety of stakeholders to take part in meaningful discussions concerning resource development issues.

### Petroleum Resources

Petroleum exploration in Nunavut began in 1962 and occurred throughout the territory until 1986. Oil production that took place at the Bent Horn oil field on Cameron Island from 1985 to 1996 produced approximately three million barrels of oil. Nunavut which covers approximately 20 per cent of Canada's area territory is estimated to potentially hold a third of Canada's total petroleum resource endowment. Nunavut's discovered resources are 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.

In 2017, the Nunavut Impact and Review Board (NIRB) was appointed by then Minister of Indigenous and Northern Affairs Canada to conduct a Strategic Environmental

Assessment (SEA) of the Baffin Bay and Davis Strait area. The NIRB will assess potential oil and gas activity and the associated impacts and benefits using western science and Inuit Qaujimajatuqangit. The NIRB will provide recommendations to the Government of Canada, for consideration in the review of the Arctic offshore oil and gas moratorium decision scheduled for 2021. The GN actively participates in the SEA process including attending community meetings, producing information material for communities, and providing advice to the SEA working group which is composed of CIRNAC, NTI, QIA, NIRB, and the GN. The final NIRB meeting will occur in March 2019 in Iqaluit, and the report will be submitted in the following months. The GN is committed to ensuring that any development of hydrocarbon resources occur in a responsible way and in a manner that is in the interest of Nunavummiut.

### PROSPECTOR DEVELOPMENT

#### Introduction to Prospecting

Each year, staff geologists at EDT offer a one week Introduction to Prospecting Course (IPC) in several communities across Nunavut. This year, 43 participants in seven communities (Gjoa Haven, Coral Harbour, Naujaat, Whale Cove, Igloodik, Pangnirtung, and Sanikiluaq) completed the training. The course provides basic training to enhance prospecting skills and encourages interest in participants to apply their knowledge of the land to mineral exploration. Since 2000, the course has been delivered several times in each community across Nunavut and over 1,200 certificates have been awarded to participants who have completed the training.



Dolomitized stromatolites of the Mavor Formation, near Sanikiluaq, Belcher Islands. *Courtesy of Government of Nunavut*

### Nunavut Prospectors Program

The Nunavut Prospectors Program (NPP) has been offered by EDT since 2000 to encourage mineral prospecting in Nunavut. Many participants who have successfully completed IPC have subsequently applied to the NPP to start their own projects. Successful applicants in the program may receive up to \$8,000 per year as a contribution towards work expenses. 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 based on the project proposal and past performance of the applicant in the NPP. Four individual prospecting projects were supported in 2018 through this program.

### COMMUNITY EDUCATION AND TRAINING

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 preparatory and mine training programs for Nunavummiut. EDT contributes up to \$200,000 per year and for 2017-2018 included:

- » Driller's Assistant Training in partnership with Kitikmeot Corporation for 11 trainees;
- » Financial Literacy workshop in partnership with the Qikiqtani Inuit Association which reached 274 participants; and
- » Work Readiness Program and Class 3/Airbrake Training in partnership with the Hamlet of Arviat with 29 trainees graduating this year.

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 2017-2018 other initiatives included support for science technology, engineering, and mathematics camps and Workshops in partnership with ACTUA.

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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 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.

NTI uses a map selection system for the acquisition of mineral rights. Interested parties submit an expression of interest to NTI 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. For example, the terms may include 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. However, in order to gain access to the land, 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 state that NTI will support exploration and mining provided:

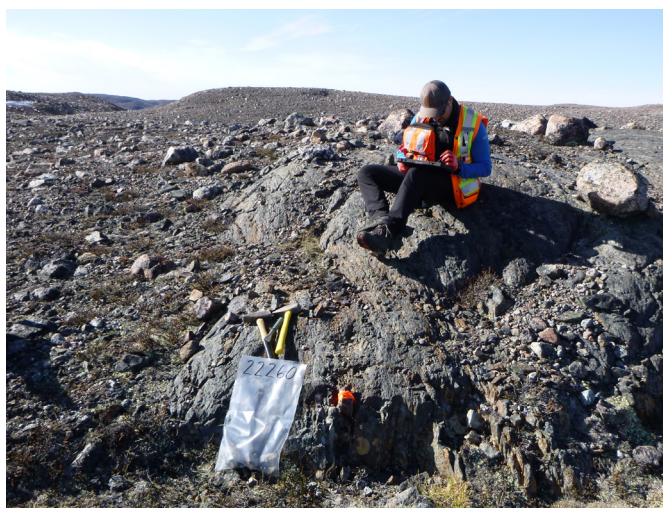
- » there are minimal negative environmental and socio-economic impacts;
- » that Inuit cultural and social needs are respected;
- » that investment in Nunavut is encouraged;
- » that land-use conflicts are resolved equitably; and
- » that Inuit economic opportunities are maximized.

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 the current active MEAs and their locations.

**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.



Geologist sampling amphibolite-iron formation outcrop, Mary River project. *Courtesy of BIMC*

## PROJECTS ON INUIT OWNED LAND

### Kitikmeot Region

High Lake <sup>1</sup>	MMG Canada Limited
Hope Bay <sup>2</sup>	TMAC Resources Inc.
Hood River	Inukshuk Exploration Incorporated
Committee Bay	North Country Gold Corp.
WestKit	NRC Exploration Incorporated
Willy - Bandit	Victoria Copper Inc.

### KIVALLIQ REGION

Angilak/Lac Cinquante	ValOre Metals Corp.
Amaruk	Agnico Eagle Mines Limited
Meadowbank <sup>3</sup>	Agnico Eagle Mines Limited
Meliadine <sup>4</sup>	Agnico Eagle Mines Limited
North Thelon/Ukalik	Forum Uranium Corp.
Peter Lake	Meliadine Gold Ltd.
Huckleberry/ Heninga Lake	John Tugak

### QIKIQTANI REGION

Foxe	ValOre Metals Corp.
Baffin Gold	Commander Resources Ltd.
Haig Inlet Iron	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.

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NTI Lands, Interactive Maps & Data



The Canada-Nunavut Geoscience Office (CNGO) was established in September 1999 following the creation of Nunavut. The CNGO serves as Nunavut's 'de-facto' Geological Survey. Based in Iqaluit, Nunavut, the office

comprises six professional staff with expertise in Precambrian, Paleozoic, and Quaternary geology, GIS, and on-line geoscience data dissemination.

The CNGO is co-funded and co-managed by Natural Resources Canada – Lands and Minerals Sector (NRCan-LMS); the Government of Nunavut's Department of Economic Development and Transportation (GN-EDT), and Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC). An operating agreement outlines and governs the operational and funding context provided to the CNGO; this agreement was renewed recently until 2023. A CNGO Management Board, with a representative from each of the three partners and an ex-officio representative from NTI, provides scientific and operational oversight for the office. The three government partners provide 'core funding' to the CNGO; this funding covers salary and basic operations and maintenance dollars.

The office seeks project funding from other sources, principally Strategic Investments in Northern Economic Development (SINED) funding from the Canadian Northern Economic Development Agency (CanNor). The CNGO has conducted much research under these SINED agreements. There have been four earlier funding programs: 1) 1999-2004, 2) 2004-2009, 3) 2009-2014, and 4) 2014-2016, with the fifth program announced recently for 2018 and beyond.

The CNGO initiates and conducts a wide range of geoscience research involving mapping, interpreting, and reporting on the geological features and resources of Nunavut, with partners from other governments, universities, industry, and communities. The CNGO's mandate is to: 1) develop capacity in geoscience, 2) maintain an accessible geoscience knowledge base, 3) promote sustainable and responsible development of Nunavut's mineral and energy resources, and 4) increase awareness of the importance of earth science for Nunavummiut. Through its activities, CNGO aims to assist northerners by ensuring that the new geoscience information is accessible to all to make knowledgeable decisions (e.g., land-use, infrastructure) in the territory for the future.

Activities in 2018 focused on four key areas: 1) geoscience (mapping) for responsible natural resource development; 2) geoscience (mapping) for climate change and permafrost; 3) geoscience (mapping) for infrastructure, and 4) data dissemination, capacity building, and public outreach.

Summaries of each project are provided below; detailed papers with preliminary observations and interpretations are included in the *Summary of Activities 2018* volume available for download at [www.cngo.ca](http://www.cngo.ca).

### 1. GEOSCIENCE FOR RESPONSIBLE NATURAL RESOURCE DEVELOPMENT

#### Tehery Lake-Wager Bay bedrock mapping (*final year*)

NRCan continued with the Tehery-Wager geoscience mapping activity (2015-2019) as part of NRCan's Geo-mapping for Energy and Minerals (GEM-2) Rae program. Earlier participants on this project were CNGO (2015-2017) and researchers from Canadian universities (Dalhousie University, the University of British Columbia–Okanagan, Université Laval, University of New Brunswick, and Université du Québec à Montréal (UQAM)). The overall focus of the entire project was targeted bedrock and surficial geology mapping, stream-water and stream-sediment sampling, and other thematic studies. No fieldwork occurred in 2018; however, a M.Sc. student (I. Therriault at UBC-O) continued her thesis research work determining the geochronological constraints on deformation in the Wager shear zone. This shear zone, located on the northwestern coast of Hudson Bay, is a major east-trending zone of high strain.

#### Fury-Hecla project, northwestern Baffin Region (*continuing project*)

The CNGO identified a new multi-year and multi-faceted project over the northwestern portion of Baffin Island, north of Igloodik and the Fury and Hecla Strait to Admiralty Inlet and south of Arctic Bay. The project area is the last area of the island without modern geoscience work – for example, aeromagnetic surveys or bedrock and surficial geology mapping – at a more detailed scale than a general scale (1:1,000,000). A small area south of the Fury and Hecla Strait – encompassing northern Melville Peninsula and the southern part of the Fury-Hecla sedimentary basin – is also included with this project.

This project encompasses an area of roughly 40,000 km<sup>2</sup> and covers parts of six National Topographic System (NTS) map sheets: 47C (Encampment Bay) and 47D (Igloodik) south of the Fury and Hecla Strait, and 47E (Erichsen Lake), 47F (Agu Bay), 47G (Berlinguet Inlet) and 47H (Phillips Creek), all north of the strait. The collaborative project is led by the CNGO but involves multi-agency and university collaborators working on thematic research projects. Three professors (Dr. Ielpi, Laurentian University; Dr. Halverson, McGill University; and Dr. Stevenson, UQAM) successfully secured a NSERC Strategic Partnership Grant for two years for them and multiple graduate students to also conduct collaborative research on the Fury-Hecla Basin.

As preparation for the mapping work of 2018, a new regional airborne magnetic and radiometric survey was initiated in 2017 over the southern portion of the project area. Airborne geophysical surveys are used commonly as first steps in a mapping project and are especially useful in areas with limited outcrop. The geophysical survey was flown in two phases



Geologist taking measurements at an outcrop, northern Baffin Island, CNGO's Fury and Hecla project. *Courtesy of CNGO*

(due to weather and temperature factors); three-quarters of the survey was flown September to early November, and recommenced in February and March. A total of 77,067 line-km was completed, representing 93 per cent of the proposed survey area. Interpretation of the survey is on-going.

Four components made up the 2018 summer field mapping: 1) bedrock mapping (five weeks), 2) Paleozoic stratigraphic mapping (10 days), 3) surficial mapping (10 days), and 4) targeted thematic mapping (five weeks) involving the NSERC researchers.

**Bedrock mapping:** A significant proportion of the southern area of this project is underlain by basement rocks, all presumed to be Archean in age. These rocks include granitoid rocks (tonalite–granodiorite orthogneiss that hosts mafic–ultramafic intrusions; monzogranite–quartz monzonite; massive syenogranite–quartz syenite; and pegmatite and felsic dykes) and supracrustal panels (metamorphosed quartzite; semipelite–pelite rocks; iron formation; mafic volcanic rocks; and ultramafic bodies). A nonconformity surface separates the Archean basement components from the overlying Mesoproterozoic Fury and Hecla Group sedimentary rocks.

**Paleozoic mapping:** Paleozoic (Ordovician) rocks are exposed on the unnamed peninsula in southwestern NTS area 37F and northwestern NTS area 37C on northern Baffin Island. Fieldwork conducted in 2018 provided essential data for more detailed stratigraphic division; the ensuing research

in the office will evaluate the ages of different units to make stratigraphic correlations with other areas in the Foxe Basin, and help evaluate the petroleum potential of the Foxe Basin.

**Surficial mapping:** Fieldwork was conducted north of Fury and Hecla Sound to document glacial dynamics at a regional scale. Glacial geomorphology and composition of till pebbles was interpreted and generalized from field observations and surficial geology maps. Use of satellite imagery (SPOT6), high-resolution digital elevation (HRDEM), and bathymetric modeling increased the level of knowledge for this area. Glacio-dynamic mapping shows important contrasts in glacial erosion and transport. A synthesis of new and published clast lithology counts datasets highlights the presence of an ice divide over the Saputing Lake-Gifford River area and of ice streams in the Bernier Bay, Fury and Hecla Strait, and Whyte Inlet areas.

**Thematic mapping:** Four studies on various aspects of the Fury-Hecla sedimentary basin undertaken by professors and their graduate students under the NSERC-funded grant are briefly described below. 1) One study (W. Greenman, Laurentian University) measured five stratigraphic sections of the sedimentary rocks of the basin to reconstruct and date the depositional environments of these rocks, and determine how they compare, over time, with interpreted equivalents. 2) The sedimentology of the sandstone-dominated units in the basin was studied (M. Patzke, Laurentian University) to interpret the types of environment in which the rocks were originally deposited. 3) Mafic and ultramafic intrusions north of the basin were studied (P. Bovingdon, Laurentian University) to constrain their timing of emplacement and of regional deformation, and determine their associated economic potential. 4) The basin also contains volcanic basalt flows and intrusive gabbro mafic dykes. This study (F. Dufour, UQAM, and McGill University) focused on describing each of these units to improve the understanding of the geological history of the Fury and Hecla Basin.

### **Paleozoic Stratigraphy, Boothia Peninsula (continuing project)**

With the tectonic and geographic location of Boothia Peninsula, the Paleozoic rocks in this area must be correlative or have a connection with those on the high Arctic islands. Work in 2017 on these rocks was a subproject of the GEM-2 Boothia-Somerset Integrated Geoscience Project led by NRCan. The aim of CNGO's (Dr. Zhang's) work was to evaluate the Ordovician stratigraphy on Boothia Peninsula and focused on sampling carbonates of two sections within the Ordovician sequence on the peninsula. Results will provide essential data for more detailed stratigraphic divisions, evaluating ages of different stratigraphic units, making stratigraphic correlations with other Arctic islands, and define the stratigraphic position and geographic distribution of any petroleum source rocks, if present.



**Paleozoic Stratigraphy, Hudson-Ungava Project  
(continuing project)**

CNGO and NRCan-GSC researchers have collaborated since 2008 on unravelling the Paleozoic history and evaluating the hydrocarbon potential of Paleozoic rocks in Hudson Bay and Foxe and Hudson Strait basins. Scientific knowledge of the stratigraphy in Hudson Bay and Foxe Basin area has been improved significantly through this work, but the knowledge about Paleozoic stratigraphy and petroleum potential in Hudson Strait area has remained static since the 1970s. In 2016, under GEM-2 programming, the CNGO (Dr. Zhang) conducted detailed work on Akpatok Island, south of Baffin Island in the northern portion of Ungava Bay, and the only location in Hudson Strait where the Paleozoic rocks are exposed. Continuing research includes work on: 1) detailed and accurate stratigraphic division and correlations to identify the correct stratigraphic position of the hydrocarbon source rock on this island, and 2) the organic-rich samples from Hudson Strait to evaluate the hydrocarbon potential and thermal history. This work will refine the stratigraphy and determine the precise stratigraphic position of the potential hydrocarbon source rocks on Akpatok Island and the thermal history in Hudson Strait Basin.

**Paleozoic Research, Sedimentary xenolith study,  
Hall Peninsula (continuing project)**

CNGO (Dr. Zhang) has led a study of sedimentary xenoliths preserved in the kimberlites on Hall Peninsula since 2012, collaborating with researchers from the former Peregrine Diamonds, universities, and GSC. Numerous conodont microfossils collected from carbonate xenoliths enable the reconstruction of lost Ordovician and Silurian strata. The wide ranges of conodont Colour Alteration Indices (CAI) are used as economic and efficient geo-thermometers for kimberlite emplacement temperatures. The organic-rich black shale xenolith supports the presence of Paleozoic petroleum source rock in the nearby Cumberland Sound. Continuing research includes: 1) detailed biomarker studies on the organic-rich black shale xenoliths to identify the paleo-environment and relationships with the Ordovician organic-rich interval on southern Baffin Island, and 2) collecting more carbonate xenolith samples to try to determine if any younger or older strata than those already recognized occur on Hall Peninsula. This work will improve our knowledge about the distribution of Paleozoic strata and erosion history since the Cretaceous on Baffin Island, the distribution of petroleum source rocks in the Foxe Basin area, and provide economic and efficient tools to analyze kimberlite emplacement temperatures.



Glacial erratic with sledgehammer for scale, northern Baffin Island, CNGO's Fury and Hecla project. Courtesy of CNGO

**Proterozoic Sedimentary Basins of Nunavut: Sedimentology and stratigraphy of the Paleoproterozoic Kimerot Group in the Bear Creek Hills, Kilohigok Basin Kitikmeot Region (continuing project)**

The Kilohigok Basin has been the subject of a few field mapping campaigns in the past, and its lowermost stratigraphic interval – the Kimerot Group – nonconformably overlies metasedimentary basement rocks of the Archean Yellowknife Supergroup. In 2017, researchers from Laurentian University studied this basin (S. Michel and A. Ielpi) for the sedimentological and stratigraphical relationships of the Kimerot Group to shed light on the depositional settings of the Kilohigok Basin's early developmental stages.

**2. GEOSCIENCE MAPPING FOR CLIMATE CHANGE AND PERMAFROST**

**Western Hudson Bay: Permafrost-infrastructure analysis and susceptibility to effects of climate change and warming conditions (continuing project)**

Climate change and warming conditions are occurring in the north. Permafrost is an important feature and component of the western Hudson Bay area landscape. To date, there has been limited permafrost monitoring and studies along this coast. This limited baseline information – such as current permafrost condition – hinders future decisions concerning infrastructure development. Significant infrastructure developments and the maintenance of existing older infrastructure in this western Hudson Bay region are being considered by various levels of government to support the natural resource sector and communities for economic development.

In 2018, NRCan-GSC scientists continued a collaborative project with CNGO with a geoscience surficial map compilation project started 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, and 55L). The objective of this project is to compile existing aggregate, mineral potential, surficial, and permafrost data for this area. These surficial geology and permafrost studies are using satellite images (Radarsat dINSAR™, RapidEye™) for the map compilation and interpretation.

As part of an existing permafrost study near Rankin Inlet, scientists tested using unmanned aerial vehicles (UAV) and DEM (digital elevation modelling) for landscape reconnaissance and mapping periglacial features in permafrost terrain. Acquired images are very effective for landscape reconnaissance, surficial geological mapping, and permafrost interpretation.

### 3. GEOSCIENCE (MAPPING) FOR INFRASTRUCTURE

#### Mapping and Characterization of the Seabed of Frobisher Bay to Support Infrastructure Development, Exploration and Natural Hazard Assessment (*continuing project*)

Frobisher Bay is the body of water adjacent to the rapidly growing city of Iqaluit and has a long history of geological and ecological study, providing long-term datasets and study areas. Coastal regions of the Canadian Arctic face increasing pressures from climate change, resource exploitation, and infrastructure development, with Frobisher Bay presenting interesting new opportunities – and challenges – for growth. The bay faces potential impacts from several economic sectors – 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, all freight and supplies arriving by sea come ashore across the tidal flats at the head of Koojesse Inlet, and the construction of a new deep-water port will address this re-supply issue. Other development projects include mineral exploration activities at the Chidliak diamond property (recently taken over by De Beers), potential hydroelectric development, and a proposed fibre-optic data cable. A variety of studies (i.e., near-shore ice, tidal currents, iceberg scour, submarine landslides, natural gas or petroleum seeps, and coastal stability) will provide a better understanding of conditions to aid maintenance of existing facilities, construction of new facilities, and help determine the viability of channel approaches.

ArcticNet, a consortium of various partners based out of Memorial University, has been collecting data in Frobisher Bay for many years. Starting in 2014, the CNGO, GN-EDT, and GN-Department of Environment participated in, and supported, ArcticNet research using the GN's *RV Nulijuk* research vessel. Over the past four years, targeted high-resolution multibeam bathymetric mapping coverage has increased around SE Baffin Island (R. Deering, Memorial University), allowing for the characterization of the seafloor in the basin. Inner Frobisher Bay is shown to have a primarily muddy bottom, but with an overall morphology much more complex than typical for a fiord. Adding to the complexity caused by the bedrock structure are various deglacial features including a number of recessional moraines. Natural seabed (geo-) hazards in the bay have the potential to trigger submarine slope failure and sediment mass transport events that may in turn affect port infrastructure development. Several marine geohazards have reshaped postglacial sediments, as evidenced by fields of pockmarks, seabed scours formed by sea ice and icebergs, and 246 submarine slope failures.

#### Contribution to the Strategic Environmental Assessment (SEA) for Baffin Bay and Davis Strait (*new project*)

The Scott Inlet Basin along the Baffin Shelf area contains an active petroleum system with significant potential for a viable hydrocarbon discovery. Researchers and politicians have been interested for decades in the origins and significance of well-known and active oil seeps. Continued research would improve the understanding of the geological history of the area; mapping to date of this area and the seeps is sparse. Dr. Zhang (CNGO) has proven that 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 the petroleum seeps. Results to date suggest that the oil seeps in Baffin Shelf area may have originated from Paleozoic source rocks that were deeply buried by Mesozoic rocks.



Geologist on traverse in a streambed, next to a Paleozoic carbonate cliff, CNGO's Fury and Hecla project. *Courtesy of CNGO*

## CANADA-NUNAVUT GEOSCIENCE OFFICE

Additionally, the Nunavut Impact Review Board (NIRB) is currently coordinating a Strategic Environmental Assessment (SEA) in Baffin Bay and Davis Strait. The purpose of this SEA is to understand the types of offshore oil and gas related activities, and their risks and benefits, that could possibly occur in the Canadian offshore waters of Baffin Bay and Davis Strait. When the SEA is complete, the NIRB will provide a report and recommendations to the Federal Government to inform its future decision making processes. As part of the SEA, geologists from the GN-EDT, a partner in the CNGO, spent time on the Government of Nunavut's *RV Nuliajuk* in the area of these Scott Inlet Basin oil seeps to continue studying these seeps.

### 4. DATA DISSEMINATION

Public geoscience information, and its dissemination and availability, are key for any jurisdiction to realize and support a successful mining and exploration sector. Industry, governments, and the public require free, well-managed, and publicly web-accessible data to make sound investment decisions and understand resource potential.

In Nunavut, researchers and partners, including the GN-EDT and CNGO, ensure that any programming and research work and the collected data is made available to the public and all stakeholders in a timely manner. CNGO and its partners (GN and CIRNAC) co-manage and disseminate data through two websites ([cngo.ca](http://cngo.ca) and [NunavutGeoscience.ca](http://NunavutGeoscience.ca)). Work to migrate a portion of the services behind [NunavutGeoscience.ca](http://NunavutGeoscience.ca) to a new platform and software (AWS) started in the last few years, and continued in 2018. Two CNGO publications (Summary of Activities and the Geoscience Data Series) also disseminate data. This collective data includes 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.



A kame forming at the edge of the Barnes Ice Cap, northern Baffin Island. *Courtesy of CNGO*

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### Website

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

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

## KITIKMEOT REGION

Covering over 440,000 square kilometres (km<sup>2</sup>), the Kitikmeot is the smallest of the three Nunavut regions encompassing most of the Canadian western Arctic including the western and northern portions of the Nunavut mainland, as well as the King William and Stefansson islands, the Boothia Peninsula, and portions of Victoria, Prince of Wales, and Somerset islands. The region is one of the least densely populated in the world with a density of less than 0.02 people/km<sup>2</sup> and a total population of 6,982 people (2017) living in five permanent communities. Cambridge Bay, located on the southern shore of Victoria Island, is the largest community in this region, with a population of 1,985 people. The region also includes the community of Kugluktuk on the mainland in the west, and Gjoa Haven, Kugaaruk, and Taloyoak in the eastern Kitikmeot. With no road connections between Kitikmeot communities, Yellowknife, the capital of the Northwest Territories, is the main logistical and supply centre for the region.

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. This region has been historically explored for gold, base metals, uranium, platinum group elements, and diamonds. Four past-producing mines are located in the Kitikmeot region: the Roberts Bay and Ida Bay silver mines are located in the Hope Bay area, south of the Coronation Gulf and Victoria Island, and the Lupin gold mine and Jericho diamond mine are located near the border with the Northwest Territories. The Kitikmeot's currently operating mine, Doris North gold mine, is located at the northern end of the Hope Bay greenstone belt, approximately 125 km southwest of Cambridge Bay. As of November 2018, 2.7 million hectares (ha) of mineral tenure was held in the Kitikmeot region, including 808,000 ha of mineral claims and 1.64 million ha of prospecting permits.



Camp at the Back River Marine Laydown Area. Courtesy of Sabina Gold and Silver Corp

TMAC Resources Inc. is one of the most active exploration and development companies in this region. Following the start-up of commercial production at the Doris North mine in 2017, the company focused on improving gold recoveries from its first processing plant and the installation of a second concentrator line, with ongoing drilling aimed at delineation of the BTD zone and infill drilling at Doris, as well as advancing the Madrid trend deposits in terms of exploration and permitting. TMAC received the project certificate for the Madrid and Boston project from the Nunavut Impact Review Board, which following the anticipated receipt of the Type A water licence in Q1 of 2019, will enable the company to proceed with establishing surface infrastructure for the Madrid North, Madrid South, and Boston deposits.

With a new investor on board, Sabina Gold and Silver Corp. continued development and exploration activities advancing its 100 per cent owned Back River project. In January, the company received its Type B water licence and in April, it finalized the Inuit Impact Benefit Agreement and the Long Term Land Tenure Agreement with the Kitikmeot Inuit Association. Construction of the marine laydown area at Bathurst Inlet was completed in August with three sealift shipments received. Sabina continued to drill-test new targets and this resulted in the discovery of gold mineralization at the Nuvuyak target, approximately 1,000 metres west from the Goose Main deposit.

Silver Range Resources Ltd. obtained three prospecting permits covering an area of known gold mineralization in a Witwatersrand-type quartz pebble conglomerate. The company launched a brief prospecting and sampling program, concentrating on an auriferous layer above the volcanic-sedimentary contact. Silver Range also substantially expanded its South Kitikmeot Gold project and announced that Amaroq Gold Corporation signed a letter of intent to purchase the project. The South Kitikmeot Gold project consists of seven separate properties underlain by rocks of the Archean Beechey Lake Group; these rocks also host the gold mineralization at Sabina Gold and Silver Corp.'s Goose and George projects, and at the past-producing Lupin gold mine.

Auryn Resources Inc. continued to focus its activities on its 100 per cent owned Committee Bay gold project located in the eastern Kitikmeot, approximately 180 km northeast of Agnico Eagle Mines Limited's Meadowbank gold mine. The summer exploration program consisted of 10,000 m of rotary air-blast and diamond drilling as well as till sampling. This work concentrated on three of the six targets delineated during previous exploration programs. Sixteen diamond drill holes were completed at the Aiviq prospect with all of the rotary air-blast drilling concentrating on the Kalulit and Aarluk prospects.

**LEGEND**

**Commodity (Number of Properties)**

Gold, Active (22)	Gold, Inactive (5)
Mine, Active (1)	Uranium, Inactive (1)
Base Metals, Inactive (2)	Mine, Inactive (2)
Diamonds, Inactive (3)	

**Areas with Surface and/or Subsurface Restrictions**

CPMA Caribou Protection Measures Apply
MBS Migratory Bird Sanctuary
NP National Park
NWA National Wildlife Area
TP Territorial Park
WP Wildlife Preserve
WS Wildlife Sanctuary

**Inuit Owned Lands (Fee simple title)**

Surface Only
Surface and Subsurface

**Geological Mapping Programs**

Canada-Nunavut Geoscience Office
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**Boundaries**

NLCA <sup>1</sup> Nunavut Settlement Area
Nunavut Regions
Provincial / Territorial

**Transportation Routes**

Yellowknife-Contwoyto Winter Road
Proposed Bathurst Inlet Port and Road
Proposed Grays Bay Road

<sup>1</sup>NLCA The Nunavut Land Claims Agreement



## KIVALLIQ REGION

The Kivalliq covers 445,109 km<sup>2</sup> and occupies the central region of Nunavut. Located along the west coast of Hudson Bay, the Kivalliq is bounded to the south by Manitoba and to the west by the Northwest Territories. Rankin Inlet, the regional hub, and Baker Lake, the territory's only inland community, are key gateways for exploration and mining in this region. The region also includes the coastal communities of Arviat, Whale Cove, Chesterfield Inlet, Coral Harbour, and Nauyasat.

Again in 2018, the Kivalliq saw exploration for both diamonds and gold, although gold remained the major focus. As of November 2018, mineral tenure in the region included 1,203 claims covering 1,084,955 ha, 31 prospecting permits covering 509,712 ha, and 165 mineral leases covering 118,396 ha.

The bedrock geology of the Kivalliq is characterized by Archean and Proterozoic plutonic rocks, major Paleoproterozoic sedimentary basins, and numerous greenstone and metasedimentary belts of the Rae and Hearne domains of the Western Churchill Province. Younger Paleozoic strata of the Hudson Bay Lowlands are found in the east on Southampton and Coats islands. The diverse geology of this region hosts a number of significant mineral occurrences and deposits, including historical and current resources in gold, uranium, diamonds, nickel, and platinum group and rare earth elements. The Kivalliq has a long history of mining, and hosted two of Canada's first mines north of 60° latitude: the North Rankin Nickel Mine, which operated from 1957 to 1962, and the Cullaton-Shear Lake gold mine, west of Arviat, which operated in the early 1980s.

Located approximately 80 km north of Baker Lake, Agnico Eagle Mines Limited's Meadowbank gold mine has produced nearly three million ounces of gold since it began production in 2010. Gold production at Meadowbank has slowed as the mine approaches its end of life, but work continues to bring the Amaruq gold deposit online in late 2019 to supply ore to the Meadowbank mill. Agnico Eagle received a Type A water licence for development of the Whale Tail pit at Amaruq in July 2018. Road expansion and other construction at the Whale Tail deposit at the Amaruq site is ongoing and is expected to be complete by early 2019, and further exploration drilling indicates that the deposit has potential for underground mining as well as the planned open pit.

Agnico Eagle also owns the Meliadine gold project, located 25 km north of Rankin Inlet. Production at Meliadine is projected to begin in the second half of 2019, with construction at the site at 89 per cent complete, slightly ahead of schedule, as of September 2018. Annual gold production is anticipated to reach 400,000 ounces by the second year, and the Meliadine mine is expected to produce 5.3 million ounces of gold over its 14 year lifespan.

Northquest Ltd., a subsidiary of Nord Gold SE, continued work at the Pistol Bay project near the community of Whale Cove and carried out detailed till sampling and an extensive re-logging program on historical core.

Dunnedin Ventures Inc. was active once again at its Kahuna diamond exploration project in 2018. The company completed till sampling across the main target area at Kahuna and discovered a new kimberlite, KH10-11.



Siksik on core boxes at Pistol Bay camp. Courtesy of CIRNAC



# Kitikmeot

# Kivalliq

# SOUTHAMPTON ISLAND

Cambridge Bay

Gjoa Haven

Taloyoak

Kugaaruk

Igloolik

Hall Beach

MELVILLE PENINSULA

Nauyasat

FOXE BASIN

Queen Maud Gulf MBS

Ukkusiksalik NP

Beverly CPMA

Amaruq Area A (M)

Meadow River

Meadowbank Mine Area B (M)

Greyhound

Area C (M)

St. Tropez

Baker Lake

Kiggavik

White Hills

Cone Hill

Gibson MacQuoid

Kahuna Gold

Angilak

Parker Lake

Fox Lake

Kuulu

Chesterfield Inlet

Kahuna Diamonds

Dubasant Lake

Peter Lake

Qamanirjuaq CPMA

Rankin Inlet

Meliadine

Yathkyo Lake

Quartzite

Pistol Bay

Whale Cove

Yandle Lake

Noomut

Arviat

McConnell River MBS

Hard Cash

Kiyuk

Nigel

Thlewiazia River

323

328

MANITOBA

Churchill

HUDSON BAY

BAIE D' HUDSON

**LEGEND**

**Commodity (Number of Properties)**

- Diamonds, Active (2)
- Gold, Active (19)
- Mine, Active (1)
- Gold, Inactive (3)
- Uranium, Inactive (3)

**Areas with Surface and/or Subsurface Restrictions**

- CPMA Caribou Protection Measures Apply
- MBS Migratory Bird Sanctuary
- NP National Park
- NWA National Wildlife Area
- TP Territorial Park
- WP Wildlife Preserve
- WS Wildlife Sanctuary

**Inuit Owned Lands (Fee simple title)**

- Surface Only
- Surface and Subsurface

**Geological Mapping Programs**

- Canada-Nunavut Geoscience Office

**Boundaries**

- NLCA<sup>1</sup> Nunavut Settlement Area
- Nunavut Regions
- NILCA<sup>2</sup> Nunavik Settlement Area
- Provincial / Territorial

**Transportation Routes**

- Meadowbank / Amaruq Road
- Meliadine Road
- Proposed Nunavut to Manitoba Road

<sup>1</sup>NLCA The Nunavut Land Claims Agreement  
<sup>2</sup>NILCA The Nunavik Inuit Land Claims Agreement



## QIKIQTANI REGION

The Qikiqtani region is the largest of Nunavut's three administrative districts at 1,040,418 km<sup>2</sup>, and is primarily comprised of the islands of the Canadian Arctic Archipelago, notably Baffin, Bathurst, Devon, Cornwallis, and Ellesmere. The region also includes the Belcher Islands in southeastern Hudson Bay and the northern portion of the Melville Peninsula.

The region is also the most populous of the three, with approximately 20,000 people. Iqaluit, the territorial capital located on southern Baffin Island, is a centre for supplies and support services for the region. The Qikiqtani also includes the communities of Arctic Bay, Cape Dorset, Clyde River, Kimmirut, Pangnirtung, Pond Inlet, and Qikiqtarjuaq on Baffin Island; Sanikiluaq on Flaherty Island, one of the Belcher Islands in Hudson Bay; Igloodik and Hall Beach on the Melville Peninsula; and Resolute and Grise Fiord in the High Arctic. Several of these communities, notably Pond Inlet, provide services, supplies, and workers to exploration and mining projects.

Archean and Proterozoic rocks of the Churchill Province and Paleozoic rocks of the Arctic Platform and Innuitian Belt underlie the region. A variety of mineral deposits and occurrences are found in the Qikiqtani, including iron, diamonds, gold, base metals, platinum group elements, and sapphires. The region includes two past-producing mines: the Nanisivik zinc-lead-silver mine near Arctic Bay on northern Baffin Island, and Polaris, a zinc-lead mine on Little Cornwallis Island. Both ceased production in 2002.



Testing magnetic susceptibility of float boulders, North Arrow Minerals' Mel project. *Courtesy of CIRNAC*

In 2018, companies were exploring the Qikiqtani for iron, diamonds, base metals, and gold. Mineral claims, prospecting permits, and mining leases covering a total of 1.74 million hectares were held in the region as of November 2018, down from 2.4 million hectares held in November 2017.

Baffinland Iron Mines Corporation's Mary River mine is located near Pond Inlet on northern Baffin Island and has been in production since 2014. In 2018, the company produced and shipped a record 5.1 million tonnes of iron ore from the Milne Inlet port to markets in Europe, the United Kingdom, Japan, and Taiwan. Although this amount exceeds the 4.2 million tonnes allowed to be shipped through Milne under the 'early revenue phase' amendment to Baffinland's project certificate, the company received a variance increasing this amount to a maximum to 6.0 million tonnes of ore per year for 2018 and 2019. Citing concerns about the economic viability of the project and with support from the Qikiqtani Inuit Association and Government of Nunavut, Baffinland was granted this variance as a temporary measure while the Phase 2 amendment to the company's project certificate is being considered by the Nunavut Impact Review Board. The Phase 2 amendment proposes to increase further the shipping limit from Milne Inlet to 12 million tonnes annually, and to construct a rail line from the mine site to allow for more efficient transportation of ore than by the existing tote road.

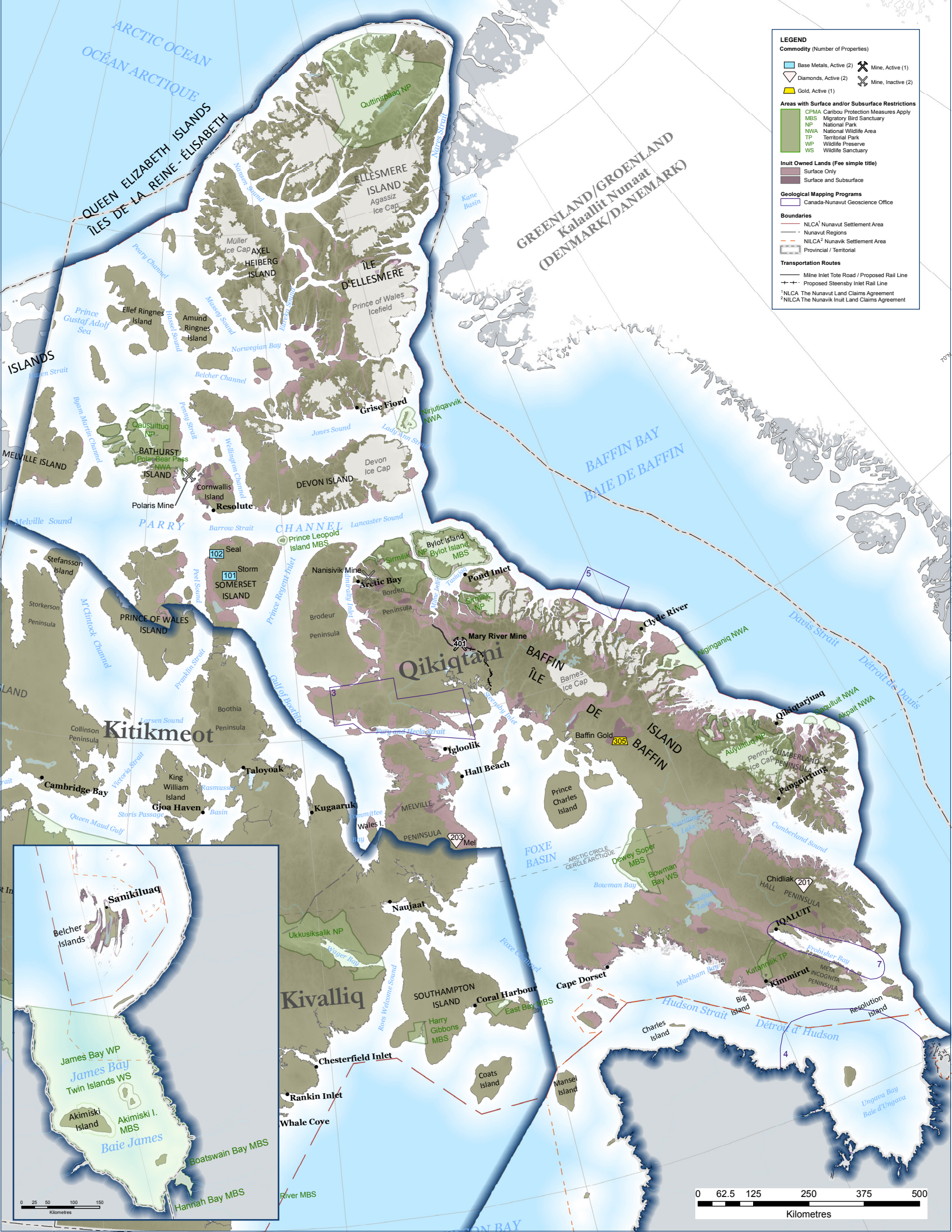
Peregrine Diamonds Ltd. filed an updated inferred resource in 2018 for the CH-6 kimberlite from its Chidliak diamond property that increased the contained carats by 58 per cent to 17.96 million. The company also released an updated preliminary economic assessment involving a 13-year open pit mining operation that would extract 16.7 million carats from the CH-6 and CH-7 kimberlites. De Beers Canada purchased Peregrine in September, and has indicated it is considering alternative mining technologies with smaller footprints at Chidliak.

North Arrow Minerals carried out till sampling and drilling at its Mel project on the Melville Peninsula. This work included drill-testing the ML-8 kimberlite discovered in 2017, and the discovery of a new kimberlite, ML-345, south of ML-8.

Aston Bay Holdings carried out a nine-hole drill program at its Storm Copper and Seal Zinc prospects on Somerset Island. This work resulted in the discovery of a new zinc-mineralized zone at Seal.

ValOre Metals, formerly Kivalliq Energy, fulfilled the terms of its option agreement with Commander Resources to gain 100 per cent ownership of the Baffin Gold project. The 2018 program included aeromagnetic surveys and rock and till sampling.





**LEGEND**

**Commodity (Number of Properties)**

- Base Metals, Active (2)
- Diamonds, Active (2)
- Gold, Active (1)
- Mine, Active (1)
- Mine, Inactive (2)

**Areas with Surface and/or Subsurface Restrictions**

- CPMA Caribou Protection Measures Apply
- MBS Migratory Bird Sanctuary
- NP National Park
- NWA National Wildlife Area
- TP Territorial Park
- WP Wildlife Preserve
- WS Wildlife Sanctuary

**Inuit Owned Lands (Fee simple title)**

- Surface Only
- Surface and Subsurface

**Geological Mapping Programs**

- Canada-Nunavut Geoscience Office

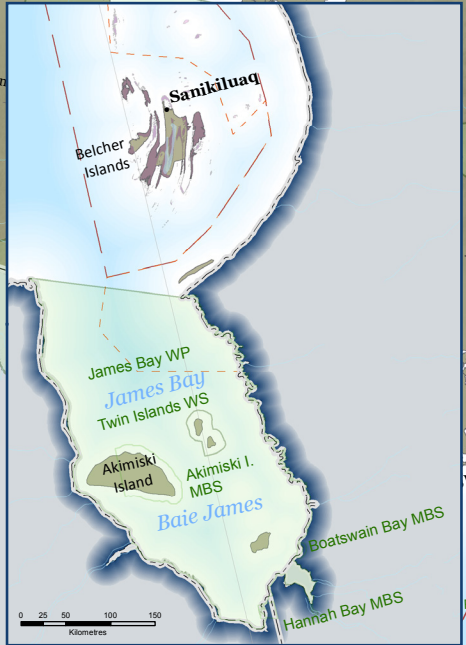
**Boundaries**

- NLCA<sup>1</sup> Nunavut Settlement Area
- Nunavut Regions
- NLCA<sup>2</sup> Nunavik Settlement Area
- Provincial / Territorial

**Transportation Routes**

- Mine Inlet Tote Road / Proposed Rail Line
- Proposed Steensby Inlet Rail Line

<sup>1</sup>NLCA The Nunavut Land Claims Agreement  
<sup>2</sup>NLCA The Nunavut Inuit Land Claims Agreement



### BASE METALS

101   102	Aston Bay (Storm <sup>1</sup> , Seal <sup>2</sup> )
Operator/Owner	Aston Bay Holdings Ltd.
Commodity	Copper <sup>1</sup> , Zinc <sup>2</sup> , Silver <sup>2</sup>
NTS	058B11 <sup>1</sup> , 058B14 <sup>1</sup> , 058B15 <sup>1</sup> , 058C02 <sup>1</sup> , 058C03 <sup>1</sup> , 058C06 <sup>1</sup> , 058C07 <sup>1</sup> , 058C10 <sup>1</sup> , 058C11 <sup>1,2</sup> , 058C13 <sup>2</sup> , 058C14 <sup>1,2</sup> , 058F04 <sup>2</sup>
Land Tenure	Crown <sup>1,2</sup> , Surface IOL <sup>1</sup>
Location	161 km south of Resolute <sup>1</sup> , 97 km south of Resolute <sup>2</sup>

The Aston Bay project, located on the northwest portion of Somerset Island, includes two prospects, Storm Copper and Seal Zinc, and covers an area of 414,537 hectares over 12 prospecting permits and 133 mineral claims. Copper mineralization at Storm is strata-bound and hosted in brecciated zones within dolomitic sediments of the Allen Bay formation, and consists of copper oxides (malachite, azurite, and chalcocite), bornite, and chalcopyrite. Zinc mineralization at Seal occurs as massive sphalerite and pyrite, found in permeable quartz-arenite strata interbedded with dolostone. Other prospects on the property include Blizzard, Tornado, Typhoon, Hurricane, and Squall.

Historical work at the Storm Copper prospect by previous operators includes over 9,000 metres (m) of diamond drilling, geological mapping, prospecting, and magnetic and electromagnetic geophysical surveys. In 2013, Aston Bay acquired data from this earlier work by Teck Resources Ltd., and collected a 200 kg mini-bulk sample for metallurgical analysis from the Seal Zinc prospect. In 2015, Aston Bay re-evaluated the existing geophysical and geological data and identified several high-priority targets for future geophysical work and eventual drill testing.

The 2016 field season consisted of 12 drill holes totaling 1,951 m on the Tornado and Hurricane prospects and other targets identified through previous geophysical work and structural analysis. The company conducted a two-week field program at Storm in July 2017 that included prospecting and camp maintenance in preparation for the 2018 drill program. A property-wide, 18,000 line-kilometre airborne gravity geophysical survey was flown in the fall of 2017, with results showing strong gravity responses at Storm, Seal, and Typhoon, and possible horst-graben structures in the southern part of the property that could provide favourable settings for base metal mineralization.

In December 2017, Aston Bay released an initial inferred resource for the Seal property of 1.01 million tonnes of ore at an average grade of 10.24% Zn and 46.5 grams of silver per tonne (g/t Ag). The resource has a cut-off of 4.0% Zn and is based on historical drill core from previous operators. The Seal prospect has been interpreted as a Mississippi Valley-type, zinc-silver deposit.

The 2018 field program included a total of 3,135 m of drilling over nine holes; seven targets were drilled at Storm Copper and two at Seal Zinc. Originally, the company had planned for 6,000 m of drilling but the program was impacted significantly by poor weather.

Highlights from the 2018 program at Storm include 1.5 m grading 4.39% Cu and 9.76 g/t Ag, and 2.0 m grading 2.54% Cu in hole AB18-09, a target selected based on electromagnetic data collected in 2017. At Seal, drilling led to the discovery of a new tidewater-adjacent zinc-mineralized zone, with intervals of 6.0 m grading 0.67% Zn and 2.0 m grading 1.11% Zn in moderately- to strongly-altered pseudo-breccias that are considered analogous to those found at Polaris.

The company plans to undertake a second drill program in 2019 and was able to bring in supplies via sealift in preparation for that program.



Helicopter over 2700 zone at Storm prospect, Aston Bay project. *Courtesy of CIRNAC*

## ACTIVE PROJECTS — DIAMONDS



### DIAMONDS

201	Chidliak
<b>Operator/Owner</b>	De Beers Canada Inc.
<b>Commodity</b>	Diamonds
<b>NTS</b>	026A04, 026A05, 026A12, 026B01, 026B02, 026B07 – 026B10, 026B15, 026B16
<b>Land Tenure</b>	Crown, Surface IOL
<b>Location</b>	121 km northeast of Iqaluit

The Chidliak project is located on the Hall Peninsula of Baffin Island, northeast of Iqaluit, and consists of 315,123 ha of mineral claims. The project and its parent company, Peregrine Diamonds Ltd., were acquired by De Beers Canada Inc. in September for \$107 million. Peregrine began exploring the property in 2005, and between 2008 and 2014 discovered 74 kimberlites at Chidliak, of which eight have sufficient tonnage and coarse diamond distribution to have economic potential.

All kimberlites at Chidliak are hosted in Archean orthogneisses and Archean to Paleoproterozoic supracrustal rocks of the Hall Peninsula block. Glacial till cover is found throughout the project area, typically 0 to 3 m thick, and locally up to 15 m thick. The kimberlites were emplaced between 157.0 and 139.1 million years ago (Ma) and occur as sheet-like dykes and pipe-like bodies. The pipe-like bodies are divided into kimberlites infilled with volcanoclastic material only and tend to be larger, and those infilled by a combination of volcanoclastic, pyroclastic, coherent, and apparent coherent kimberlite. This second division of kimberlites are more likely to have economic potential.

The focus of work on the property changed starting in 2013 from discovery of new kimberlites to proving up known ones. A bulk sample was collected from the CH-6 kimberlite that winter, and an initial inferred resource for it was filed in 2014. Another bulk sampling program was carried out at the CH-7 kimberlite in 2015, and in 2016 an updated inferred resource for CH-6, an initial inferred resource for CH-7, and a positive preliminary economic assessment (PEA) for the Chidliak Phase One project were all released. Additional drilling was carried out on in 2017 on CH-6 to delineate the resource to depth.

Although no field work was carried out in 2018, Peregrine filed a technical report updating the CH-6 inferred resource to 17.96 million carats in 7.46 million tonnes of kimberlite to 525 m below surface and re-releasing the CH-7 inferred resource estimating the kimberlite includes 4.23 million carats in 4.99 million tonnes to a depth of 240 m below surface. An updated PEA was released in July 2018. The report describes a plan to use open pit mining of the CH-6 and CH-7 kimberlites to extract 9.5 million tonnes of processing plant feed over a 13-year mine life to produce 16.7 million carats of diamonds for an average grade of 1.8 carats/tonne. Under the scenario envisioned in the PEA, an all-weather road would be constructed to provide access and allow transportation of supplies to the site from Iqaluit.

Since finalizing the purchase of Peregrine Diamonds, De Beers has indicated it has other plans for the property. Instead of using a road and conventional open pit mining, De Beers may use FutureSmart Mining technology being developed by its parent company, Anglo American. It is unclear what mining methods would be used, but the goal is to use innovative technologies and increased automation to result in a smaller mining and environmental footprint.

202	Kahuna Diamonds
<b>Operator/Owner</b>	Dunedin Ventures Inc.
<b>Commodity</b>	Diamonds
<b>NTS</b>	055J14, 055J15, 055O02 – 055O06
<b>Land Tenure</b>	Crown, Surface IOL
<b>Location</b>	31 km southwest of Chesterfield Inlet

The Kahuna project is located between Chesterfield Inlet and Rankin Inlet, and adjacent to Agnico Eagle's advanced Meliadine gold project. In late 2017, Solstice Gold was spun out of Dunedin to explore the gold potential on the Kahuna property (refer to Kahuna Gold project, p. 39). Under the plan of arrangement, Dunedin retained primary mineral title to 67 claims, holds a 50 per cent interest in another 12, and has secondary title to 66 claims held by Solstice Gold. The total area of the Kahuna project is 166,462 ha. Dunedin began exploring the property in 2014, building upon work carried out between 2001 and 2009 by the Shear Minerals Ltd.-Stornoway Diamond Corporation joint venture, which ultimately resulted in the discovery of the diamondiferous Kahuna, Notch, and PST kimberlites.

## ACTIVE PROJECTS — DIAMONDS

Situated in the northern Hearne Domain of the Churchill Province, the Kahuna project area is underlain by rocks of the Archean Rankin Inlet Group and Archean metaplutonic rocks of the Churchill Structural Province. The Rankin Inlet Group is overlain by the Proterozoic metasediments of the Hurwitz Group. At least 88 kimberlites have been identified on the property and occur as both pipes and dykes, subdivided into two types: type A kimberlites have strong magnetic signatures, fine grained magmatic textures, low indicator mineral counts, and were emplaced between 170 and 226 Ma. This type has low diamond potential. Type B kimberlites have medium to coarse-grained magmatic textures, have abundant indicator minerals, and emplacement ages of 233 to 239 Ma; these kimberlites are of significantly higher diamond potential, and are the focus of current exploration efforts.

An inferred resource estimate was released in 2015 for the Kahuna and Notch kimberlites based on bulk sampling and drilling conducted by Shear and Stornoway between 2006 and 2008. The resource estimates that these kimberlites contain 4.018 million carats of diamonds at an average grade of 1.01 carats per tonne from 3.99 million tonnes of kimberlite. Both kimberlites remain open at depth, and have potential for on-strike extensions. Six other kimberlites with high diamond potential are known on the property, but have not been defined sufficiently to be included in the mineral resource.

Early in 2018, Dunnedin announced that a new cluster of potentially diamondiferous kimberlites targets had been identified in the south-central portion of the property based on the results of the 2017 till sampling coincident with circular geophysical targets. In advance of drilling, ground magnetic and resistivity geophysical surveys were carried out over potential targets. Eleven rotary air-blast (RAB) drill holes totaling 801.6 m were completed during the spring program testing five targets. Five drill holes extended the known strike length of the 07KD-24 kimberlite dyke to 225 m, and another three drill holes extended the strike length of PST to 350 m. Approximately 400 kg of kimberlite was recovered from these holes and sent for diamond and indicator mineral recovery. The remaining three drill holes did not intersect kimberlite. Fewer targets than planned were tested during this program because of challenging weather that limited operators to targets close to Dunnedin's newly constructed camp.

During the summer program, 17 of 30 proposed targets were tested using a RAB drill, of which three intersected kimberlite. Twenty holes totaling 1,081 m were drilled of which two intersected historic kimberlite KD900, one intersected historic kimberlite KD230, and two intersected a new kimberlite discovery, KH10-11. More than 3.5 tonnes of kimberlite material was collected from these kimberlite pipes, of which approximately 1 tonne was prioritized for diamond

recovery. Eight hundred kilograms of glacial till were also collected from the drill holes near the bedrock interface so that portions could be processed for diamond indicator minerals to enhance existing till results and assist with future kimberlite targeting. In September, Dunnedin collected approximately 1,200 in-fill till samples within the Josephine Target Area, a 45 km<sup>2</sup> area with high quality diamond indicator minerals interpreted as being sourced from multiple undiscovered kimberlites. These samples are intended to assist with drill-targeting potential kimberlite pipe targets.

203	Mel
<b>Operator/Owner</b>	North Arrow Minerals Inc.
<b>Commodity</b>	Diamonds
<b>NTS</b>	046O08, 046O09, 046O10, 046P12
<b>Land Tenure</b>	Crown, Surface IOL
<b>Location</b>	136 km south of Hall Beach

North Arrow Minerals Inc.'s 100 per cent-owned Mel project, acquired by the company in 2013, consists of 56,075 ha of Crown and surface IOL tenure. The project is subject to a one per cent gross royalty on production payable to Anglo Celtic Exploration Ltd.

The original Mel targets were two kimberlite indicator mineral (KIM) trains with undefined sources. These trains included eclogitic and pyrope garnet, which may indicate the presence of diamonds in a kimberlite. Exploration began with an airborne magnetic survey, followed with till sampling and prospecting work in 2014 and 2015. Results from the 2015 sampling include anomalous KIM grain results, and follow-up sampling in 2016 include one sample with over 1,200 KIMs per 20 kg of till, suggesting proximity to a bedrock source.

In October 2017, North Arrow announced the discovery of the ML-8 diamondiferous kimberlite. A 62.1 dry kg composite sample of kimberlite float from ML-8 returned 23 diamonds larger than the 0.106 mm sieve size, including a single colourless diamond larger than 0.85 mm.

North Arrow's 2018 program at Mel resulted in the discovery via drilling of a new kimberlite, ML-345. The kimberlite is located south of ML-8, in an area where anomalously high KIM values, along with a northwest-trending weak magnetic high, had been identified in previous work. A total of 787.5 m of drilling was completed during the season, with drilling hampered due to weather conditions and logistical challenges. Three of the holes drilled at ML-8 intersected kimberlite; the kimberlite is over 170 m in strike length and the kimberlite core recovered shows similarities to the mineralogy found in the ML-8 surface subcrop. Drill holes 18-ML-05 and 18-ML-06, drilled at ML-345, also intersected kimberlite at 35.2 m and 25.8 m depth, respectively.

## ACTIVE PROJECTS — DIAMONDS

The company also completed a till sampling program over high-priority target areas identified from a surface potential map, collecting 447 till samples. The ML-8 subcrop yielded 225 kg of material for further microdiamond analysis.

The company released results from 129 kg of surface material sampled from ML-8 in November 2018. A total of 33 diamonds greater than the 0.106 mm sieve size was recovered, including one diamond greater than the 0.85 mm sieve size. Analytical results on the remaining 78 kg of ML-8 subcrop, the ML-8 and ML-345 kimberlite core, and the 447 till samples collected in 2018 have not yet been released.

204	Naujaat
Operator/Owner	North Arrow Minerals Inc.
Commodity	Diamonds
NTS	046K12, 046L09
Land Tenure	Crown
Location	8 km northeast of Naujaat

North Arrow Minerals Inc.'s Naujaat diamond project is located 7 km from tidewater and covers 10,472 ha of mineral claims and leases. Naujaat has a NI 43-101-compliant inferred resource of 26.1 million carats in 48.8 million tonnes of kimberlite from the Q1-4 kimberlite complex, which has a surface exposure of approximately 12.5 ha. North Arrow owns 100 per cent of the project; the company has conducted work on the property since 2014, after optioning the property from Stornoway Diamond Corporation. Eight kimberlite pipes have been discovered on the property to date.

North Arrow recovered a total of 383.55 carats of diamonds, valued at \$13,795 US, from the 1,353 dry tonne bulk sample collected from the Q1-4 kimberlite in 2014. Fifteen diamonds greater than 1 carat in size were recovered from the sample. The analysis identified two separate populations of diamonds, one made up of rare Type Ib diamonds that commonly occur in shades of orange and yellow.

No field work took place at Naujaat in 2015 and 2016. In 2017, North Arrow ran a \$2 million summer field program that included 3,469 m of drilling and the collection of a 209 dry tonne mini-bulk sample. Analytical results from the bulk sample were released in February 2018. A parcel of 1,991 diamonds greater than 0.85 mm, with a total weight of 64.25 carats, was recovered. These stones include diamonds in various hues and tones of yellow; these coloured diamonds make up 21.2% by weight of the total recovery. The three largest stones recovered from the sample are 5.25, 2.09, and 1.06 carats in size.

The 2017 bulk sampling process also exposed a contact between two distinct kimberlite phases. The company has defined one phase as the 'green kimberlite' unit, which is xenolith-poor, olivine-rich, and coherent; the other phase is their 'blue kimberlite' unit which is massive, poorly sorted, and volcanoclastic. Most of the yellow diamonds recovered to date are found in the 'blue kimberlite' material. The Q1-4 complex remains open at depth, with kimberlite known to be present to a depth of 305 m.

North Arrow planned an update to the NI 43-101 resource statement and geological model from 2013 that would integrate data from the 2017 drill program, but this has not been released to date. No work was reported from the property in 2018.



Pyrope garnet with olivine crystal within and teardrop ilmenite in core from the ML-345 kimberlite, Mel project.  
Courtesy of North Arrow Minerals Inc

**GOLD**

<b>301 302</b>	<b>Amaruq<sup>1</sup>, Meadow River<sup>2</sup></b>
<b>Operator/Owner</b>	Agnico Eagle Mines Limited
<b>Commodity</b>	Gold
<b>NTS</b>	066H01 <sup>2</sup> – 066H03 <sup>2</sup> , 066H06 <sup>1,2</sup> , 066H07 <sup>1,2</sup> , 066H08 <sup>1,2</sup> , 066H09 <sup>1</sup> , 066H10 <sup>1</sup>
<b>Land Tenure</b>	Crown <sup>2</sup> , Subsurface IOL <sup>1</sup>
<b>Location</b>	124 km north of Baker Lake <sup>1</sup> , 109 km north of Baker Lake <sup>2</sup>

The Amaruq project, located 50 km northwest of Agnico Eagle Mines Limited's Meadowbank gold mine, was acquired in 2013. The property covers 116,717 hectares (ha) of the Amaruq and Meadow River claim blocks, which includes Crown mineral tenure and a Mineral Exploration Agreement (MEA) on IOL. The property is connected to the Meadowbank mine-site via a 64 km all-weather road. Agnico Eagle signed an Inuit Impact Benefit Agreement (IIBA) for the project with the Kivalliq Inuit Association in June 2017; this IIBA addresses employment, training, business opportunities, and protection of Inuit culture and values.

There are nine mineralized zones known to date at Amaruq – Whale Tail, Whale Tail North, I, V, R, Mammoth 1 and 2, Buffalo, and Tugak. Gold mineralization in these zones is found in quartz-pyrite-arsenopyrite veining in volcano-sedimentary rocks, similar to the Goose and Portage deposits at Meadowbank. Mineralization occurs predominantly as two styles: silica flooding with significant pyrrhotite and arsenopyrite in veinlets or as disseminated grains in chert bands, and up to one metre-thick, gold-bearing quartz-sulphide veins cutting the main foliation in all rock sequences. The quartz-sulphide veins appear better developed in the mafic to ultramafic volcanic rocks and fold hinge zones. In both styles, gold is associated with pyrrhotite and/or arsenopyrite, occurring as micron-sized inclusions or as free gold in quartz-rich gangue. The mineralized zones strike east-northeast to northeast and dip to the southeast, with Whale Tail, the largest deposit, having a strike length of 2.3 km and a known depth of 915 m; Whale Tail remains open at depth and along strike.

After receiving its Type B water licence for Amaruq in 2016, Agnico Eagle received approval for its Type A water licence for operations at Amaruq, including Whale Tail, from the Minister of Crown-Indigenous Relations and Northern Affairs Canada in July 2018. The Amaruq deposit, including the Whale Tail pit, has an initial reserve of 2.4 million ounces of gold for its open pit operations. Additional resource

estimates include 1.0 million ounces in indicated resources for open pit and underground operations, and an inferred resource for the same of 1.7 million ounces. Open pit mining is expected to begin in Q2 2019, with the first ore being produced in Q3 2019 at a planned processing rate of 9,000 tonnes per day. Maximum gold production from Amaruq in 2019 is estimated at 190,000 oz and in 2020 at 270,000 oz. Due to differences in gold mineralization at Amaruq as compared to Meadowbank, some modifications to the mill are required, including the addition of a continuous gravity and regrind circuit. Construction of a permanent camp on site has also been completed. For the nine-month period ending in September 2018, capital expenditures at Amaruq reached \$120.9 million, with expenditures on the underground ramp considered separately and totaling \$8.7 million.

Exploration work continued at Amaruq in 2018, with 29,702 m of core drilled over 90 drill holes on the project, totalling slightly under half of the planned 67,000 m of drilling planned across Agnico Eagle's properties in the region. Highlights from the drilling include 14.2 grams of gold per tonne (g/t Au) over 5.1 metres at 698 m depth from Whale Tail, 19.5 g/t Au over 7.0 m at 477 m depth at Whale Tail North, and 19.6 g/t Au over 5.6 m at 656 m depth at V Zone, which expands that zone westward. Exploration work at the adjacent Meadow River property in 2017 included an extensive exploration campaign comprising prospecting, the collection of over 900 till samples, and nearly 400 km of ground magnetic geophysical surveying. No work on this property was reported in 2018 and results have not been released.

<b>303 304</b>	<b>Back River (George Lake<sup>1</sup>, Goose Lake<sup>2</sup>)</b>
<b>Operator/Owner</b>	Sabina Gold and Silver Corp.
<b>Commodity</b>	Gold
<b>NTS</b>	076G09 <sup>2</sup> , 076G10 <sup>2</sup> , 076G13 <sup>1</sup> , 076G14 <sup>1</sup> , 076J03 <sup>1</sup> , 076J04 <sup>1</sup>
<b>Land Tenure</b>	Crown, Surface IOL
<b>Location</b>	362 km southwest of Cambridge Bay <sup>1</sup> , 391 km south of Cambridge Bay <sup>2</sup>

Sabina Gold and Silver continued exploration and development activities at its Back River project acquired in late 2009. The project area – located approximately 75 km southwest of Bathurst Inlet and covering an area of almost 50,000 ha with a length of 80 km – consists of seven properties, of which two, Goose and George, have been worked on in recent years. All of the 2018 exploration activities were focused on the Goose property.



Barges unloading at the Marine Laydown Area, Back River project. Courtesy of Sabina Gold and Silver Corp

The Back River property is located in the central part of the Slave Structural Province and is underlain by sedimentary rocks of the Beechey Lake Group consisting of oxide and silicate iron formations hosted in turbidites and in less abundant greywackes and mudstones. The sequence is cut by gabbroic and felsic dykes, with the latter ranging in thickness from 0.5 to 5 metres. The bulk of gold mineralization found within the deposits of the Goose property is structurally controlled and is associated with quartz and quartz-carbonate veining, silicification, and shearing within the iron formation and the interbedded sediments. Mineralization consists of pyrite, arsenopyrite, and pyrrhotite with free gold found in quartz and quartz-carbonate veining. Gold mineralization is also found in porphyritic quartz and quartz-feldspar dykes, but not in the gabbro dykes which post-date the gold mineralization. Mineralization at the George deposit, located 50 km northwest of Goose, is predominantly hosted within the oxide iron formation at the base of the unit with minor mineralization hosted within the silicate iron formation.

Current measured and indicated resource estimates for the Goose property total 5.33 million ounces of gold at an average grade of 5.87 g/t Au, with an inferred resource of 1.85 million ounces of gold grading 7.43 g/t. The above estimates include only the Umwelt, Llama, and Goose Main deposits. The George property contains an indicated resource of 1.1 million ounces of gold grading 5.6 g/t, and an inferred resource of 980,000 ounces of gold at 6.32 g/t.

Sabina has been steadily advancing the project through the regulatory processes since 2009. Following NIRB's 2017 decision to recommend continuation of the development of the project, activities have increased significantly. In

January 2018, Sabina finalized a \$66 million investment by Zhaojin Mining Industry Co Ltd, representing about 9.9 per cent of Sabina's issued and outstanding common shares, and obtained a Type B Water Licence required for completion of pre-construction infrastructure work. In April 2018, Sabina finalized the IIBA and the Long Term Land Tenure Agreement with the Kitikmeot Inuit Association. These agreements, in addition to outlining benefits to Inuit, included shares in Sabina and a 1 per cent net smelter return. Sabina completed the marine laydown area and landing on Bathurst Inlet with the first shipment received in mid-August and two additional sealifts completed prior to the end of shipping season. Supplies will be transported to the Goose property via winter road. In November, the company announced it had received positive Ministerial recommendation for its Type A Water Licence; this will allow Sabina to commence activities, including mine construction, on site. The licence allows for the development of the Umwelt, Llama, and Goose Main open pits as well as underground workings at Umwelt.

With \$83 million budgeted for development and exploration in 2018, Sabina planned an aggressive, 25,000 metre diamond drilling program designed to follow up on the 2017 drilling campaign and to test other promising targets. In addition to drilling, geological mapping, a till geochemical survey, and geochronology work were done on selected areas of the property. The spring drilling campaign – consisting of 6,000 metres of drilling in 10 holes – targeted areas in the vicinity of the existing mineral resource and stand-alone targets located outside of the resource. Some of the highlights of this drilling program include high-grade intercepts of 23.25 m grading 15.67 g/t Au further expanding Llama Extension, as well as discovery of a new mineralized

## ACTIVE PROJECTS — GOLD

zone, Nuvuyak Target, which could represent an extension of the Goose Main deposit. The newly discovered target is located approximately 850 metres along strike to the west and 1,000 metres down plunge of the Goose Main deposit. With intercepts of up to 39.5 metres grading 11.58 g/t Au and 16.39 g/t Au over 13.2 metres, and additional significant gold mineralization possibly representing the previously encountered Hook zone above the Nuvuyak Target, Sabina believes that the new discovery could potentially be linked to the Goose Main deposit.

<b>305</b>	Baffin Gold
<b>Operator/Owner</b>	ValOre Metals Corp.
<b>Commodity</b>	Gold
<b>NTS</b>	027B05, 027B06, 027B11 – 027B14, 037A06 – 037A10
<b>Land Tenure</b>	Crown, Subsurface IOL, Surface IOL
<b>Location</b>	252 km south of Clyde River

The Baffin Gold property is located in central Baffin Island covering 160 km of the Proterozoic Foxe Fold Belt. Mineral tenure on the property includes prospecting permits, mineral claims, and Mineral Exploration Agreements on subsurface Inuit Owned Land, with a combined total area of 408,982 ha. Prior to 2000, exploration focused on Black Angel-type lead-zinc mineralization, before BHP Billiton and Falconbridge discovered gold mineralization in 2001. Commander Resources optioned the property in 2003 and conducted exploration through 2011, identifying multiple gold-bearing prospects. No work was carried out from 2012 through 2016.

In March 2018, Kivalliq Energy Corporation issued 250,000 shares to Commander Resources Ltd. to gain 100 per unit ownership of the project under the companies' 2017 option agreement. In June, Kivalliq Energy changed its name to ValOre Metals and undertook a 10 to one share consolidation.

Gold mineralization on the property is known to occur in multiple settings, including within silicate and sulphide-facies iron formation and in quartz veins hosted in granodiorite, metavolcanic, and metasedimentary rocks of the Bravo Lake Formation.

In 2017, Kivalliq Energy collected grab, channel, and till samples and used a drone to collect high resolution imagery of target areas. In the summer of 2018, 7,038 line-km of aeromagnetic surveys were flown over the property to in-fill and extend existing geophysical grids. The company also collected 438 till and 31 rock geochemical samples to expand anomalous trends from the 2017 results and verify historic gold-in-till values. No results from this program have been reported.

<b>306, 307, 308, 309, 310</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>	046M12 <sup>3</sup> , 056F135, 056J10 <sup>4</sup> , 056J11 <sup>4</sup> , 056J12 <sup>1,4</sup> , 056J13 <sup>1,4</sup> , 056J14 <sup>4</sup> – 056J16 <sup>4</sup> , 056K02 <sup>5</sup> – 056K04 <sup>5</sup> , 056K05 <sup>2</sup> , 056K06 <sup>2,5</sup> , 056K07 <sup>1,2,5</sup> , 056K08 <sup>1</sup> , 056K09 <sup>1</sup> , 056K10 <sup>1,2</sup> , 056K11 <sup>2</sup> , 056K12 <sup>2</sup> , 056K16 <sup>1</sup> , 056O01 <sup>3,4</sup> , 056P03 – 056P10 <sup>3</sup>
<b>Land Tenure</b>	Crown <sup>1-5</sup> , Surface IOL <sup>1,3,4</sup> , Subsurface IOL <sup>3</sup>
<b>Location</b>	246 km southwest of Kugaaruk <sup>1</sup> , 255 km southwest of Kugaaruk <sup>2</sup> , 132 km south of Kugaaruk <sup>3</sup> , 213 km south of Kugaaruk <sup>4</sup> , 286 km southwest of Kugaaruk <sup>5</sup>

Auryn Resources Inc. continued to focus its activities in Nunavut on its 100 per cent owned Committee Bay gold project located in the eastern Kitikmeot region, approximately 180 km northeast of Agnico Eagle Mines Limited's Meadowbank gold mine. The project is located within the Rae Domain of the Western Churchill Province, along the Committee Bay greenstone belt, a northeast-southwest trending belt between 5 and 50 km in width that can be traced over 300 km. The area is extensively covered by a thick sequence of tills and is characterized by poor to absent exposure of underlying bedrock. Basalts, intermediate to felsic tuffs, komatiites, coarse-grained metasedimentary rocks, and iron formations dominate the stratigraphy. Gold mineralization in the Committee Bay belt is commonly associated with quartz veining, silicification, and sulphidization within silicate, oxide and/or sulphide facies iron formation of the volcano-sedimentary Archean Prince Albert Group. Gold mineralization has also been found in quartz veins hosted in shear zones within sedimentary and volcanic rocks and is generally associated with arsenopyrite, pyrite, and pyrrhotite. The Committee Bay belt, mapped in the early 1960s by the Geological Society of Canada, has been later explored for base metals, uranium and gold. The Three Bluffs deposit, discovered in 2003 and located in the central part of the property, contains a NI 43-101-compliant indicated mineral resource of 524,000 oz gold at 7.85 g/t and an inferred resource of 720,000 oz gold at 7.64 g/t.



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The 2018 drill program was initially designed to follow up on six of the targets delineated by the 2017 high resolution till survey. A total of 10,000 metres of rotary air-blast (RAB) and diamond drilling was budgeted for the Aiviq, Kalulik, Aarluk, Tulugaq, Castle Pebble, and Koffy prospects. Of these, only the first three were drilled, with almost 5,000 metres of diamond drilling done on Aiviq target and 22 RAB holes totalling 4,135 metres drilled at the Kalulik and Aarluk prospects. Boulders down-ice from Aiviq and Kalulik targets were also sampled.

Diamond drilling at the Aiviq prospect consisted of 16 drill holes, all of which intersected gold mineralization associated with a 20 to 40 metre wide zone of intense quartz veining and sulphide mineralization. The best intercept at Aiviq assayed 1.54 g/t Au over 13.5 metres, including an interval of 6.0 metres of 3.3 g/t Au. The company believes that intercepts of the altered and veined gold-bearing structure stretching 1.5 km along strike represent a major hydrothermal system, possibly extending to the Kalulik prospect. Boulder sampling down-ice from this prospect resulted in assays of up to 26.3 ppm Au. Boulders were also sampled down-ice from Kalulik prospect with a highest assay of 12.0 g/t Au reported. RAB drilling at Kalulik and Aarluk prospects intersected 21.34 metres grading 0.4 g/t Au at Kalulik and 3.39 g/t Au over 3.05 metres at Aarluk.

311 312 313	Committee Bay (Area A <sup>1</sup> , Area B <sup>2</sup> , Area C <sup>3</sup> )
Operator/Owner	Western Atlas Resources Inc.
Commodity	Gold
NTS	056K02 <sup>3</sup> , 056K03 <sup>3</sup> , 056K06 <sup>2</sup> , 056K07 <sup>2</sup> , 056K09 <sup>1</sup> , 056K10 <sup>1,2</sup> , 056K11 <sup>2</sup>
Land Tenure	Crown
Location	224 km southwest of Kugaaruk <sup>1</sup> , 255 km southwest of Kugaaruk <sup>2</sup> , 297 km southwest of Kugaaruk <sup>3</sup>

Western Atlas Mining is a relative newcomer to Nunavut, entering the territorial exploration scene in 2017 by staking over 1,700 km<sup>2</sup> in mineral claims in the Kivalliq region in the vicinity of the Meadowbank Mine and around Auryn's Committee Bay project in the eastern Kitikmeot region.

Western Atlas' Committee Bay project consists of 114,355 ha in 95 mineral claims grouped into three non-contiguous blocks to the east and south of Auryn Resources' Three Bluffs deposit. These blocks cover areas mapped as intrusive rocks, and areas known to contain rocks of the Prince Albert Group. This group of rocks hosts the bulk of precious and base metal

occurrences in the Committee Bay greenstone belt, and the belt itself has been the target of past exploration programs since the early 1970s.

Following the staking of the Committee Bay properties, Western Atlas contracted RPA Inc. to research and compile results of historical exploration activities in the project area. The resulting NI 43-101-compliant technical report was released in September 2017 and will form the basis for future exploration activities for Western Atlas in this region. According to the report, the company's current land package covers one showing discovered by the GSC in the 1970s and described as a tholeiite-komatiite-hosted copper showing and the Ibx gold showing that contains auriferous, sulphidic, arsenopyrite-bearing quartz veins historically sampled with grab samples assaying at up to 18.11 g/t Au.

No exploration activities on the Committee Bay project were reported by Western Atlas in 2018.



Helicopter after dropoff. Courtesy of CIRNAC

## ACTIVE PROJECTS — GOLD

<b>314</b> <b>315</b> <b>316</b> <b>317</b>	Cone Hill <sup>1</sup> , Fox Lake <sup>2</sup> , Parker Lake <sup>3</sup> , Peter Lake <sup>4</sup>
<b>Operator/Owner</b>	Agnico Eagle Mines Limited
<b>Commodity</b>	Gold
<b>NTS</b>	055M08 <sup>3</sup> – 055M10 <sup>3</sup> , 055N02 <sup>4</sup> , 055N03 <sup>2,4</sup> , 055N04 <sup>2,4</sup> , 055N05 <sup>3</sup> , 055N06 <sup>2</sup> , 055N07 <sup>2</sup> , 055N12 <sup>3</sup> , 055N13 <sup>1</sup> , 055M16 <sup>1</sup>
<b>Land Tenure</b>	Crown <sup>1,2,4</sup> , Surface IOL <sup>2,3</sup>
<b>Location</b>	161 km northwest of Rankin Inlet <sup>1</sup> , 78 km northwest of Rankin Inlet <sup>2</sup> , 135 km northwest of Rankin Inlet <sup>3</sup> , 62 km northwest of Rankin Inlet <sup>4</sup>

Agnico Eagle Mines Limited is the 100 per cent owner of several gold exploration properties between the company's Meliadine gold project and Meadowbank gold mine. The major properties include Cone Hill, Parker Lake, Fox Lake, and Peter Lake, covering approximately 5,000 ha, 38,500 ha, 29,200 ha, and 29,450 ha, respectively. The properties are on Crown land and IOL, and are located along the western extent of the Pyke Fault in the Rankin Inlet greenstone belt west of Meliadine to areas southwest of the community of Baker Lake in the Gibson-MacQuoid greenstone belt. These properties are underlain by geological units similar to those found at the Meadowbank mine site, and the Meliadine, and Amaruk properties, all associated with greenstone belts and regional-scale structures. Historical assays returned over 40 g/t Au from grab samples taken from arsenopyrite-bearing quartz veins in iron formation at the Amarok showing of the Fox Lake property.

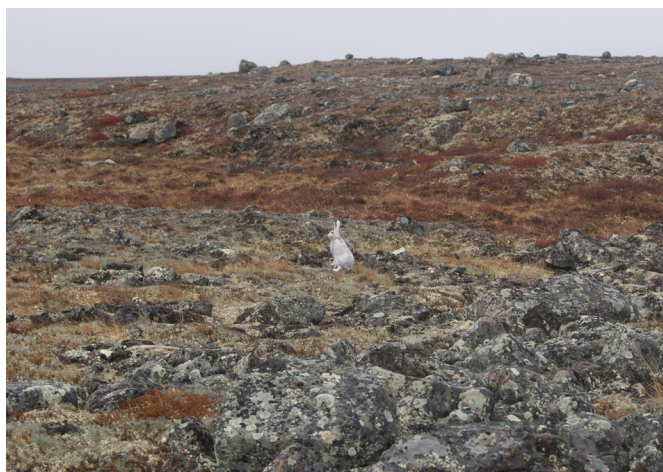
Agnico Eagle conducted various exploration campaigns at these properties in 2017. At Cone Hill, intensive work was conducted including a magnetic survey, grab and till sampling, and 1,814 m of diamond drilling over 14 holes. Approximately 80 km to the south, at the Parker Lake property, exploration work included prospecting, grab and till sampling, and 1,317 m of diamond drilling in 14 holes. At Fox Lake, a two-day prospecting survey was conducted in August 2017. The company planned follow-up work on the properties in 2018, including additional prospecting and geophysical surveys at Fox Lake, and spring programs including 10 drill holes, regional mapping, geophysical surveys, and prospecting at both Parker Lake and Cone Hill. No results have been released.

<b>318</b>	Contwoyto Gold
<b>Operator/Owner</b>	Benchmark Metals Inc.
<b>Commodity</b>	Gold
<b>NTS</b>	076E10, 076E11
<b>Land Tenure</b>	Crown, Surface IOL
<b>Location</b>	292 km south of Kugluktuk

Crystal Exploration Inc. purchased the Contwoyto Gold project from North Arrow Minerals in 2017, consisting of two claims and two mineral leases, one of which is grandfathered on subsurface IOL. The property is located south and southeast of the past-producing Lupin gold mine, and includes several gold occurrences. Results from a 2017 winter drill program on the Butterfly prospect were released in January 2018, following which two new claims totaling 2,184 ha were added west of the company's Fin 4 claim and the adjacent mineral lease. In May 2018, Crystal announced a share consolidation and name change to Benchmark Metals Inc.

The short drill program of 2017 was hampered by poor weather and included three diamond drill holes totaling 198 m of BTW-size diamond drilling. All of the drill holes intersected mineralized iron formation within 50 metres of the surface. Some of the highlights include intercepts of 4.0 metres grading 14.43 g/t Au, 6.83 g/t Au over 5.0 m, and 2.19 g/t Au over 9.0 metres. Results from a planned, larger 2018 drill program have not been announced.

Plans are reportedly underway for a 2019 exploration program but no details have been released as the company is currently focusing its efforts on gold exploration properties in BC.



Arctic hare coming into its winter coat, Amaruk project.  
Courtesy of CIRNAC

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319	Elu Belt
Operator/Owner	TMAC Resources Inc.
Commodity	Gold, Silver, Zinc, Copper
NTS	076O09, 076O16, 076P13, 077A02, 077A07, 077A10
Land Tenure	Crown, Surface IOL
Location	116 km southwest of Cambridge Bay

The 685 km<sup>2</sup> TMAC's land package covering the Elu greenstone belt, located approximately 30 km northeast of the Hope Bay belt, was acquired from Newmont Mining Corporation as a part of the agreement signed in 2013. The Elu belt, covering an area roughly 10 by 80 kilometres, shows similarities to the Hope Bay belt with which it is possibly linked in the southern tip by a concave structure sharing the same supracrustal rock sequence. Both belts are of a similar age and are composed of bimodal volcanic rocks intercalated with sediments, with the Elu belt containing a higher percentage of metasedimentary rocks. This belt is overlain by sedimentary rock sequences ranging in age from Paleoproterozoic to Paleozoic and cut by Neoproterozoic mafic intrusions. It is transected by a major north-south trending shear zone with strong carbonate alteration. The

Elu belt contains known base metal and gold occurrences with the adjacent mafic-plutonic complex to the southwest possibly prospective for platinum group elements.

The bulk of exploration activities along the Elu belt took place in the 1970s and 80s, with minor work done by Miramar Mining Corporation in 2001. A small mapping project conducted by the Geological Survey of Canada and Canada-Nunavut Geoscience Office in 2014 and 2015 concentrated on the Proterozoic metasedimentary sequences.

During the 2015 and 2016 seasons, TMAC conducted two airborne geophysical surveys over the Elu belt. An airborne gravity survey utilizing the Sander Airgrav™ system was completed in the 2015 exploration season, while an airborne magnetic and electromagnetic survey begun in 2015 was completed in the spring of 2016 for logistical reasons. In 2016, TMAC staked additional claims which linked the Elu claim block to its Hope Bay block. This newly staked block, termed the "Elu Link", was the subject of a 2,617-line kilometre magnetic-electromagnetic airborne survey conducted by TMAC in the second quarter of 2018. The results of this survey, flown on 150 metre line-spacing to support detailed geological interpretation and future target selection, have not been released.



Helicopter at rest in the sunset. *Courtesy of North Arrow Minerals Inc*

## ACTIVE PROJECTS — GOLD

<b>320</b>	Gibson MacQuoid
<b>Operator/Owner</b>	Auryn Resources Inc.
<b>Commodity</b>	Gold
<b>NTS</b>	055M06 – 055M09, 055M16, 055N05 – 0055N07, 055N10 – 0055N13, 056C04, 056D01
<b>Land Tenure</b>	Crown, Surface IOL
<b>Location</b>	118 km southeast of Baker Lake

In 2017, Auryn Resources Inc. acquired 19 prospecting permits and 57 mineral claims in three blocks that collectively cover an area of 375,000 ha and extend over 120 km of strike-length of the Gibson MacQuoid greenstone belt. This Archean-aged greenstone belt lies northwest of Agnico Eagle Mines Limited's Meliadine gold project and the community of Rankin Inlet. This is an early-stage exploration property where Comaplex Minerals Corp. conducted reconnaissance exploration and prospecting between 1989 and 1993. These programs resulted in the discovery of two gold showings.

In 2017, Auryn conducted a belt-wide till survey from which eight high priority gold-in-till anomalies were delineated. These anomalies are to be the focus of future exploration programs. In 2018, Auryn completed another summer exploration program that consisted of approximately 3,000 tightly spaced glacial till samples and 193 boulder and outcrop rock samples. The aim of this program was to provide high resolution coverage in proximity to the eight new anomalies. The company anticipates release of exploration program results in Q4 of 2018.

<b>321, 322</b>	Greyhound <sup>1</sup> , White Hills <sup>2</sup>
<b>Operator/Partner</b>	Agnico Eagle Mines Limited <sup>1,2</sup> , Aura Silver Resources Inc. <sup>1</sup>
<b>Commodity</b>	Gold <sup>1,2</sup> , Silver <sup>1</sup> , Zinc <sup>1</sup> , Copper <sup>1</sup> , Lead <sup>1</sup>
<b>NTS</b>	056D12 <sup>1,2</sup> , 056D13 <sup>1</sup> , 066A09 <sup>1,2</sup> , 066A10 <sup>2</sup>
<b>Land Tenure</b>	Crown <sup>1,2</sup> , Surface IOL <sup>2</sup>
<b>Location</b>	40 km north of Baker Lake <sup>1</sup> , 36 km northwest of Baker Lake <sup>2</sup>

The Greyhound precious and base metal project consists of 22 claims covering an area of 21,749 ha on Crown land in two separate parcels. The smaller parcel covers 6,072 ha in seven claims and is 100 per cent owned by Aura Silver. Located to the southwest, the larger property comprises 15 claims totalling 15,676 ha and is subject to an option

agreement, signed in June 2014, between Aura Silver and Agnico Eagle Mines Limited. Agnico Eagle completed phase one of the agreement in 2017 to earn a 51 per cent interest in the southwestern parcel of the Greyhound project. Agnico Eagle can increase its ownership to 70 per cent with the completion of a preliminary economic assessment or by spending \$5 million in additional exploration. The optioned claims about the White Hills property, a 17,211 ha parcel which is 100 per cent operated by Agnico Eagle. The Greyhound and White Hills properties straddle the all-season road between Baker Lake and the Meadowbank gold mine, 35 km to the north.

Like many of the projects in this part of the Kivalliq region, these properties are underlain by the Neoproterozoic Woodburn Lake Group, consisting primarily of a northeast trending middle- to upper-greenschist grade sequence of mafic to felsic volcanic rocks, greywacke, oxide iron formation, and quartzite. Locally at Greyhound, the focus is on the margins between a felsic sub-volcanic intrusion and the mafic meta-volcanic rocks of a greenstone belt. High-grade silver and anomalous gold and silver occurrences were discovered in 2011 at Aura Lake, which is adjacent to the Meadowbank all-season road. Current work at the property is focused on two principal gold targets: a strongly silicified zone, interpreted as a thrust fault, extending approximately 9 km along the western margin of the greenstone belt to the northwest of Aura Lake, and a banded iron formation, southwest of the lake, that caps the greenstone belt and has a known strike length of about 10 km.

The Dingo gold-copper prospect, approximately 12 km to the northeast, is a gossanous copper-rich stringer zone located adjacent to a gold-bearing linear quartz vein that can be traced for over 1.7 km. The White Hills property hosts several gold prospects including Ayak, Muskox Head, Jaeger, and Sam 25 Vein. At Ayak, gold mineralization occurs primarily in pyritic cherty iron formation in the mafic volcanic rocks and in quartz veins at the mafic volcanic rock unit contacts. Mineralization in the other three prospects is hosted in deformed, multi-stage shears and quartz-carbonate veins.

The 2017 program at Greyhound was planned to confirm previous drilling and geophysical results. A total of 2,262 m of diamond drilling took place over 10 holes and returned assay results of up to 3.3 g/t Au over 3.0 m at a depth of 94 to 97 m. In combination with previous work, this drilling indicates that mineralization is continuous across the target area.

A prospecting survey included the collection of 70 grab samples for assay. Samples from the Dingo Zone returned gold grades ranging from 1.2 g/t up to 126.0 g/t and silver grades from 96.6 g/t to 356 g/t along the quartz vein.



Aerial view directly overhead the Doris camp and mine infrastructure, TMAC's Hope Bay mine. Courtesy of TMAC Resources Inc

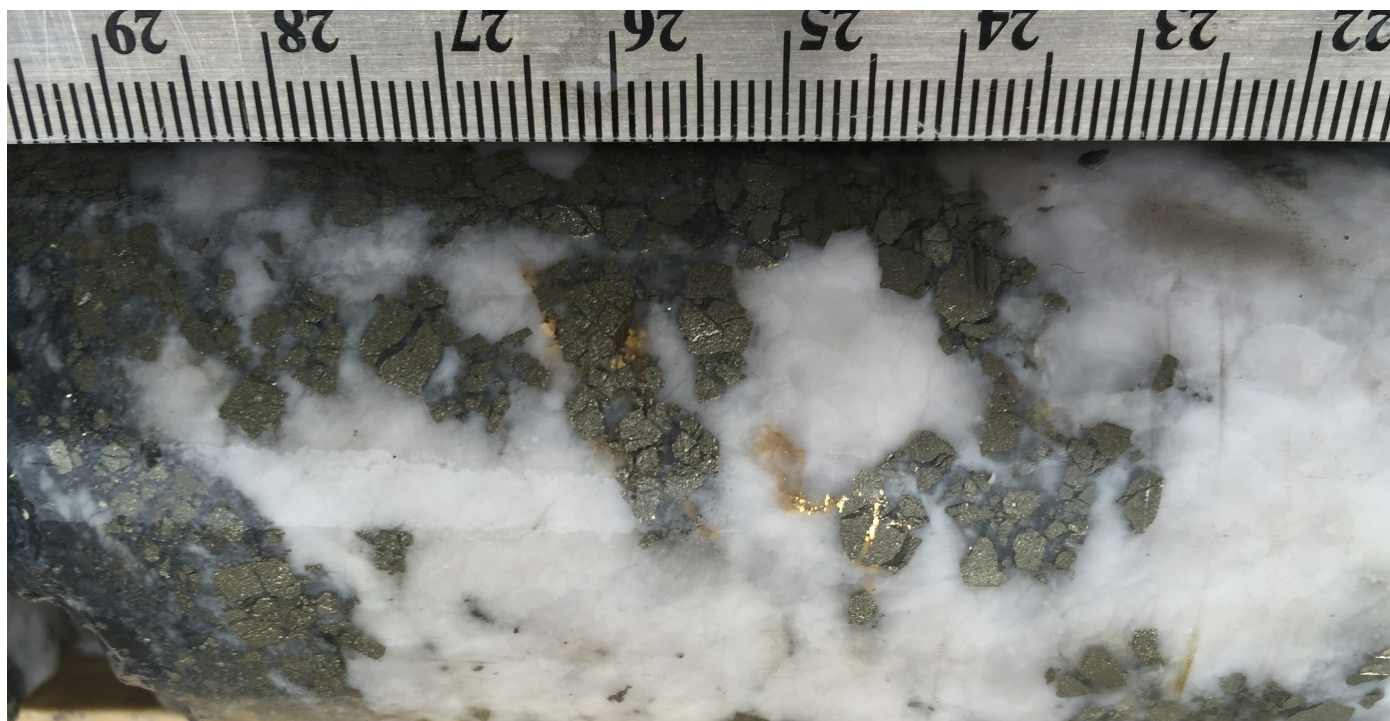
In May 2018, Aura announced that a summer field program would take place at Greyhound, operated by Agnico Eagle, targeting areas to both the southwest and northwest of Aura Lake along a major isoclinal fold. The program was to include prospecting and additional till sampling over the southwest target to follow up on previous anomalous gold results in the area. An induced polarization (IP) survey was also planned for the fault system located along the eastern margins of the intrusion. Any anomalous results from till sampling were expected to be followed up with a drill program later in the summer; results from this program have not been released.

Exploration work results from Agnico's White Hills project were last reported in 2017 and included 315 m of drilling in four holes, an IP geophysical survey, and a prospecting campaign that collected nearly 400 samples. No results have been released.

The Hard Cash property is located on the shores of Ennadai Lake and within the Ennadai greenstone belt, consisting of two mineral claims with an area of 2,090 ha. Gold was first discovered on the property in 1946, and in subsequent decades seven showings have been identified. Gold is found in shear-hosted Archean lode gold settings, in stratabound iron formation, and in graphitic schists. The focus of work for both Silver Range and Panarc Resources, from which Silver Range purchased the property, has been the Archean lode gold Swamp showing.

Mineralization at the Swamp showing is found in steeply dipping quartz veins within a 60 to 100 m wide shear zone hosted by mafic volcanics rocks and associated with intense sericitization. Approximately 30 per cent of samples collected from the showing have returned gold values greater than 10 g/t Au and 100 g/t Ag. In 2016, Silver Range extended the strike length of the showing from 200 m to 1,400 m, and renamed this showing the Swamp Trend. The company also discovered the Pond Showing, 3.2 km southwest of and on strike with the Swamp showing. This work was followed up in 2017 with ground total magnetic field and horizontal loop electromagnetic surveys to define drill targets along the Swamp Trend. An attempt to use a man-portable drill to test these targets was unsuccessful. No further work was carried out at Hard Cash in 2018.

323	Hard Cash
Operator/Owner	Silver Range Resources Ltd.
Commodity	Gold
NTS	065C13, 065C14
Land Tenure	Crown
Location	392 km west of Arviat



Visible gold in drill core from the Boston deposit at Hope Bay. *Courtesy of TMAC Resources Inc*

 <b>324 325 326</b>	Hope Bay (Doris Mine <sup>1</sup> , Boston <sup>2</sup> , Madrid <sup>3</sup> )
Operator/Owner	TMAC Resources Inc.
Commodity	Gold
NTS	077A03 <sup>1,3</sup> , 077A06 <sup>1</sup> , 076O08 <sup>2</sup> , 076O09 <sup>2</sup> , 076O10 <sup>2</sup> , 076O15 <sup>3</sup> , 076O16 <sup>3</sup>
Land Tenure	Crown, Subsurface IOL, Surface IOL
Location	123 km southwest of Cambridge Bay <sup>1</sup> , 177 km southwest of Cambridge Bay <sup>2</sup> , 140 km southwest of Cambridge Bay <sup>3</sup>

TMAC Resources continued its development and exploration activities along its wholly-owned, 1,101 km<sup>2</sup> Hope Bay belt project. Following changes in management that were finalized in January 2018, the company focused primarily on improving gold recovery from the concentrator line as well as installing and commissioning a second concentrator line. With only a limited budget dedicated to exploration, TMAC continued drilling to delineate the ‘below the dyke’ (BTD) zone of the Doris deposit, and work to advance the permitting and improve the geological understanding of the Madrid North deposits.

The north-south trending Hope Bay greenstone belt is located in the Bathurst Block in the northeastern portion of the Slave Structural Province and covers an area roughly 80 km long and up to 20 km wide. Archean mafic metavolcanic rocks and intermediate to felsic metavolcanic rocks with interbedded metasedimentary units dominate the belt, with lesser amounts of ultramafic rocks. Felsic intrusions along the eastern flank of the belt separate it from the Elu greenstone belt. Gold mineralization occurs along the entire belt and is classified as Archean lode-gold type. At the Doris deposit located at the northern end of the belt, mineralization is hosted in a steeply dipping quartz vein system hosted within a sequence of folded and metamorphosed pillow basalts. Gold mineralization in the Madrid Trend, mid-way up the belt, is generally associated with structural breaks and breccia zones, while mineralization at the Boston deposit, located at the southern end of the belt, is found within deformed quartz-carbonate veins hosted in a complex series of sedimentary-volcanic sequences. The total combined measured and indicated resources for the Hope Bay project stand at 4.91 million ounces of gold at an average grade of 8.6 g/t Au with an additional 1.69 million ounces of gold, grading 71 g/t Au, in the inferred resources category.

Since installing the first of two concentrator lines in 2017, TMAC struggled to achieve projected gold recoveries from the ore processing plant. Installation and wet commissioning

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of a second concentrator line was completed in May 2018, with rock commissioning commencing in early June. By mid-2018, TMAC achieved a steady improvement in gold recovery from 71 per cent in Q1 of 2018 to 85 per cent in June, resulting in production of 25,970 ounces of gold in Q2. The company experienced a significant drop in recoveries in July that brought recovery rates down to 75 per cent; this was corrected, and a recovery rate of 82 per cent was achieved by October. Additional gravity concentrator units have been installed and further adjustments are being made to bring gold recoveries above 90 per cent. Gold production in Q3 amounted to 33,100 ounces – the highest amount since the mine commenced commercial production.

The 2018, approximately 28,500-metre, exploration drilling program concentrated on the Doris deposit and on the Madrid North deposits. The BTM zone at Doris was drilled to increase and upgrade inferred mineral resources of the zone utilizing the newly developed exploration ramp. Over 19,000 metres of drilling were completed at Doris in the first three quarters of 2018. Highlights include intercepts grading 2,710 g/t Au over 0.7 m and 1,255 g/t Au over 1.5 m. The 75 drill holes totalling 9,452 metres drilled at Madrid Trend all concentrated on near-surface infill drilling at the Naartok East and West deposits. Highlights include 7.4 g/t Au over 65.7 m and 6.6 g/t Au over 42.2 m at Naartok West, and 11.0 g/t Au over 12.5 m at Naartok East.

In addition to delineation and infill drilling at the Doris and Naartok deposits, TMAC completed a limited regional exploration program consisting of two regional exploration drill holes and collecting 790 glacial till samples from the northern portion of the belt. These till samples, in addition to ones collected during the 2016 and 2017 programs, provide the company with total coverage of the northern portion of the belt and of areas proximal to the Boston deposit in the southern part of the belt. The two regional exploration drill holes totalling 758 metres were designed to provide stratigraphic information within a broad, sediment-covered valley between the Madrid and Doris deposits.

In September, TMAC announced a public offering of \$90 million, of which \$20 million has been budgeted toward exploration. On November 11, 2018, TMAC received its project certificate from NIRB for the Madrid and Boston projects. TMAC also expects to receive its Type A Water licence in Q1 of 2019, following recently-concluded Nunavut Water Board hearings.

Exploration plans for 2019 include drilling programs at the Doris BTM, Madrid, and Boston deposits with the aim to increase the mineral resources at the BTM and Suluk zones, and to define high-grade ore plunges at Boston. Early drilling will also concentrate on regional targets proximal to the Boston deposit with additional exploration targeting anomalies delineated through earlier till surveys.

327	Kahuna Gold
Operator/Owner	Solstice Gold Corp.
Commodity	Gold
NTS	055J13, 055J14, 055N01, 055N08, 055O02 – 055O07
Land Tenure	Crown, Surface IOL
Location	45 km northeast of Rankin Inlet

In late 2017, Solstice Gold was spun out of Dunnedin Ventures Inc. to focus on the gold potential of the Kahuna project area, with the latter company continuing to explore for diamonds (refer to Kahuna Diamond project, p. 27). The property is located between the communities of Rankin Inlet and Chesterfield Inlet, and adjacent to Agnico Eagle's advanced Meliadine gold project. Solstice has primary mineral title to 66 claims within the project area, a 50 per cent interest to another 12, and secondary rights to 67 claims held by Dunnedin Ventures. Gold was first discovered in the region in 1972 within what is now the Meliadine property, and additional prospecting for gold took place in claims adjacent to Kahuna between 1990 and 2006. Although work in the Kahuna project area under Shear Minerals and Stornoway Diamond Corporation between 2001 and 2009 focused on diamonds, the gold potential of the area was recognized early on. A technical evaluation was carried out in 2004, along with analysis of drill core samples and till samples for gold, returning anomalous results.

The Kahuna Gold project is situated within the Hearne Domain of the Churchill Province, and underlain by metasedimentary and granitic rocks of the Ennadai-Rankin granite-greenstone belt. Numerous northwest and east-west trending faults are known on the property and are of similar orientation to the Pyke Fault system that is spatially related to the gold deposits at Meliadine.

In 2018, Solstice carried out regional geological mapping, rock sampling, and till sampling across the Kahuna property, collecting a total of 2,876 rock samples and 2,049 high-resolution till samples. Results from till sampling in the Westeros area defined at least eight potential source areas, and a fence of 69 RAB drill holes completed across this Westeros area tested for favourable rock types in areas covered by glacial till. These shallow holes confirmed the presence of metasedimentary rocks, including banded iron formation, the dominant gold host at Meliadine, and metavolcanic rocks near magnetic anomalies at the base of the overburden. In the Westeros North area, 1,675 line-km of ground magnetic surveys were carried out to successfully confirm the structural interpretation generated from historical airborne surveys.

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Results from the rock samples have defined five targets, most in the Westeros area in the southwest portion of the property. The Qaiqtuq target is located north of the Westeros Fold Nose showing, and is 15 km<sup>2</sup> in area. Within Qaiqtuq, gold mineralization is found in boulders believed to be locally sourced, and locally in outcrop, with grab samples returning up to 66.6 g/t Au and 5.74 g/t Au, respectively. This target area is associated with east-west structures and coincident magnetic and electromagnetic anomalies. The Westeros North and Westeros South targets are located along the north and south limbs of the Westeros fold. Westeros North is coincident with regional fault structures and returned samples of up to 12.7 g/t Au from a metasedimentary boulder with quartz veining. Westeros South is associated with a strongly magnetic underlying rock unit cut by faults, and returned values up to 11.66 g/t Au.

Two other targets, Megafold Nose and Megafold NWL, were defined in the central and northwest portion of the project area and are interpreted as the nose and northwestern limb of a large regional fold that splays off the Raptor Westeros fault zone. The Megafold NWL target returned up to 24.4 g/t Au from a 1 m-wide quartz vein hosted in iron formation outcrop.

Solstice has indicated that the Qaiqtuq target area is expected to be the focus of exploration on the property in the future.

<b>328</b>	Kiyuk
<b>Operator/Owner</b>	Cache Exploration Inc.
<b>Commodity</b>	Gold
<b>NTS</b>	065C07 – 065C10
<b>Land Tenure</b>	Crown
<b>Location</b>	349 km west of Arviat

The Kiyuk gold project is located in the southwestern corner of the Kivalliq region, near the border with Manitoba and consists of 70 mineral claims covering approximately 59,000 ha. Prospectors discovered gold mineralization in the area in 1991. The project area has been explored by several operators intermittently since 1992, with most work occurring under Newmont between 2006 and 2008 and Prosperity Goldfields between 2011 and 2013. Cache Exploration fulfilled the terms of an option agreement with Montego Resources Inc. in 2017, and now holds 100 per cent interest in the property.

Gold mineralization at Kiyuk is intrusion-related and hosted in Paleoproterozoic metasedimentary rocks of the Kiyuk and Hurwitz groups which unconformably overlie Archean basement. Mineralization is characterized by sodic and calcic alteration, and associated with pyrrhotite, pyrite,

arsenopyrite, and magnetite, although can also occur as free gold. There are more than 10 prospects known on the property, with most work having focused on Rusty, Gold Point, and Cobalt, all of which have been drill-tested.

In 2017, Cache carried out a summer exploration program consisting of till sampling, prospecting, and diamond drilling. Two new targets were identified: East Gold Point, through drilling with results of up to 6.51 g/t Au/10.0 m; and Nansen, through prospecting and till sampling. Drilling at Rusty returned results of up to 26.4 g/t Au/8.0 m.

No work was carried out on the property in 2018, although Cache has indicated plans to continue exploration at Kiyuk in 2019.

<b>329</b>	Kuulu
<b>Operator/Owner</b>	NxGold Ltd.
<b>Commodity</b>	Gold
<b>NTS</b>	055N01, 055N02
<b>Land Tenure</b>	Subsurface IOL
<b>Location</b>	41 km northwest of Rankin Inlet

NxGold optioned the Kuulu project (formerly the Peter Lake project) from Meliadine Gold Ltd. in 2016. The property is adjacent to Agnico Eagle's advanced Meliadine gold project, and consists of a 4,184 ha MEA in subsurface IOL parcel RA-12. The focus for exploration at Kuulu is quartz-carbonate vein-hosted gold, although there is potential for iron formation- and shear-hosted gold, and for copper-nickel-PGE deposits hosted in komatiites or ultramafic intrusions.

The property is transected by the regional Dickson-Pyke fault that separates the Eastern Fold Structure, a folded package of volcanic and metasedimentary rocks, from the Western Magnetic Linears, locally carbonatized and magnetically altered amphibolite, gneiss, and granitoid rocks. Gold mineralization has been found in quartz boulders and quartz stockwork within three areas along the hinge and limbs of the Eastern Fold Structure, and in altered amphibolite boulders in the Western Magnetic Linears.

The 2017 exploration program at Kuulu was intended to include diamond drilling, helicopter-supported magnetic and electromagnetic geophysical surveys, and rock and till sampling. Only the geophysical surveys were completed because of persistent delays in land use licences being renewed by the Kivalliq Inuit Association. In November 2017, NxGold delivered a notice of force majeure to Meliadine Gold Ltd. suspending the company's obligations under the option agreement due to the continued delays. No exploration work was carried out in 2018.





Setting up for a VTEM survey, Western Atlas' Meadowbank project. Courtesy of Western Atlas Resources Inc

330	Meadowbank Mine
Operator/Owner	Agnico Eagle Mines Limited
Commodity	Gold
NTS	056D13, 056E04, 066A16, 066H01, 066H02
Land Tenure	Crown, Subsurface IOL
Location	76 km north of Baker Lake

The Meadowbank mine has been in operation since 2010, and has produced nearly three million ounces of gold over that time. Operations at the mine support a variety of businesses in Baker Lake and elsewhere in Nunavut, and the mine has a workforce of approximately 700 people. The mine infrastructure and deposits are all located on IOL with grandfathered Crown mining leases, with the tenure covering 68,735 ha. The Vault deposit, including the Vault extension, is also located on subsurface IOL and covered by a Mineral Production Lease with Nunavut Tunngavik Incorporated (NTI). Amaruq (refer to p. 50), a satellite deposit approximately 50 km to the northwest of Meadowbank, was linked to the mine site in August 2017 by a 64-km, all-weather road that will facilitate the use of existing production infrastructure at the mine.

Gold production at Meadowbank over the first nine months of 2018 was 189,333 ounces, approximately 29 per cent lower than the 267,480 ounces produced over the same period of 2017, in addition to 143,000 ounces of silver production. The decrease in gold production is due to lower

grades at the Vault and Portage pits as the Meadowbank mine site nears the end of its mine-life; however, better than expected grades allowed for higher production in Q3 2018 than Q2. Production in 2019 is expected to reach 60,000 ounces before Meadowbank operations cease, consisting of ore mined from the Portage pit being supplemented with stockpiled ore material. The all-in cost per ounce of gold produced at Meadowbank over the nine months ending September 2018 was \$852; this is a significant increase over the costs per ounce for the same timeframe ending September 2017, of \$614/ounce; this increase correlates with the decrease in production.

The deposits are underlain by the Woodburn Lake Group comprised of structurally complex quartzite, ultramafic to felsic volcano-sedimentary rocks and banded iron formation that have been intruded by later granitoids and lamprophyres. The host rocks and associated gold deposits are within rocks at the greenschist to amphibolite grade of metamorphism. At the Goose pit, now depleted, and Portage pit, mineralization is hosted in the sulphides in deformed iron formation units, or in gold-bearing quartz-sulphide veins in volcano-sedimentary rocks. The Vault deposit is hosted in gently-dipping volcanic rocks and porphyry dykes that exhibit metre-scale zones of hydrothermal alteration.

In February 2017, Agnico Eagle and the Kivalliq Inuit Association signed an updated IIBA for the Meadowbank mine. This new agreement replaces the earlier agreement signed in 2011 and ensures that local employment, training, and business opportunities arising from the gold projects are accessible to Inuit living in the Kivalliq region.

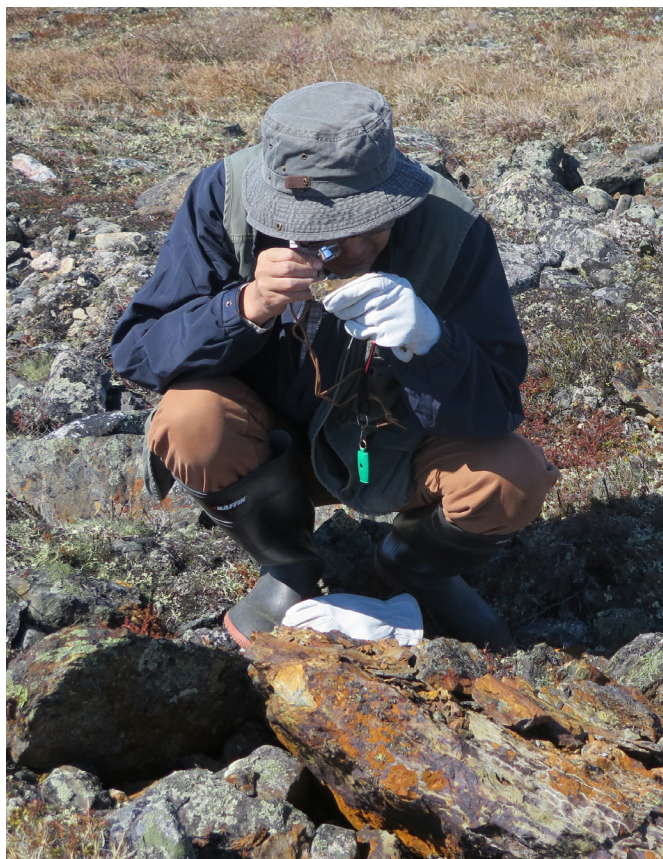
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<b>331 332 333</b>	Meadowbank (Area A <sup>1</sup> , Area B <sup>2</sup> , Area C <sup>3</sup> )
<b>Operator/Owner</b>	Western Atlas Resources Inc.
<b>Commodity</b>	Gold
<b>NTS</b>	056D12 <sup>2</sup> , 056D13 <sup>2</sup> , 066A09 <sup>2,3</sup> , 066A10 <sup>3</sup> , 066A16 <sup>2</sup> , 066H01 <sup>1</sup> , 066H08 <sup>1</sup>
<b>Land Tenure</b>	Crown
<b>Location</b>	97 km north of Baker Lake <sup>1</sup> , 48 km north of Baker Lake <sup>2</sup> , 31 km northwest of Baker Lake <sup>3</sup>

Western Atlas Resources Inc.'s 100 per cent owned Meadowbank Area property covers three separate blocks of claims – the A, B, and C Blocks - on Crown land, totalling 56 claims over 57,844 ha. The grassroots project, located near Agnico Eagle Mines Ltd.'s all-weather road to the Meadowbank Mine, was staked in January and February 2017. Geologically, the project is located in the Rae Domain of the Western Churchill Province, specifically in the Woodburn Lake Group that hosts many known gold occurrences and deposits. Local geology of the property includes strongly foliated intermediate to felsic metavolcanic rocks, related epiclastic sedimentary rocks, ultramafic units, and magnetite-iron formation units. Many of these units are intruded by large granitic plutons.

The company conducted programs on the property in both the 2017 and 2018 summer field seasons. The 2017 program included a 3,800 km airborne magnetic survey flown in the late spring, and prospecting and grab sampling programs in July and August. In September 2017, Western Atlas released a NI 43-101 technical report on the property summarizing the historical and current work to date.

The 2017 work was followed in 2018 with an exploration program including a 1,518 km helicopter electromagnetic geophysical survey, a three-km ground IP survey targeting the A and B Blocks, regional and local scale mapping, collection of 705 rock samples, till sampling, and RAB drilling on specific targets in the B Block. Several high-potential northeast-southwest trending anomalies were identified in the electromagnetic data, with strike-lengths ranging from 400 metres to 7.1 kilometres and at depths from 75 to 300 metres. Results from the IP survey showed anomalies coincident with those identified in the electromagnetic data. The best results from the grab sampling program include 4.10 g/t Au, 6.6 g/t Au and 44.3 g/t Ag, and 13.3 g/t Au.



Geologist examining a hand sample, Western Atlas' Meadowbank project. Courtesy Western Atlas Resources Inc

The company plans a drill program for 2019 to follow up on targets identified in the 2018 work.

<b>334</b>	<b>Meliadine</b>
<b>Operator/Owner</b>	Agnico Eagle Mines Limited
<b>Commodity</b>	Gold
<b>NTS</b>	055J13, 055J14, 055K15, 055K16, 055N01, 055N02, 055O03, 055O04
<b>Land Tenure</b>	Crown, Subsurface IOL
<b>Location</b>	18 km north of Rankin Inlet

The Meliadine project is an advanced development gold property that Agnico Eagle Mines Limited acquired from Complex Minerals Corp. in 2010. The property currently consists of 111,358 ha on Crown mineral claims and grandfathered Crown mineral leases on IOL, and an additional 4,827 ha under a MEA with NTI. Surface rights for the grandfathered lease and MEA are administered by

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the Kivalliq Inuit Association. The property is accessible from the community of Rankin Inlet by a 25 km all-season-road constructed by Agnico Eagle in 2013. The company was issued a project certificate in 2015 from the NIRB and signed an IIBA with the Kivalliq Inuit Association that same year. In 2016, Agnico Eagle received its Type A water licence from the Nunavut Water Board and in February 2017, the company's Board of Directors approved the construction of the Meliadine mine.

The property is located in the northern portion of the Archean Rankin Inlet greenstone belt that includes deformed mafic volcanic rocks, felsic pyroclastic rocks, sedimentary rocks, and gabbro sills, and is locally metamorphosed from lower to middle greenschist grade. Known deposits within the Meliadine gold trend are mainly located along the Pyke Fault, a high-strain shear zone several kilometres wide and extending over 80 km in length. Locally, mineralization occurs in association with quartz-carbonate-bearing shear zones and/or laminated quartz vein systems. The most intense and consistent gold grades at Meliadine are structurally controlled, and are hosted within multiply deformed turbidic and sulphidized iron formation units of the Tiriganiaq and Upper Oxide formations. The major deposits – Tiriganiaq, Normeg, Wesmeg, Wolf, Pump, and F Zone – occur within a five-kilometre radius, with the Discovery deposit located 17 km to the southeast.

The most recent resource estimates – as of December 2016 – for the Meliadine deposits include 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 g/t. The indicated resources of the total open pit and underground resources are estimated at 20.8 million tonnes of ore grading 4.95 g/t Au; the inferred resources are 14.7 million tonnes of ore grading 7.51 g/t Au. The estimated average metallurgical recovery is approximately 96 per cent. Operational start-up will take place in two phases. Mill throughput of Phase 1 is expected to be approximately 3,750 tonnes per day and will be sourced solely from underground via two access ramps. By year five, Phase 2 will include an increase to approximately 6,000 tonnes per day, with the additional ore sourced from an open pit.

The total initial capital cost estimates for the first gold ounce produced at the Meliadine project is approximately \$900 million. With construction and development at the site marginally ahead of schedule, the start of operations at the mine has been advanced to Q2 2019 from Q3 of the same year; in September 2018, construction was 89 per cent

complete. Within the first nine months of 2018, Agnico Eagle spent \$296 million of its planned \$398 million budget for Meliadine. The 2018 sealift was completed and construction of a bypass road from Rankin Inlet to Meliadine was also completed, allowing construction materials to be transported continuously to the site. Much of the construction included production infrastructure; the processing plant completion is expected in December 2018, with the crusher installation expected by late January 2019. Underground construction also continues, with a total of 6,121 metres of Ramp 3 and lower level development by the end of Q3 2018. Four production stopes are expected to be complete by Q4 2018. Underground delineation drilling is ongoing, with a total of 15,590 metres completed to date; results from the drilling have been consistent with the existing block model for the deposit. Conversion drilling continues with results expected in February 2019.

Initial feeds at the process plant will consist of stockpiled material grading approximately 8.5 g/t Au. Production for 2019 is estimated at 170,000 ounces, ramping up to 385,000 ounces in 2020; in terms of production in tonnes per day (tpd), the initial phase will begin at approximately 3,750 tpd, with Phase 2 reaching approximately 6,000 tpd.

Meliadine's mine life is planned for 15 years, with a total estimated overall gold production of 5 to 7 million ounces. However, the length of mine life could increase, as many of the known deposits at the site remain open below a depth of 450-metre, indicating there is significant potential for further discoveries in the greenstone belt.

335	Pistol Bay
Operator/Owner	Northquest Ltd.
Commodity	Gold
NTS	055K05 – 055K07, 055K12, 055L08, 055L09
Land Tenure	Crown, Surface IOL
Location	49 km northwest of Whale Cove

Northquest Ltd., a subsidiary of Nordgold SE, is the 100 per cent owner of the Pistol Bay project. The Pistol Bay property, acquired by Northquest in 2010, consists of 89 claims totaling 78,121 ha. The property located near Whale Cove covers both historical and newly discovered gold showings, with the majority of recent exploration focusing on the Vickers deposit.



Geologist in the field, Pistol Bay project. Courtesy of Nordgold SE / Northquest

Geologically, the project is underlain by the Kaminak Group in the Rankin-Ennadai greenstone belt in the Churchill Province’s Hearne Domain; these rocks are comprised of volcanic and volcanoclastic rocks, iron formation, mudstones, and siltstones. Numerous syn-volcanic to late tectonic igneous intrusions are also found and have been dated at an age of approximately 2.7 billion years (Ga). The tectonic setting is interpreted as a series of back-arc islands accreted to the Rae Craton. Minor Paleoproterozoic rocks of the Hurwitz Group also underlie the property.

The Vickers deposit, located in the central part of the property, has an NI 43-101-compliant inferred resource estimated at 739,000 ounces gold at a grade of 2.94 g/t. Mineralization is hosted in quartz-sericite-carbonate schists that occur in sequence with minor proto-mylonite and follow the contact between the schists and a diorite intrusion. The Howitzer showing, discovered through the 2015 till sampling program, has mineralization concentrated near the southern contact of the Gill South pluton, a quartz monzonite-quartz monzodiorite body.

In July 2016, the sale of Northquest to Nordgold SE was finalized. The 2016 summer field season involved an extensive program on the Pistol Bay property, including drilling, till sampling focusing on the Gill South prospect, and geological mapping. In 2017, Northquest focused on detailed geological mapping, prospecting, and rock chip sampling conducted over all known targets. The resulting data resulted in an improved understanding of the regional and deposit-scale geology, and controls on gold mineralization. The company also completed a till sampling program on the western half of the property and a detailed IP survey on the eastern half.

The 2018 exploration program at Pistol Bay included local-scale and regional-scale geological mapping, rock chip sampling, and infill glacial till sampling, predominantly in the eastern half of the Pistol Bay property. To assist with a planned update to the Vickers deposit model, a major program of re-logging of historic core was also undertaken. No results have been released.

336 337 338 339 340 341 342	South Kitikmeot Gold (Bling <sup>1</sup> , Esker Lake <sup>2</sup> , Goldbugs <sup>3</sup> , Hiqiniq <sup>4</sup> , Qannituq <sup>5</sup> , Uist <sup>6</sup> , Ujaraq <sup>7</sup> )
<b>Operator/Partner</b>	Amaroq Gold Corp., Silver Range Resources Ltd.
<b>Commodity</b>	Gold
<b>NTS</b>	076C14 <sup>3</sup> , 076C15 <sup>2,3</sup> , 076C16 <sup>1,2</sup> , 076E10 <sup>7</sup> , 076E11 <sup>4,7</sup> , 076E14 <sup>4</sup> , 076F01 <sup>3,6</sup> , 076F02 <sup>3</sup> , 076F03 <sup>3</sup> , 076G04 <sup>6</sup> , 076G10 <sup>5</sup>
<b>Land Tenure</b>	Crown <sup>1,7</sup> , Surface IOL <sup>1</sup>
<b>Location</b>	425 km southeast of Kugluktuk <sup>1</sup> , 413 km southeast of Kugluktuk <sup>2</sup> , 409 km southeast of Kugluktuk <sup>3</sup> , 276 km south of Kugluktuk <sup>4</sup> , 432 km southeast of Kugluktuk <sup>5</sup> , 418 km southeast of Kugluktuk <sup>6</sup> , 287 km south of Kugluktuk <sup>7</sup>

Silver Range Resources Ltd. grouped seven of its gold properties initially covering over 25,000 ha in the southern Kitikmeot region and underlain by the Beechey Lake Group

## ACTIVE PROJECTS — GOLD

into the South Kitikmeot Gold project. The seven properties are Uist, Goldbugs, Esker Lake, Hiqiniq, Ujaraq, Qannituq, and Bling. In February 2018, Silver Range was awarded additional permits totalling over 47,000 hectares close to its Gold Bugs, Esker, and Bling properties, expanding the size of the project to almost 73,000 ha in mineral claims and prospecting permits.

Gold mineralization at the South Kitikmeot Gold project is hosted primarily in altered, sulphidized iron formations of the Beechey Lake Group, which is also the host of gold mineralization at Sabina Gold and Silver Corp.'s Goose and George projects, and at the past-producing Lupin gold mine. The only South Kitikmeot Gold prospect not exclusively hosted within iron formation rocks is Bling, which occurs along the contact between metasedimentary and mafic volcanic rocks. Gold mineralization at Bling is associated with massive to predominantly disseminated sulphides in a horizon traceable for over 700 m along strike. Historical sampling from this prospect returned assay values of up to 47 g/t Au. In 2016 and 2017, Silver Range conducted limited sampling, prospecting, and ground magnetic and electromagnetic geophysical surveys at the Uist, Bling, and Qannituq properties, from which no results have been released.

In March 2018, the company announced that it had signed a letter of intent that would allow Amaroq Gold Corporation to purchase 100 per cent interest in the South Kitikmeot Gold project. The purchase agreement includes cash considerations of \$1,725,000 and shares of Amaroq issued to Silver Range over five years. Silver Range retains a three per cent net smelter return in the project, and remained the operator for the 2018 exploration season.

No results from any exploration activities at the South Kitikmeot Gold project were released by either company.

343	Tree River
Operator/Owner	Silver Range Resources Ltd.
Commodity	Gold
NTS	086P01
Land Tenure	Crown, Surface IOL
Location	145 km southeast of Kugluktuk

Silver Range Resources Ltd. is a project-generating company with several properties in the Kivalliq and Kitikmeot regions, as well as in NWT, Yukon, and Nevada. The company

obtained three prospecting permits totalling 39,250 ha located 155 km southeast of Kugluktuk. The Tree River property hosts gold mineralization in Archean quartz pebble conglomerates (QPC), similar to deposits found at Witwatersrand (South Africa) and Pilbara (Australia). In addition to bearing lithological similarities, the timing of the deposition of the quartz pebble conglomerates – between 2,940 and 2,700 Ma – at Tree River is within the timing of the gold deposition event at Witwatersrand.

The Tree River property is located in the northern part of the Anialik greenstone belt. This property straddles the volcanic-sedimentary rock contact with a QPC unit located approximately 80 m up-section from the contact. The QPC unit ranges in thickness from 15 to 20 metres and has been traced with some success and sampled by previous explorers for approximately 7 km. The gold-bearing section of the unit ranges in thickness between 4 and 8 metres and occurs in the bottom section of the QPC unit. Pyrite is the predominant sulphide with localized pods of up to 25% pyrite with evenly disseminated (1-2 per cent) pyrite throughout the unit. Arsenopyrite, chalcopyrite, stibnite, and sphalerite are also present in this unit.

BHP Billiton and Strongbow Exploration explored the Tree River area between 1992 and 2007. Grab samples collected assayed up to 142 g/t Au with channel samples returning values grading up to 63.15 g/t Au over 0.35 metres and 540 g/t Au over 0.20 m. The prospects on this property have not been drilled.

In August, Silver Range announced the start of a summer exploration program consisting of geological mapping, prospecting and sampling. The program took place in mid-to late-August and consisted of a two-person crew who prospected and collected a total of 88 rock samples. Two mineralized zones (Main and West Zones), approximately 4 km strike-length distance apart, were sampled and prospected. The Main Zone, located in the northeastern portion of the property, consists of a partially exposed, 650 metre long, strongly silicified mineralized zone. The West Zone consists of similarly altered and mineralized QPC exposed over the strike-length of 300 metres; this zone remains open along strike. Fifty-seven of the 88 samples collected were QPC and returned assay values of up to 9.88 g/t Au from the Main Zone and 14.05 g/t Au from the West Zone. Of the 57 QPC samples collected, four assayed at grades greater than 9 g/t Au with the remainder of samples averaging at 0.20 g/t Au. Silver Range did not disclose future exploration plans for the property.



Exploration drilling at Deposit No 2, with view of Deposit No 1 in the background, Mary River project. *Courtesy of BIMC*

344	Yandle
Operator/Owner	Silver Range Resources Ltd.
Commodity	Gold
NTS	065H10, 065H15
Land Tenure	Crown, Surface IOL
Location	149 km northwest of Arviat

The Yandle project is located within the Ennadai-Rankin greenstone belt, and was staked by Silver Range in 2017. The project consists of two claims covering 2,500 ha, and includes the Yandle and Aruat showings which were explored by Comaplex Resources Ltd. and Cumberland Resources Ltd. from the early 1990s through 2002. These companies carried out prospecting, mapping, geophysical surveys, and a nine-hole diamond drill program on the Yandle showing. This work

defined a 4.5 km long by 100 m wide zone of arsenopyrite and pyrite-bearing schists at the contact between mafic and intermediate volcanic rocks. Grab samples returned results of up to 25 g/t Au at Yandle and 59 g/t Au at Aruat. Historical drilling at Yandle by Comaplex, and later Placer Dome, returned values up to 11 g/t Au/3.0 m, 17.5 g/t Au/1.25 m, and 2.5 g/t Au/2.8 m.

Reconnaissance prospecting was carried out over the showings in 2010 and 2011 by Diamonds North Resources, from which no results were reported. Since staking the project, Silver Range carried out a program of geological mapping and sampling, as well as ground total magnetic field and horizontal loop electromagnetic field surveys in 2017. Samples collected from the contact between a gabbroic intrusive unit and intermediate volcanic rocks returned up to 15.1 g/t Au, and will be the focus of future work. No further work was carried out in 2018.

## ACTIVE PROJECTS — IRON



<b>X 401</b>	<b>Mary River Mine</b>
<b>Operator/Owner</b>	Baffinland Iron Mines Corporation
<b>Commodity</b>	Iron
<b>NTS</b>	037C09, 037C10, 037C15, 037C16, 037D13, 037E04, 037F01, 037F09, 037F10, 037F12 – 037F16, 037G01 – 037G07, 037G11, 037G12, 047H08
<b>Land Tenure</b>	Crown, Subsurface IOL, Surface IOL
<b>Location</b>	155 km south of Pond Inlet

Baffinland Iron Mines Corporation's (BIMC) Mary River iron mine has been in production since late 2014. The property consists of 330 claims and three MEAs covering 305,339 ha and 48,626 ha, respectively, for a total land holding of 353,965 ha. These land holdings include 28 new claims covering 25,654 ha staked during the 2018 field season.

The initial iron ore discovery in the Mary River region occurred in 1962 with subsequent exploration continuing until 1965. No further exploration work occurred until BIMC acquired the property in 2004.

Nine deposits and several additional prospects are hosted in metasedimentary and metavolcanic rocks of the Mary River Group that date between 2.76 and 2.71 billion years (Ga). The Mary River Group has been impacted by three separate tectonic events, the most important being the Trans-Hudson Orogeny at 1.8 Ga. High-grade iron ore generally occurs as hematite, magnetite, or specularite in banded iron formation rocks, and is associated with large-scale fold structures along structural boundaries. Iron mineralization at Deposit No. 1, the main deposit, averages 64% Fe. Mining operations began in 2014 with the first ore shipment to European steel plants leaving the Milne Inlet port in August 2015.

In 2018, BIMC shipped an estimated 5.1 million tonnes (Mt) of iron ore from the Milne Inlet port to Europe, the United Kingdom, Taiwan and Japan. This represents a one million tonne increase from the previous year's record-breaking amount of 4.1 Mt. Ore was transported by truck along the company's tote road throughout the year to the port where the ore was stockpiled. Shipping from the Milne Inlet port occurred from July 24 to October 17, 2018, consisting of 71 shipments averaging 71,750 t each.

BIMC is in the process of amending its Phase 2 proposal with the NIRB. The current proposal involves increasing the quantity of ore shipped through Milne Port to 12 Mt, via the construction of a new railway (the North Railway) running parallel to the existing tote road. Additionally, to




accommodate the increased shipping from the Milne Inlet port, infrastructure at the mine site will be re-arranged, port facilities will require upgrading and there will need to be construction of supplementary infrastructure including a second ore dock. The total mine production will ultimately increase to 30 Mt, with 12 Mt being transported via the North Railway to Milne Port and 18 Mt transported via the previously approved, although as yet unconstructed, South Railway to Steensby Inlet Port.

In 2016, the NIRB indicated that the Phase 2 proposal would require a new conformity determination from the Nunavut Planning Commission (NPC). In February 2017, BIMC submitted the Phase 2 proposal to the NPC; the commission granted an amendment in March 2018 to the North Baffin Regional Land Use Plan to accommodate BIMC's Northern Transportation Corridor proposal. The company submitted its final environmental impact statement (FEIS) addendum to NIRB in August 2018, and a revised version in October after being informed the submission did not conform to NIRB's EIS guidelines. BIMC received a positive conformity determination in October. This conformity determination initiated the public technical review phase that will include a set of technical meetings in Iqaluit from March 12 to 15, 2019. These meetings will be held jointly with the Nunavut Water Board.

In a separate NIRB submission in April 2018, BIMC proposed an amendment to increase from 4.2 Mt to 6 Mt the ore allowed to be trucked annually from the mine to Milne Inlet port. In August 2018, the NIRB made its recommendations on the amendment; the organization recommended that fuel tanks and accommodations be approved but did not recommend the production increase. On September 30, 2018, the Responsible Ministers accepted the NIRB's recommendation to allow the fuel storage and accommodations, but also allowed increased ore transportation and shipping in 2018 and 2019. The NIRB officially amended BIMC's project certificate in October, 2018.

BIMC conducted a \$9.3 million exploration program for 2018. The program consisted of prospecting and follow-up surface sampling at key prospects to characterize anomalous precious metal trends. Three airborne geophysical surveys were also conducted, including: a 1,116-line km gravity survey over the Turner River claim blocks that resulted in the discovery of a large gravity anomaly near a surface exposure of high-grade iron formation; an 8,043 line-km gravity and magnetic survey over the western portion of the Central Fold belt identified several moderate scale geophysical anomalies; and a 4,866 line-km magnetic and electromagnetic survey over selected portions of BIMC's southern land tenure. The work also included a 12-hole, 2,552.5 m HQ-diameter ore characterization diamond drill program. Results from the 949 grab samples and 625 drill core samples collected are pending.

## INACTIVE PROJECTS

Number	Project	Owner
 <b>Base Metals</b>		
103	Arctic Copper	Arctic Copper Corp.
104	Coppermine River	Kaizen Discovery Inc.
 <b>Diamonds</b>		
205 - 207	Contwoyto-205, Hood River-206, Muskox-207	Benchmark Metals Inc.
 <b>Gold</b>		
345	Arcadia Bay	West Kitikmeot Gold Corp.
346	Fire Shear	West Kitikmeot Gold Corp.
347, 348	Grumpy-347, Happy Thought-348	Silver Range Resources Ltd.
349	Itchen Lake	West Kitikmeot Gold Corp.
350 - 352	Nigel-350, Noomut-351, Quartzite-352	Silver Range Resources Ltd.
 <b>Uranium</b>		
501	Angilak	ValOre Metals Corp.
502	Mountain Lake	IsoEnergy Limited
<b>503</b>	<b>Kiggavik</b>	Orano Canada Inc., Daewoo International Corporation, JCU Exploration (Canada) Co. Ltd.
504	St. Tropez	Orano Canada Inc.

The Coppermine River area of the Kitikmeot, southwest of Kugluktuk, includes two copper projects: **Coppermine** owned by Kaizen Discovery Inc. and the adjacent **Arctic Copper** (or Coppermine River) owned by Sitka Gold Corp. through its subsidiary Arctic Copper Corp. The Arctic Copper project was staked in 2015, when a program of prospecting, geological mapping, and a ground gravity geophysical survey resulted in the discovery of the sediment-hosted Copper Leaf showing. Exploration at the Coppermine project in 2014 and 2015 consisted of rock-chip sampling, 2,060 m of diamond drilling, mapping, and prospecting, targeting sediment-hosted stratiform copper mineralization and volcanic-hosted copper-silver mineralization. The 2016 draft of the Nunavut Land Use Plan included proposed prohibitions on mineral exploration in the Coppermine River area; the uncertainty this created made it challenging for the companies to continue exploration on these properties. As a result, both companies have been granted a suspension of work requirements to maintain the mineral tenure under Section 51 of the Nunavut Mining Regulations.

Benchmark Metals Inc., formerly Crystal Exploration Inc., holds three diamond projects in Nunavut's Kitikmeot region. The **Contwoyto** property is located east of the past-producing Jericho diamond mine, and includes the pear-shaped Contwoyto kimberlite pipe discovered by Tahera Diamond Corporation in 1998. **Hood River** is located north of Jericho, and adjacent to the proposed Grays Bay road. The property includes the James River kimberlite dyke, discovered in 2004 by Ashton Mining. **Muskox** is located west of Jericho and includes the Muskox and Rush kimberlites, discovered by De Beers Canada in 1996 and 1994, respectively. The company carried out ground magnetic surveys, till sampling, prospecting, and mapping across the three properties in 2016. Following this program, six high priority kimberlite targets were identified for drilling testing, including three on the Muskox property, two at Contwoyto, and one at Hood River. In 2017 a drill program was announced to test these targets, but the company instead carried out a short drill program on the nearby Contwoyto Gold project (refer to p. 34) acquired from North Arrow Minerals. No further work has been reported on these properties.



## INACTIVE PROJECTS

West Kitikmeot Gold Corp., a subsidiary of Nunavut Resources Corporation, manages a portfolio of projects on Inuit Owned Land along the Izok Corridor. Following a project generator model, the company has identified several prospective properties that are available for joint venture.

**Arcadia Bay** is located near the Coronation Gulf within IOL parcel CO-31. The project is underlain by the rocks of the Anialik River igneous complex and the Anialik River volcanic belt, and past exploration has identified multiple Archean lode-gold showings. No work has been reported since a Mineral Exploration Agreement was signed with NTI in 2016.

**Fire Shear** is located near the Ulu and Hood River gold projects within IOL parcel CO-20 and underlain by the High Lake greenstone belt. The property contains greenstone- and iron formation-hosted Archean lode-gold occurrences, as well as a volcanogenic copper-zinc occurrence. A helicopter-borne electromagnetic survey was flown over the property in 2015 to identify drill targets, but no work has been reported since. Straddling the Northwest Territories-Nunavut border, **Itchen Lake** contains many banded iron formation-hosted gold occurrences based on historic exploration. Based on sampling, mapping, and geological surveys carried out between 2012 and 2015, 17 drill targets were identified for follow-up, but no further work has been reported.

Another project generator, Silver Range Resources Ltd., has acquired a portfolio of projects in Nunavut over the last several years. In the Kitikmeot, this includes the **Grumpy** and **Happy Thought** projects. Grumpy hosts Archean lode-gold mineralization and is located in the northern portion of the High Lake greenstone belt. Historic mapping, sampling, and trenching identified two showings with gold mineralization within quartz veins at the contact between felsic volcanic rocks and metasedimentary units. No work has been reported by the company. Happy Thought is located 100 km southeast of Grumpy and underlain by the Hood River sedimentary belt. The project includes seven historical gold showings hosted in sulphidized iron formations or felsic tuffs. Only cursory sampling was done by Silver Range in 2016. The **Nigel** project is located within the Ennadai greenstone belt and near the Nunavut-Northwest Territories border in the southwestern Kivalliq. The project includes three historical Archean lode gold-style showings. A prospecting program conducted in 2016 returned high grade gold values. **Noomut**, located northwest of Arviat, was staked in 2017 over a 1.9 km zone of oxide iron formation-hosted gold mineralization. Comaplex Minerals Corp. discovered the River West and River North showings on the property in the 1990s, and carried out sampling and



Aerial view of ValOre Metals Corp.'s Angilak camp. Courtesy of CIRNAC

## INACTIVE PROJECTS

a ground magnetic survey. No work has been conducted by Silver Range. Near Kaminak Lake, **Quartzite** includes 10 structurally hosted gold showings in three separate areas. Sampling to confirm historic assays was carried out in 2016. No further work has been reported on any of these projects.

ValOre Metals Corp., formerly Kivalliq Energy Corporation, operates the **Angilak** project west of Yathkyed Lake. The focus of exploration within the project area is the basement-hosted, hydrothermal vein-type, unconformity-associated Lac 50 uranium deposit. A 2013 NI 43-101 inferred resource for the deposit estimates it contains 43.3 million pounds of U<sub>3</sub>O<sub>8</sub> at an average grade of 0.69%, as well as 15.6 million pounds of copper, 10.4 million pounds of molybdenum, and 1.88 million ounces of silver. The last work reported on the property focused on the polymetallic Yat and Dipole targets in 2016. Enzyme leach soil sampling defined uranium-in-soil anomalies at both targets, and a coincident silver-in-soil anomaly at Yat. Trenching also returned high grade samples at Yat, with up to 23.6% U<sub>3</sub>O<sub>8</sub>, 22.7% Cu, 879 g/t Ag, and 5.25 g/t Au.

The **Kiggavik** uranium project is located west of Baker Lake in the eastern Thelon Basin, and has been explored since the 1970s. Orano Canada Inc., formerly AREVA Resources Canada, is the operator of the project under a joint venture

with Daewoo International Corporation and JCU Exploration (Canada) Co. Ltd. The project was advancing through the environmental assessment process in 2015 when the Nunavut Impact Review Board recommended that the project not proceed to the licensing and permitting stage of the process. The then-Minister of Indigenous and Northern Affairs Canada upheld this recommendation in 2016. The company subsequently announced that the project would be placed into care and maintenance indefinitely.

The **Mountain Lake** uranium deposit, staked by IsoEnergy Ltd. in 2017, is located in the Hornby Bay Basin southwest of Kugluktuk. The property was discovered in 1976 and has seen only intermittent work since. In 2006, Triex Minerals Corp. produced an inferred resource that estimated the deposit contains 8.2 million pounds U<sub>3</sub>O<sub>8</sub> at an average grade of 0.23%. Uranium mineralization at Mountain Lake is hosted in the mid-Proterozoic Dismal Lakes Group sandstone, and is a shallow-dipping, tabular zone of strata-bound mineralization found in bedrock at 10 to 30 m below surface to a depth of 180 m. No work by IsoEnergy has been reported on the project. As with the Arctic Copper and Coppermine projects discussed above, the Mountain Lake deposit is within a proposed prohibition on mineral exploration from the 2016 draft of the Nunavut Land Use Plan, and the company has been granted a suspension of work requirements under Section 51 of the Nunavut Mining Regulations.



Raised beaches caused by isostatic rebound, near the Mel project, south of Hall Beach. *Courtesy of North Arrow Minerals Inc*



Looking towards the Hudson Bay coast from the Mel project. *Courtesy of North Arrow Minerals Inc*

**Base metal** – a metal that corrodes or oxidizes easily, such as iron, lead, copper, or zinc.

**Breccia** – a type of rock made up of angular rock or mineral fragments that have been fractured by forces within the Earth and then cemented together. Breccias can be good hosts for mineral deposits because the fractures in the rock provide spaces 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 which needs more detailed study to be classified as a resource. Also known as a mineral deposit.

**Drilling** – the extraction of a sample of bedrock or other surface material such as glacial till or clay, in order to examine the occurrence of rock types, understand an area's geological structure, or verify the presence or absence of ore minerals.

**Element** – a pure substance that contains only one type of atom. Gold, copper, iron, and other metals are elements.

**Environmental impact statement (EIS)** – 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 type 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 collection of rock, soil, or water samples from a defined area and their subsequent chemical analysis in a laboratory, to identify abnormal concentrations of chemical elements that indicate the presence of metals or gemstones. Also referred to as geochemical exploration.

**Geophysical survey** – the collection of information associated with bedrock using sensing instruments. These surveys can be conducted from the air or the ground to detect physical properties of rocks such as magnetism, gravity or conductivity.

**Grab sample** – a rock sample, collected by hand, that is examined for its physical characteristics and chemically analyzed to determine whether valuable minerals or metals are present.

**Greenstone belt** – a linear zone or “belt” of metamorphosed volcanic rocks that often host deposits of gold and other valuable metals. Their 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/or extrusive rock. Kimberlite indicator minerals (KIMs) 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. Ultramafic rocks are rocks made up of greater than 90 per cent mafic minerals, and some can be used as carving stone.

**Mineral Exploration Agreement** – an agreement signed between Nunavut Tunngavik Inc. and exploration companies, which allows exploration on Inuit Owned Lands.

**National Instrument 43-101 (NI 43-101)** – a set of rules and guidelines for reporting information related to mineral exploration projects that are listed on Canadian stock exchanges.

**Ore** – a rock or mineral that contains an economically important metal, that can be mined and processed to produce that metal.

**Platinum-group elements (PGE)** – a group of metals including iridium, osmium, palladium, platinum, rhenium, rhodium, and ruthenium, that are highly resistant to tarnishing and corrosion. They are used in both industrial applications and in jewellery.

**Precious metal** – a metal such as gold or silver, which has high economic value and does not corrode.

**Preliminary Economic Assessment (PEA)** – an initial economic study done on a mineral deposit to determine whether or not the project can be profitable under current market conditions.

**Reserve** – a published estimate of the amount of naturally occurring metal, gemstone, or other mineral substance in a 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 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.

**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, including a large number of metal-bearing minerals that are sources for metals such as gold, zinc, and copper. They 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).



Arctic wolf spider, Melville Peninsula. Courtesy of CIRNAC

## GUIDE TO ACRONYMS

<b>CIRNAC</b>	Crown-Indigenous Relations and Northern Affairs Canada
<b>CNGO</b>	Canada-Nunavut Geoscience Office
<b>EDT</b>	Department of Economic Development and Transportation, Government of Nunavut
<b>GN</b>	Government of Nunavut
<b>IOL</b>	Inuit Owned Land
<b>KIM</b>	Kimberlite indicator mineral
<b>MEA</b>	Mineral Exploration Agreement
<b>MPR</b>	Minerals and Petroleum Resources Division, Department of Economic Development and Transportation, Government of Nunavut
<b>NI 43-101</b>	National Instrument 43-101
<b>NIRB</b>	Nunavut Impact Review Board
<b>NTI</b>	Nunavut Tunngavik Incorporated
<b>PEA</b>	Preliminary Economic Assessment
<b>PGE</b>	Platinum-group elements
<b>SEDAR</b>	System for Electronic Document Analysis and Retrieval
<b>VMS</b>	Volcanogenic massive sulphide



Unusual orbicular granite, Mary River project. Courtesy of CIRNAC

Bold project number and name signifies major or advancing project.

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<b>Aston Bay Holdings Ltd.</b>		
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<b>Aura Silver Resources Inc.</b>		
321	Greyhound	36
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Limestone layers exposed in a cliffside on the north coast of Somerset Island. *Courtesy of CIRNAC*

# 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.

