Creating a Prosperous and Inclusive Gemstone Industry in Greenland

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Fair Jewellery Action (FJA) is a human rights and environmental justice network within the jewellery sector. FJA promotes ethical and fair trade jewellery business by advocating traceability and transparency in the jewellery supply chain. FJA's objective is to direct more of the economic contribution of the jewellery sector toward regenerating local economies in small-scale artisan producer communities, as well as supporting their cultural integrity and assuring environmental sustainability.

FJA's activities focus on being a driving force and voice to consumers with the aim of making ethically and fairly traded jewellery the only moral choice. FJA will support jewellers by connecting them with the source of their material and enabling them to see the social, environmental and market advantage of providing ethical products.

FJA does this through three principle action streams: education, campaigning for indigenous peoples affected by mining and producer support of small-scale miners for fairtrade certification purposes.

http://www.fairjewelry.org/

The 16th August Union is a miners association in Greenland. It was founded by local citizens after a group of Inuit collecting ruby on their land were forcibly removed by the Home Rule Government on 16 August 2007, in compliance with the wishes of an international mining company.

Their expulsion from long-standing village property is a violation of Inuit rights as enshrined in tradition and law, and guaranteed in the Constitution. The government is breaking its own laws.

For thousands of years, Greenlanders have gathered stones for hunting and fishing purposes, as building material, for heat and sustenance, for tools and weapons, and, of course, for jewellery. Ruby in particular, has had an artistic and cultural significance for Greenlanders for generations.

Now, the Home Rule Government of Greenland, under the direction of the remnant colonial government in Copenhagen, Denmark, is suppressing the rights of the members of the Greenland Small Miner's Association to work freely and trade in natural occurring ruby.

http://www.freegreenlandruby.com/

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FOREWORD

Over the last twenty years I have been privileged to travel the world as an ethical jeweller. And as a jeweller and Fairtrade campaigner I have met the most amazing people in some of our world's most remote locations: from the jungles of Colombia and its environmental friendly small-scale mining, to the savannahs of east Africa and the efforts of gold miners trying to formalise their production according to Fairtrade standards. I have witnessed the challenges that ordinary men and women face in trying to build a sustainable livelihood from the metals and minerals of the land. It is a challenging job being a miner and it is not helped when policy makers, laws, money and access to the right help and assistance are not there to support you.

But of all the amazing places I have visited, Greenland and its people stand out as the highlight of my ethical journey in jewellery. Its vast panorama of arctic wilderness, stunning mountain landscapes, and it's beautiful people have informed my understanding of the relationship between mineral wealth and local people more than anywhere else I have been to date.

The resources of the land should benefit the people of the land, and the ruby story of Greenland is a living example of this precise point. The opportunity that currently presents itself to the Greenland authorities regarding its gemstone potential could be a global game changer in international gemstone production. This report will highlight the current lost opportunity to the people of Greenland through a mineral law that disenfranchises its people from the wealth of the land. However it does not have to be this way. With courage, the clear minded leadership of the Greenland parliament, accompanied by a simple law change, the people of Greenland could lead the way for the global gemstone community on how to make the most of its gemstone wealth for the majority, not the minority.

There is no doubt in my mind that a Greenland ruby or sapphire presented to the world from the hands of a local Greenlander, is a powerful life changing product. A Greenland ruby or sapphire that enshrines the values of local community, responsible environmental small-scale mining, economic regeneration and human rights will be precisely the kind of gemstone the jewellery industry is looking to get behind. Surely this is what makes a gemstone precious?

The recommendation's in this report of an inclusive gemstone industry that benefits the majority of Greenland's people is achievable. What is now required is for the Greenland parliament to step up to the challenge and create the right legislative environment for this to happen. I remain optimistic that this will come to pass.

GREG VALERIO
Fairtrade and ethical jewellery campaigner & co-founder of Fair Jewellery Action

EXECUTIVE SUMMARY

The Greenland government has an opportunity to show leadership by an inclusive approach to its gemstone industry. Such an approach would ensure that Greenland and its people benefit fully from its gemstone resources.

Our research indicates that mining law reform enabling Greenlanders to mine and sell all types of gemstones, combined with current plans for large-scale mining, would optimise Greenland's resources on an economic, developmental, environmental and community level.

Greenland ruby

To implement such a strategy, we invite Greenland's Bureau of Minerals and Petroleum (BMP) to revise the 2009 Mineral Resources Act and its 2012 amendments, which currently favours large-scale mining as an exclusive solution for commercialising Greenland's minerals.

However, we estimate that revenue from the mining of ruby will be significantly higher using a complimentary approach to exploit rubies and up to ten times more Greenlanders will have gainful employment. Fair Jewellery Action, in partnership with the 16th August Union, proposes the following recommendations to facilitate such a transition:

1. We propose establishing a National Gemstone Export House to collect taxes and tariffs and to record data of all rough and polished gemstones sales. The National Export House will serve to control and monitor export prices in view of maximising export earnings for the benefit of the Greenland people.

2. We propose investing in the development of Greenland's value chain to maximise job creation and capitalise on earnings capacity. We estimate that the gemstone industry in Greenland could employ up to ten times more Greenlanders than current estimates.

3. We recommend that the Greenland government establish a new gemstone policy that enshrines the rights of local Greenlanders to prospect, fabricate and commercialise any gemstone they find that are not gathered from an exclusive mining license.

4. We recommend that the confiscation of mineral property by the Greenland government be reconsidered in light of this report.

INTRODUCTION

The abundance of natural resources in Greenland has attracted the attention of mining companies around the world. For the Greenland nation, the debate now centres on the best strategy to exploit these resources for the benefit of its economy, and its people. Current mining policy favours the exploitation of mineral resources using large-scale mining in conjunction with multinational mining companies. But does this approach maximise Greenland's resources for the benefit of the nation? This report addresses that question.

By analysing the historical developments relating to gemstone mining in Greenland and the planned large-scale mining of ruby at the Aappaluttoq site (in the Fiskenæsset/Qeqertarsuartsiaat region) by the Canadian gem mining company True North Gems, we assess the economic and community benefits and impacts for Greenland. We also ask what role regulation has played in shaping the current context. More importantly, how the law could be used to support an inclusive, productive and vibrant gemstone industry in Greenland.

Greenland ruby in the raw

Our findings suggest a complimentary approach to the exploitation of Greenland's minerals, one that embraces the traditional artisanal mining rights of Greenlanders and large-scale mining will provide the most benefit for the nation of Greenland. To this end, we conclude with nine recommendations that would facilitate institutional support for such an approach. It is our hope that this report will constitute the basis for social innovation in Greenland with a goal to transform its gemstone industry.

METHODOLOGY

Our research involved collecting data in two ways: a review of public information, and direct contact and interviews with Greenland government officials, local Greenlanders who have worked and lived in the Fiskenæsset region, and experts on Greenland ruby. Based on this data, an analysis was done to obtain a better understanding of the advantages and disadvantages of the current gemstone industry strategy in Greenland. This analysis provides the basis for our three-phase proposal for an inclusive gemstone industry in Greenland.

Public Information Review

Our review of public information included:

- Greenland's mining relating legal texts;
- Documents from True North Gem's (TNG) website including press releases, presentations, its Social Impact Assessment and Economic Impact Assessment for the Aappaluttoq deposit, and its pre-feasibility study;
- Communication between BMP and 16th August Union members and external actors such as the International Coloured Stone Association;
- TV reports and newspaper articles.

16th August Union member submitting protest letter to BMP

Direct Contact with Key Stakeholders

The second part of the research was a series of meetings and semi-structured interviews to confirm publicly collected data. These interviews also served to deepen the understanding of the evolution of ruby mining in Greenland.

To do so, we contacted/met with members of the 16th August Union, Greenland government officials and civil servants within BMP, representatives of civil society including the Inuit Circumpolar Council and the Employers' Union, and academics based at the University of Greenland.

Limitations

Like all methodologies, there are limitations, and the lack of data is one. As there is no fully operational gemstone mine in Greenland, it is extremely difficult to locate supporting documentation about mining companies. Data of this type would be useful for comparative analysis. We have used data from TNG, as to our knowledge, there is no other data on a gemstone mining company operating in Greenland publicly available. This highlights a second limitation of this report, the accuracy of data provided by TNG. Therefore, the calculations in this report are only indicative and require deeper analysis that incorporates data from independent sources.

GEMSTONE MINING IN GREENLAND

There is a long Greenlandic tradition of collecting gems and precious stones, with many households choosing to put their collection on display.[1] Prior to 2007 there was little government objection to Greenlanders commercialising their collections and if anything, it was actively encouraged. Furthermore the legal framework supported it and it is to the evolution of mining regulation in Greenland that we turn to now.

Gemstones – A Greenland Tradition Enshrined in Law

Under the 1999 Mineral Resources Act of Greenland, export licenses were issued permitting Greenlanders to take rubies to tradeshows around the world. The Greenland Stone Club was regularly issued export licenses in the hope that the quality of Greenland rubies would garner external commercial interest.[2]

Such is the quality of Greenland ruby that it eventually attracted the interest of True North Gems, a Canadian gem mining company based in Vancouver, who conducted the first valuation of ruby from the Aappaluttoq deposit.[3] Using information provided by the Geological Survey of Denmark and Greenland (GEUS) and Fiskenæsset locals knowledgeable in the location of ruby, TNG collected a 15 tonne ruby 'mini-bulk' sample from its 110km2 exploration licence area in the Fiskenæsset region, of which the Aappaluttoq deposit is a part.[4] This preliminary exploration was carried out under the supervision of the Chief Operating Officer, William Rohtert, a respected economic geologist and gemmologist.[5]

Fifty one kilogrammes of gem and near-gem commercial quality ruby and pink sapphire was recovered from the sample.[6] This find prompted True North Gems in 2006 to continue their exploration into the region and invest a further $1.1 million into the project.[7]

During this initial exploration period the local population was assured by TNG and BMP that they would be able to continue collecting and selling ruby from the area, as they had done for generations. On 7 July 2005, Ms Anette Jorgensen, a BMP section head, confirmed during a meeting with Fiskenæsset locals that under Section 32 of the 1999 Mineral Resources Act of Greenland (see Appendix 1.), they had the right to collect ruby of any quality from TNG's exploration licence area.[8] If Greenlanders were employees of TNG, the same rules applied so long as the collection was done outside of work hours. She additionally reassured them that they could continue to manufacture jewellery products and sell it to whomever they please.[9]

Ms Anette Jorgensen and Inuktitut translator Mr Johannes Kyed address the Fiskenæsset community guaranteeing ruby mining rights

In 2006, NUUK TV reported on TNG sponsored gem cutting, polishing and design courses (as well as other gemstone related initiatives) to teach the local population about gemstones. According to NUUK TV and Mr William Rohtert who organised funding for the courses, the aim of these courses was to increase employment opportunities and to fully realise the market potential of the local population's personal gem collections.[10]

Local children being taught how to identify and sort gemstones

A Change in Policy

TNG continued its sampling of ruby throughout 2006 extracting another 30 tonne bulk sample. Mr William Rohtert evaluated 37 gemstones from the sample and the valuations were published 18 January 2007.[11] The table below summarises the valuation:

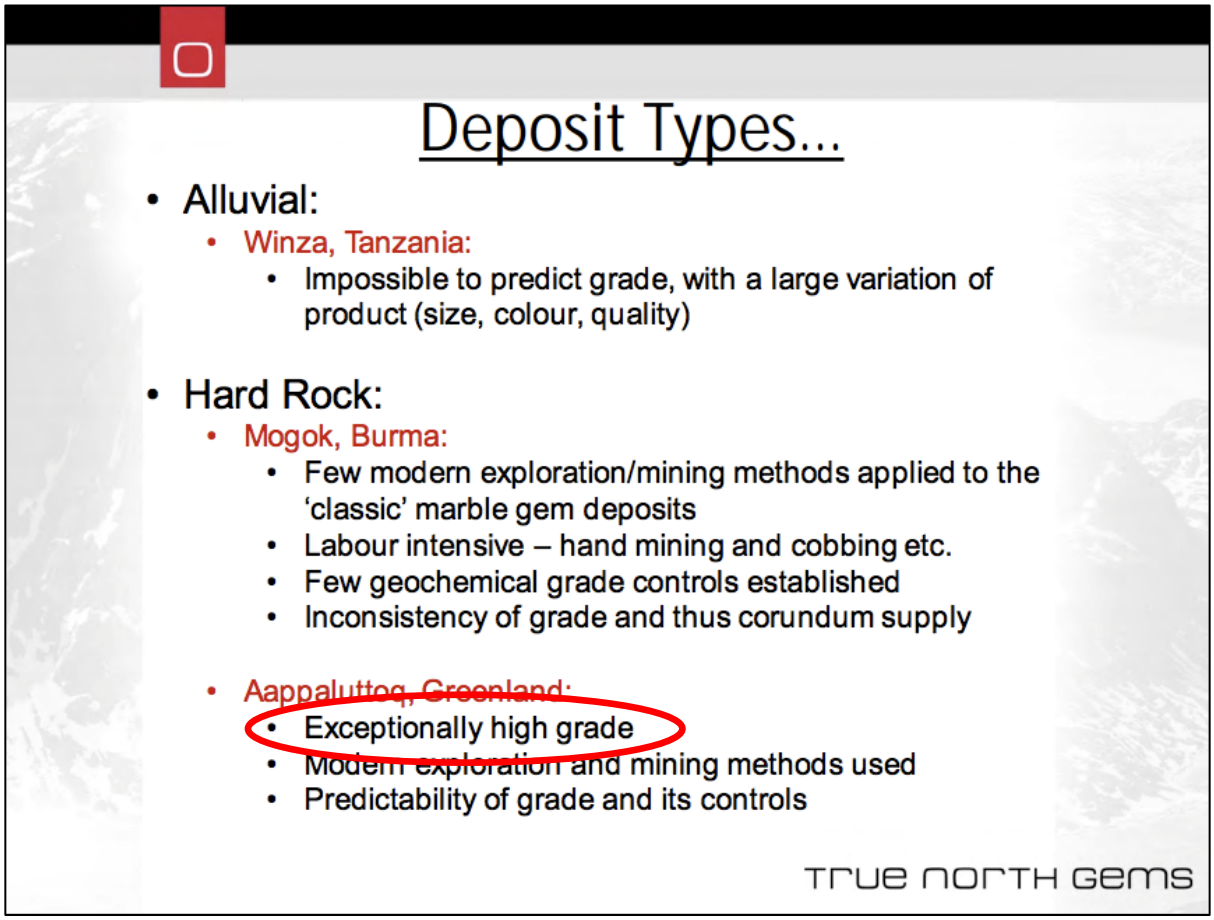
Ruby and Pink Sapphire Valuations

Material	Size Range (Carats)	Wholesale Price Range (US$ per Carat)	Average Price per Carate (US$ Wholesale)
Ruby	0.23 - 5.70	$410 - $3,220	$950
Pink Sapphire	0.27 - 2.51	$60 - $460	$285

Following this release, in February 2007, Mr Rohtert was replaced as project manager by TNG's Vice President, Mr Greg Davison.[12] In conjunction with the new appointment, TNG released a second valuation of gemstones taken from the same sample. The price and carat values were decidedly lower.[13] The table below summarises the valuation.

Material	Size Range (Carats)	Price Range (per Carat)	Average Price (per Carat)	Total Value
Ruby Faceted	0.11-1.54	$25-$500	$77	$7,427
Pink Sapphire Faceted	0.06-1.60	$20-$300	$73	$3,535
Ruby Cabochon		$30-$50	$36	$5,371
Pink Sapphire Cabochon		$30-$65	$44	$667
			Total	$16,940

Two comparable value estimates were released in 2008 but to our knowledge, there has been no official explanation of the difference between Mr Rohtert's initial valuation and the subsequent lower estimates. We highlight this as the predicted revenue estimates for the mine were based on an average ruby/sapphire price using the lower valuations.[14] We also note that TNG considers the ruby at the Aappaluttoq site to be "Exceptionally High Grade" (see below) so the reasoning behind using the lower valuations is ambiguous.[15] See the section 'Tax Revenue' for more details on this issue.



The change in leadership resulted in a shift in project objectives. The gemstone cutting and polishing courses were discontinued and the Fiskenæsset residents were informed, in spite of earlier assurances from BMP, that they were no longer allowed to prospect for ruby from TNG's *exploration* area (the 1999 Minerals Resources Act in effect at the time only exempted Greenlanders from collecting gemstones from *exploitation* sites for which TNG did not have a licence), which now encompassed an additional 713 km2 of land around the village of Fiskenæsset.[16]

BMP also stopped issuing export licenses to Greenlanders attempting to export gemstones, including those that had previously had little problem obtaining them. The Greenland Stone Club has subsequently been forced to close.

In the summer of 2007, Mr Niels Madsen, a Greenlander and former TNG employee, attempted to obtain an export license for ruby that he had been encouraged to collect in his free time. BMP repeatedly delayed his application.[17] Later in the year he took a large collection of his stones to BMP and asked them to sign off on an export license. BMP turned down his request, stating that the stones were too valuable to export (despite no value based limit under the 1999 Minerals Resources Act in effect at the time), contradicting earlier assurances made during the 7 July 2005 town meeting in Fiskenæsset.

BMP informed Mr Madsen that the legislation in effect at the time only applied to 'semi-precious' stones. However, the term 'semi-precious' is not an internationally recognised term, and there is no reference in the 1999 Mineral Resources Act to the terminology 'semi-precious'.[18]

This led Mr Madsen, Mr Christian de Renouard and Mr Thue Noahsen (all resident Greenlanders) to ask their friend, and former TNG employee, William Rohtert, to take a selection of their rubies out of Greenland in order to have them independently valued and to procure international certification of ownership. Legally foreigners were permitted to take a 'handful' of gemstones out of the country without a license, yet, on 2 August 2007, Mr Rohtert was detained by the police at the request of BMP, accused of being a ruby smuggler.[19] Mr Madsen's apartment was then searched in connection with Mr Rohtert's detainment.

Ruby confiscated from Mr William Rohtert

The Greenland police required clarification as to why they had been asked to detain Mr Rohtert. They later sent a letter to BMP asking them exactly what laws had been violated. BMP replied that the ruby had been collected in a systematic and professional way, led by Mr Rohtert.[20] Mr Madsen, Mr de Renouard and Mr Noahsen were also charged.[21] (See Box 1. below: The Human Impact – The Case of Thua Naohsen.)

BMP proposed an out-out-court settlement: in exchange for an admission of guilt, the accused would be fined 5000 DKR.[22] Convinced that they had done nothing wrong, and fearful that accepting the offer would set a legal precedent, the settlement was refused in the hope that a court would eventually clear their names.

Six years later, the case has still not gone to trial, there has been no partial hearing (as required by law), and the ruby has not been returned to its owners.

Founding of 16th August Union

Tensions between TNG and artisanal miners escalated on 16 August 2007 when Mr Madsen and a number of other Greenlanders were expelled from one of TNG's exploration sites by three armed police and BMP.

The locals were prospecting at the Aappaluttoq site on 14 August when they were approached by a TNG employee, who stated that they were not allowed to be there. They informed her that Greenland law did in fact allow them to be there, as TNG did not posses an exploitation license for the site.

Two days later, on 16 August, a helicopter arrived with two armed police, Anette Jørgensen (of BMP) and Greg Davison (of TNG). Anette Jørgensen claimed that there had never been a policy allowing locals to prospect for ruby for commercial gain (despite her assurances at the 2005 town meeting in Fiskenæsset). Mr Madsen was subsequently banned from selling or collecting any gemstone in Greenland.

BMP were subsequently contacted by the International Coloured Gemstone Association expressing concern over the suppression of native mining rights. It offered to help establish a more inclusive national gemstone policy but this offer was ignored.[23]

In 2009, the Greenland Ombudsman in its official capacity reviewed the case ruling that BMP had overstepped its remit in its handling of this issue.[24]

When questioned on the issue TNG's founder, Andrew Lee Smith, said that he is supportive of small-scale mining and selling of rubies by Greenlanders, so long as it is lawful.[25] As there was no law forbidding the collection of ruby as of 16 August 2007, the removal of Mr Madsen and other miners represented an infringement of their rights.

Following their exclusion from the site, the miners created the 16th August Union in an attempt to draw national and international attention to the issue and pressure BMP to acknowledge native mining rights. A petition supporting their cause garnered over 3500 signatures, around 4.5% of the Greenland population, in less than three weeks. The 16th August Union hoped to use this support to ensure that the new mineral act, being drafted in alignment with the onset of Greenlandic home rule in 2009, would bring clarity and fully manifest their natural right to mine and sell in law.

In June 2009 the 16th August Union and Greg Valerio, co-founder of Fair Jewellery Action, questioned BMP on their institutional experience in drafting effective small-scale laws and were offered a discount rate for a lawyer who specialised in the drafting of small-scale mineral policy. BMP acknowledged its inexperience in matters relating to small-scale mining and initially accepted help, but changed its position and proceeded to draft the law without any specific knowledge, of gemstones or small-scale mining issues. Appendix two details the legal requirements for artisanal mining under Greenland's 2009 Mineral Resources Act.

Box 1: The Human Impact - The Case of Thue Noahsen

Thue Noahsen

On 29 March 2007, Greenlander Mr Thue Noahsen was issued an export license by BMP in view to sell 5kg of ruby from the Fiskenæsset region to a goldsmith in Denmark.[26] A follow-up letter, sent to Mr Noahsen two months later, stipulated that the license did not in-fact apply to ruby collected with commercial intent from TNG's *exploration area* in the Fiskenæsset region.[27] There was no legal basis for the reasons in the letter under the Mineral Resources Act in effect at the time.

Following the events of 16 August 2007, Mr Noahsen (who was working for TNG on its site at the time of the incident) was gradually forced out of employment after allegedly refusing to sell his export license to TNG's Greg Davison. This resulted in a loss of income and the subsequent loss of his home.

In a desperate attempt to generate income and under the conditions of his original export license, Mr Noahsen tried to take 5kg of ruby out of the country to sell in Denmark. At the direction of BMP the Greenland police confiscated his ruby whilst he was sitting on the plane waiting to leave Greenland. He was widely condemned as a Ruby smuggler by BMP and national press[28]

Six years later, the case still has not gone to court and Mr Noahsen has not had his ruby returned to him.

QUESTIONS RELATING TO THE BENEITS OF LARGE-SCALE MINING IN GREENLAND

The 2009 Mineral Resources Act and subsequent 2012 amendments have created a legal framework that values large-scale mining preferentially over other forms of mining. This precedent is based on the assumption that large-scale mining will be the best source of tax revenue and employment opportunities. As Ms Kim Kielsen, Greenland's former Minister of Minerals and Petroleum states,

> **"A part of this strategy is to secure the Greenlandic society as a whole benefits from its natural resources and not leaving potential gains to a few"** [29]

But the question remains, is this claim tenable? Using True North Gem's 2011 pre-feasibility study, we assess here projections of revenue and job creation.[30]

Tax Revenue

The TNG mine in Aappaluttoq is expected to contribute to the Greenland economy through two forms of taxation: corporate tax through TNG's Greenland subsidiary, True North Gems Greenland A/S, and personal income tax. There will also be other indirect benefits from the purchase of internally sourced materials and employees spending their income in Greenland.

TNG estimates that it will pay between $15-16 CAD million in corporate tax over the course of their operation in Aappaluttoq, 5% of which it has offered to pay upfront (this would be deductible from future tax payments). In addition; it predicts that the government will receive between $1.1 (DKr6 million) and $2.2 million (DRk12 million) a year in income tax payments.

Based on our calculations, the broad income tax figures do not raise cause for concern, however we believe that the corporate tax revenue may require greater scrutiny.[31]

First, all monetary estimates in TNG's pre-feasibility report were calculated based on the assumption that 100% of the ruby and 60% of the sapphire collected would be sold from Greenland in its final polished state (with the remaining 40% of sapphire being sold as rough).[32]

At the time of writing Greenland does not have the industrial capacity or trained workforce necessary to carry out cutting and polishing on a scale of such magnitude (the mine will produce an estimated 162 kilo tonnes of ore over the course of its lifetime).

Second, it is unclear how TNG intends to go about commercialising its production, which is key in estimating tax revenue. For instance, TNG's initial preference in its pre-feasibility study to commercialise polished stones is not stated as clearly in its 2013 Social Impact Assessment (SIA) report. The SIA states:

> "The general marketing strategy proposed is to introduce the rubies and sapphires from Aappaluttoq to the market as follows:
>
> - Introduction to the market: sale of polished rubies and pink sapphires, starting 2012-13. The purpose of these polished sales is as a form of advertising to show the gemstone market that Greenlandic rough rubies and pink sapphires can be polished and transformed into a high quality product;
> - Increase of sales of rough rubies and pink sapphires, following the increasing demand and price of rough gemstones once the market becomes acquainted with the Greenlandic gemstones;
> - Majority of sales as rough rubies and pink sapphires once the price is high enough. It is intended that a percentage of sales will be from polished gemstones, depending partly upon the extent to which jewellery wholesalers and retailers will wish to purchase polished gemstones directly from TNG to be absolutely certain of the origin of the gemstones and certain that the gemstones have not undergone any undisclosed treatments."

So while the sales and marketing strategy does include polished stones in the initial stages, there is a preference for rough. The report goes on to state that,

> "Polishing and marketing entails high costs, without necessarily resulting in increased prices for polished gemstones that overcomes these costs (the cost of polishing ranges from $0.20 to several dollars per piece polished). In the diamond industry, rough diamond prices are very close to polished diamond prices. Similarly, once the price of rough gemstones is high enough, selling the majority of the production as rough will result in greater profitability (and subsequently result in the payment of more taxes in Greenland) than if TNG attempts to undertake polishing and marketing."[33]

If a clear assessment of the tax revenue generated by TNG's activities is to be determined, it is in the interest of BMP to request a coherent market strategy. Below we provide some sample calculations to illustrate the difference in value between rough and polished ruby using figures from TNG's pre-feasibility study.

Rough vs Polished

The average price of ruby used to calculate TNG's economic estimates is as follows:

Rough Ruby Value: **$0.39 per gram**
Polished Ruby Value: **$161.7 per gram**[34]

TNG then factor in a 9.3% cutting/polishing retention rate (meaning that only 9.3% of the rough gemstone will remain once the cutting and polishing process has occurred).

For example, the ruby rough pictured, weighs 81.64 grammes. Assuming it is of gem quality this would mean (according to TNG's pricing estimates) that it is worth approximately **$31.84**.[35] However, if the stone were to be polished, taking into account the 9.3% retention rate, it would be worth **$1227.71.** The polishing cost for this stone (again using only estimates provided by TNG), would be approximately **$44.80**. This leaves a final value of **$1,182.91.**[36]

Greenland ruby rough

The difference in value between the final polished stone and the initial rough stone is $1,151.07.

Furthermore, for a stone of this size, if the gem quality is exceptional, the final price would dwarf the price estimated here.

What these calculations highlight is that if TNG were to export the gem material as rough, even to an international subsidiary (See Box 2 : Transfer Pricing), the revenue and subsequent profit made in Greenland would be significantly lower. This would lead to far less corporate tax being paid than currently estimated.

In order to calculate more precisely what percentage of the ruby/sapphire would have to be exported from Greenland as polished product in order for TNG to pay corporate tax, we remodelled their financial projections for the mine (taking into account the variable costs of marketing and polishing). The results of the remodelling are in Appendix 3 and we detail here our interpretation of the results.

- If True North were to export all of the rubies/sapphires from Greenland in a rough state they would, according to our estimates, pay **no corporate tax** in Greenland over the entire lifetime of the mine.
- The Greenland mine would in fact be operating at a total loss of around **$121 million**.
- We estimate that TNG would only pay corporate tax in Greenland if they were to export a minimum average of 42% of rubies and sapphire from Greenland in their final polished state.

In reality, we do not predict that the mine would run at such a loss. One, because this would be unsustainable (they wouldn't be able to pay employee wages), two, because it is possible for them to transfers certain expenses onto the books of other TNG subsidiaries, potentially increasing profits margins in Greenland, and three, because TNG has decided to use a very conservative estimate for the pricing of the rough (as noted earlier in this report). However, our calculations illustrate that more information is currently needed to accurately determine how a large-scale mining operation will be of benefit for Greenland.

Employment

The SIA predicts that TNG's Greenland operation will initially (in the construction phase) employ 40 – 50 people, of which 75% are predicted to be Greenland nationals. During the operation phase the aim is to employ 60 – 80 people, of which 95% will be Greenlanders within 4-5 years of the project start date. This depends on training, of which there are course proposals at the Greenland School of Minerals and Petroleum as well as on the job training and internships. TNG proposes that the most likely scenario is that the project will mainly attract workers already employed in other sectors. There will of course be further secondary employment opportunities created in order to fulfil transport, supply provision and security needs.

These extra jobs will benefit the Greenland people so long as the openings are actually filled by Greenlanders. However, it is in the labour intensive industry of cutting and polishing that the true employment potential could be realised. TNG have already indicated that this process will be carried out in Asia (most likely in Thailand) and not in Greenland, but opportunities exist to develop this locally.[37]

Box 2: Transfer Pricing

An arms length transaction would imply that the transfer price be the same as that of an equivalent transaction made between two unrelated parties. In practice this is very difficult to enforce.

In the case of TNG, the transfer price of the rough ruby being exported from Greenland would be paid by the TNG subsidiary in the country that is doing the polishing (or potentially an offshore intermediary). In regards to the arms length ruling, there are really no equivalent trades on which to base the transaction price, so the government is in the unfortunate position of either accepting TNG's valuation or commissioning their own. Currently, the number of valuations is small, potentially creating price distortions.

The creation of a localised small-scale gemstone industry would likely provide some degree of equivalence (as the government would be able to compare the sale price from other producers), which would allow the Greenland government to implement steps towards ensuring the correct transfer price is being paid.

TNG's ruby and pink sapphire fact sheet states,

> "… there is a large, ready workforce with the required training and skills for cutting gemstones. Depending on the ultimate size of the mine, the polishing of all ruby material to be produced from Aappaluttoq could take *several hundred (even thousands) of full-time polishers*."[38][Emphasis added]

In light of TNG's assessment of the polishing market, Greenland's capacity to earn revenue remains a political decision. Greenland's current industrial capacity will lead to the majority of the gemstones value being realised offshore, along with the high number of jobs associated with cutting and polishing that creates added value. This is not to say that large-scale operations such as the one examined here have no positive role to play in regards to extracting Greenland's gemstone resources. Our aim is simply to highlight that the assumption underlying current government policy, namely that large-scale operations will bring in higher tax revenues and create more jobs, is questionable at best.

MOVING TOWARDS AN INCLUSIVE GEMSTONE INDUSTRY

So if questions remain about the benefits of large-scale mining in Greenland, what other options are there? We propose that reinstating personal mining rights will go someway towards addressing some of the skill-set and capacity deficits alluded to in the previous section. This will also bring in additional income (both personal and governmental) whilst providing significant employment opportunities.

As small-scale miners produce about 85% of the world's coloured gemstones, large-scale mining is not the only option available to extract Greenland's gemstone resource.[39] Furthermore, the reason that small-scale is responsible for the majority of the world's gemstone production is primarily because it is rare to find a single deposit large enough to justify the expense of starting up an industrial large-scale mining operation.

Artisanal mining requires minimal equipment

In this regard Greenland is no different. Despite an ever-increasing number of known ruby deposits throughout the Fiskenæsset/Qeqertarsuatsiaat region, very few will contain gemstone deposits of a high enough concentration, yield and grade to justify an industrial operation. The fact one site has already been identified does not mean that all sites are suitable for industrialisation.

Therefore, in order for Greenland to reap the full benefit of its gemstone resources both large-scale and small-scale approaches need to be considered. Large-scale mining is not profitable in many cases due to the large investment in infrastructure necessary to operate a mine. Furthermore small-scale mining also provides greater employment opportunities. According to the International Institute for Environment and Development (IIED), small-scale mining provides employment for ten times as many people worldwide than large-scale.[40]

We conservatively estimate that an inclusive Greenlandic gemstone policy, which actively encouraged personal and small-scale operations, could eventually create around 600 jobs (fulltime, part-time and subsistence) in the primary and secondary gemstone sector.[41] In a country with a population of 56,370 people this represents over 1% of the population.

Importantly, these jobs would be largely decentralised, favouring those in the villages closest to the deposits, thus providing opportunities for people to earn a living without having to migrate to larger towns. We see five other advantages of investing in small-scale mining in Greenland, which are detailed below.

Advantage 1: Stimulates Internal Demand

The potential earnings for Greenlanders that mine and sell gemstones are vast. A notable advantage of allowing native Greenlanders to directly benefit monetarily is that not only will this increase individual income, the money brought into the country through the sale of gemstones will also most likely be spent in the country. This will serve to stimulate local demand and promote spill-over growth in other industries. In contrast, for large-scale multinational operations, apart from obligatory wages, local running costs and taxes, revenue created through the sale of the gemstones would result in capital flight for the benefit of investors.

Advantage 2: Environmental Responsibility

There are environmental benefits to smaller-scale operations. Greenland law currently only allows for extraction to be carried out using small, handheld tools such as hammers, chisels, crowbars and pickaxes (no mechanical tools). Whilst mining is in itself unsustainable because it is not renewable, no explosives or chemicals can be are used by small-scale miners in Greenland, which makes small-scale gem mining decidedly less damaging than large-scale mining counterparts.

Advantage 3: Traceability

In regards to demand, the notion that a gemstone can be traced to the individual miner who collected it carries with it a premium, allowing jewellers to sell gemstone for a higher margin than a non-traceable gemstone. International jewellers we spoke to indicated that the idea of buying Greenland gemstone directly from Greenlanders, which is free of many of the ethical hurdles associated with gem mining (war and bonded labour), would be very appealing indeed.

Advantage 4: Low start-up costs

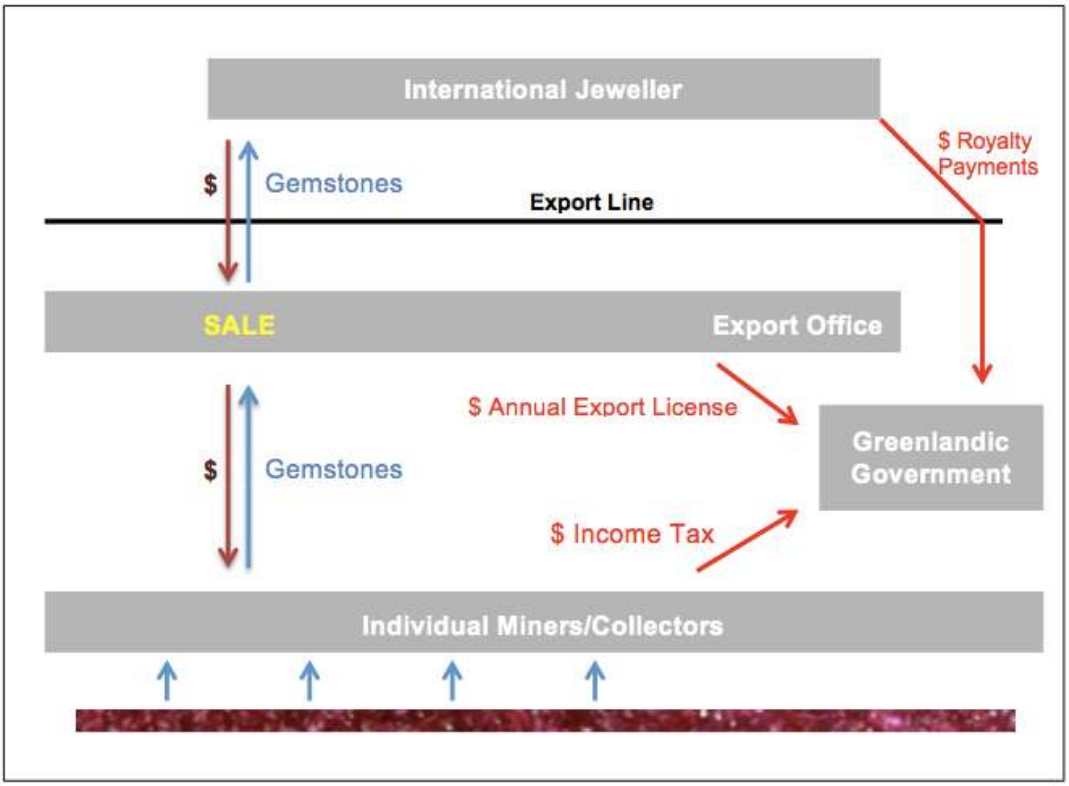
As a final point, the actual start up cost associated with small-scale/individual mining is minimal; transport to the site and the purchase of a few tools is all that is required. This means that it does not require a high number sales before the individual is making a profit and the government is receiving revenue.

Advantage 5: Financial Accountability

One of the key questions we encountered when talking to Greenlandic government officials was, “how do we ensure accountability and make sure that tax revenue is collected on the sale of gemstones by individuals?” This is a valid concern but with the appropriate institutional support, small-scale mining would have an important role to play in facilitating financial accountability in the gemstone sector. As such, we propose the following three-phase approach as a way of operationalising financial accountability in the gemstone sector in Greenland.

Phase 1

Phase one would involve reinstating unrestricted personal mining rights to Greenlanders and the creation of an Export Office, in which all gemstone sales must be registered. This is a simple process and has proven to be successful in countries such as Sri Lanka.[42]



Diagrammatic representation of phase 1

Ensuring that all domestic and foreign sales are registered at the Export Office provides accountability and traceability that in-turn allows the government to monitor sales and collect tax revenue. The Export Office would also provide a degree of regulation, in that it could suspend mining rights for anyone discovered to be breaking the law (eg. using environmentally destructive mining techniques or stealing from exclusive license areas).

An additional benefit of ensuring that all gemstone exports (including those of large-scale operations) are registered at the export house is that it allows the government to monitor and compare the transfer prices being paid. This goes someway towards overcoming the risk of artificially low transfer prices.

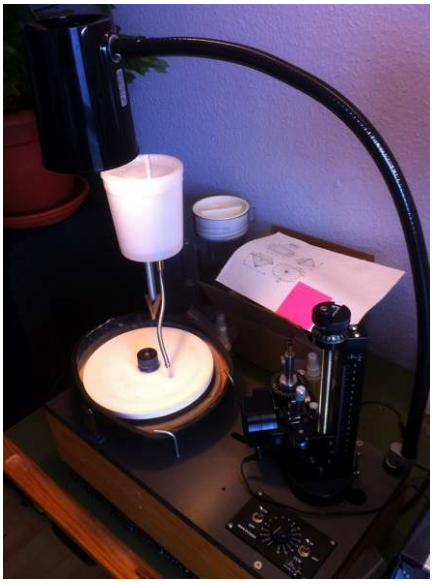
Under this model the government would receive income from three sources:

1. Income tax payable by those collecting and selling gemstones. At a marginal tax rate of 42% this is a significantly higher rate than corporate tax. All sales would have to be registered at the export office, ensuring that the correct amount of tax paid is an attainable objective.
2. If, as expected, the government introduce a royalty payment on the export of gemstones, this would result in another stream of government revenue, payable by the international buyers.
3. An Export Office will have to be established and managed/licensed by government. Over time, the private sector could have a role in managing the Export Office. In this case, the private sector organisation would be asked to pay a license fee to the government in exchange for the right to export gemstones (this could be at either a fixed rate or based on sales). The Export Office would generate revenue by charging a fee for its services.

Phase 2

A strategic approach to phase one will lead to the development of secondary industries. Such industries would include cutting/polishing workshops, gemstone traders, final product jewellery designers and valuation houses. Greenland has already seen something similar happen in the bone carving industry, where artisans often buy bones from hunters and then carve them into jewellery, either at home or at public facilities such as the Public Carving Centre in Nuuk.

Based upon our conversations with local miners, the same people collecting the gemstones may also cut, polish and trade, but it is equally likely that individuals may prefer a specialisation within the value chain. This will create additional employment across the gemstone industry in Greenland.

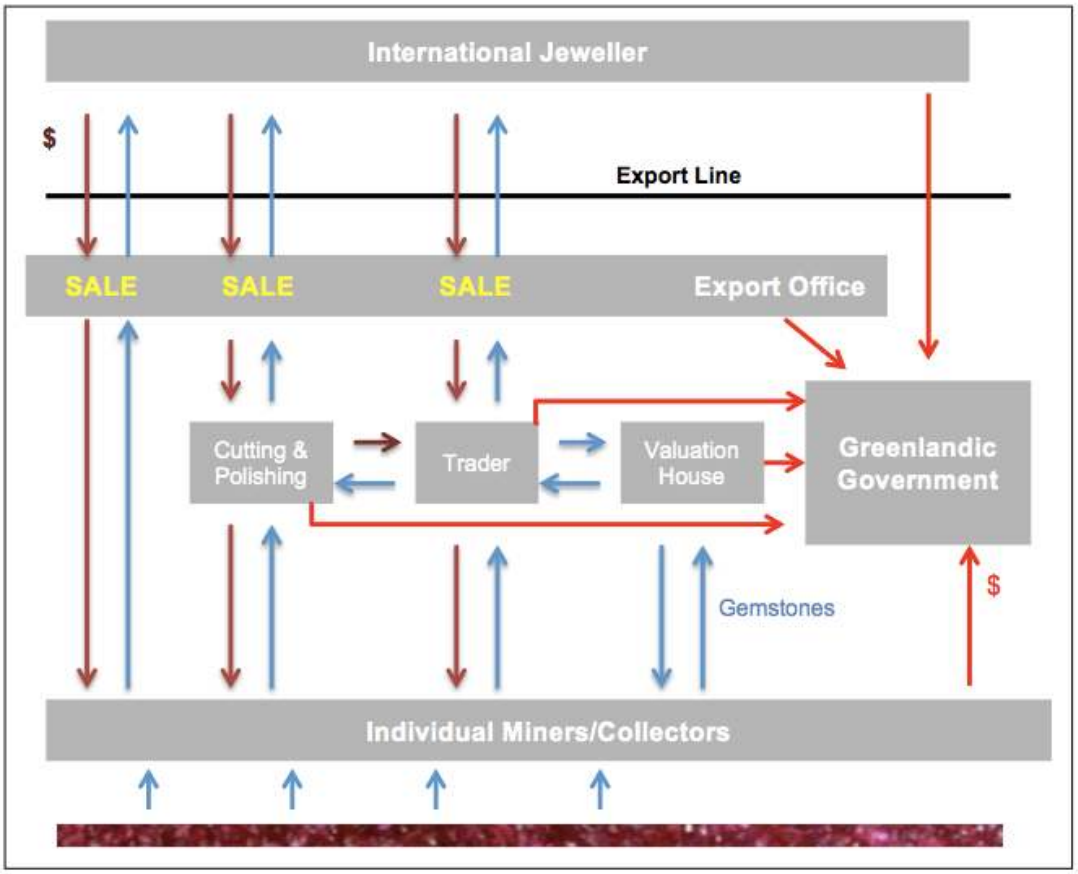


A gem faceting machine, owned by a resident of Nuuk

Due to TNG's initial courses to develop local capacity in gemstone identification and transformation, there is already a core group of people with cutting and polishing skills. Furthermore, courses are available at the Nuuk municipality college. Many of the 16th August Union members are already trained; part of the Union's expressed agenda is to provide free courses for the public in the future. The Union also plans to make some of these courses available in the Greenlandic language over the Internet, so that people in the villages will be able to access the information.

These strategic developments will lead to the government collecting higher tax revenue as Greenlanders begin to sell their gemstones at a price closer to the final market value. The

development of Greenland's cutting and polishing industry will additionally serve to increase the country's overall capacity to benefit from large-scale gemstone operations in the future.



Diagrammatic representation of phase 2

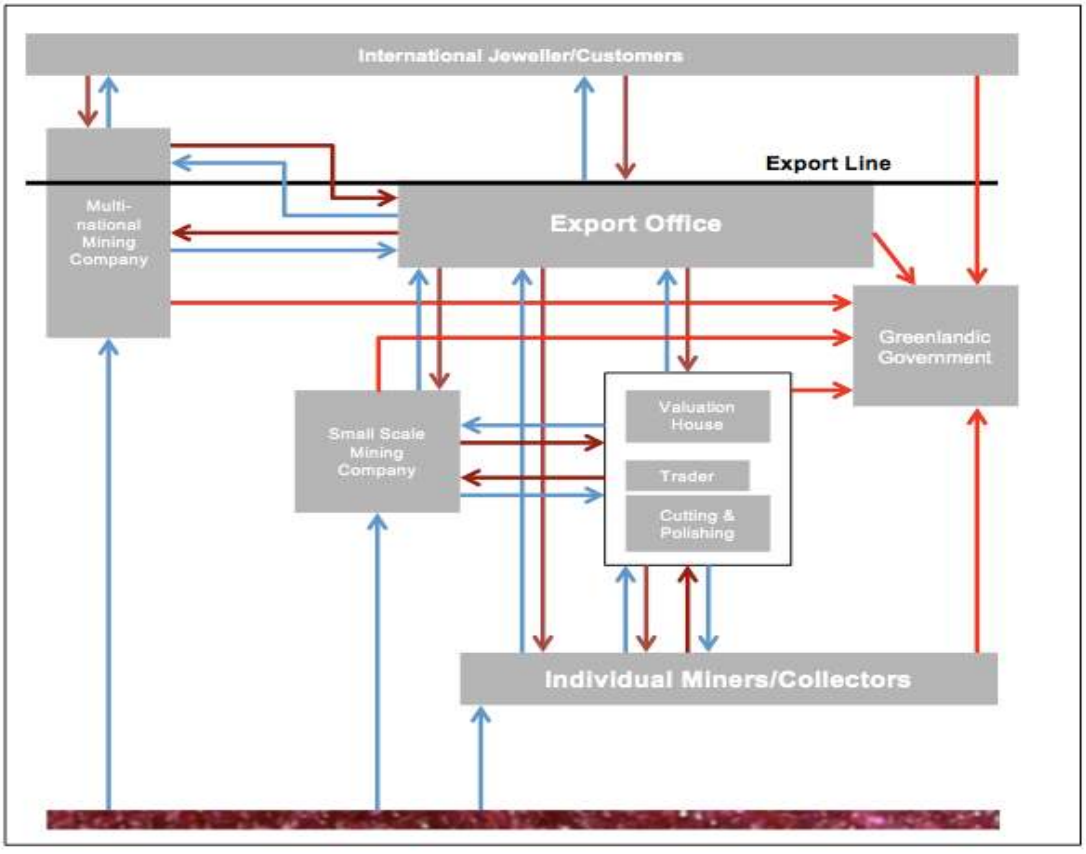
Not all Greenlanders will want to undertake the arduous task of mining gemstones. It is likely that some people will act as intermediaries between miners and buyers. Such a development would not impact the obligation to pay income tax on any earnings and the government will have recourse to export house statistics, providing transparency and ensuring that the government is able to capture a proportion of the value in the form of tax and royalty payments.

A third industry that is likely to arise is that of gem valuation. Gem pricing can be subjective and in order to ensure both parties obtain a fair price, it is often useful to have a third party valuation on which to base the asking price. This is something that will develop with greater awareness of the value of gemstones. Furthermore, as gemstone industries develop within a country, technical support can be provided by organisations such as the America Gem Society when they open offices in a country. This is also another potential source of revenue.

Phase 3

Phase three would see some of the individuals involved in the collection/sale of gemstones forming cooperatives and small companies in order to take advantage of the lower tax rates and exclusive rights to certain areas. These collective organisations would be required to adhere to Greenland's small-scale mining legislation.

One of the queries we have encountered when presenting this idea revolves around the notion that people may try and circumnavigate this process and smuggle stones out of the country. The solution to this issue is straightforward: local testimony confirms that this is already happening as no legal avenues exist for gemstone sales and exportation. Providing a legal framework gives these people the opportunity to contribute to the Greenland economy, which in-turn allows the government to capture the value. There is also a large discount associated with the sale of smuggled goods, to account for the risk involved in the sale of illegal gemstones. That is, an appropriate legal framework would facilitate higher gemstone prices, and hence generate greater revenue.



Diagrammatic representation of phase 3

This process would not replace large-scale gem mining operations, which would still have a role within Greenland's economic strategy. The process would simply be diversified, benefiting the people of Greenland and the Greenlandic economy as a whole. This represents on opportunity for the Greenland government to develop an inclusive, efficient and prosperous economy, without excessive costs to begin the process.

Recommendations

1. Reinstate the legal right of Greenlanders to commercially collect, mine and sell *all* gemstones (without exception) and remove the annual upper limit of DK 100,000. The limit discourages Greenlanders from creating businesses.
2. Commission a full social and financial feasibility study on the creation of a Greenlandic Gemstone industry. The study should act as the foundation for the implementation of phase one and two of a new gemstone economy in Greenland.
3. Establish a National Gemstone Export House, with authority to assess taxes and tariffs, and to record data, for all gemstones sales, both rough and polished. The National Export House would ensure that gemstone value is fairly priced and serve to control and monitor export prices in view of maximising export earnings for the benefit of the Greenland people.
4. Remove restrictions on Greenland residents collecting from *exploration* license areas. As mentioned, excluding Greenlanders from entire regions has no discernible benefit to the Greenland economy/people.
5. Fix the price when applying for a small-scale mining license. The current model allows BMP to set the fee price at its discretion and requires better transparency.
6. Return gemstone mineral property that was erroneously confiscated by the Greenland government to the rightful owners.
7. Audit relations between BMP and TNG and its actions over the past six years.
8. Facilitate measures designed to increase and improve dialogue between BMP, large-scale mining operations, and small-scale mining actors. Presently, policy supports large-scale mining companies to the detriment of all other parties.
9. Verify independently the discrepancies in the valuations of Greenland ruby.

Greenland ruby - a potential source of prosperity for all Greenlanders

CONCLUSION

The beauty of jewellery has embodied a rich variety of meanings for millennia. In our contemporary times, jewellery is often a part of special occasions that celebrate life and symbolise love, and thus represents moments in life with very deep meaning.

In July 2011, Fair Jewellery Action (FJA) co-published the report *Uplifting the Earth,* which documented a new vision for excellence for the jewellery industry.[43] Central to the vision was the increased awareness of consumers on social and environmental issues: consumers no longer want to take the risk that the symbolism of jewellery could be tainted by a social issue such as child labour being used in the supply chain or the taking away of indigenous rights, or an environmental issue. This deeper awareness has created the expectation that consumers want a deeper meaning from their jewellery. The report concluded with an invitation to jewellery brands to embrace that vision by asking the question how the jewellery value chain can maximise benefit for the most people possible.

This vision, and the invitation to be a part of it, is not limited to corporations. It *is* possible for government to lead by example and create inclusive systems that benefit as many people as possible. This is the crossroads that the Greenland government is at.

Presently, the government of Greenland is seeking a solution to mine and commercialise its mineral resources, and potentially develop its precious stone industry. Its preferred solution is a large-scale mining approach. However, based on the available documentation, it is questionable whether large-scale mining is the only solution to exploit Greenland's resources. Our research indicates that tax revenue and employment opportunities would be much greater using a complimentary approach that embraces small-scale mining as well as large-scale mining.

This means that the Greenland government needs to reconsider how a complimentary approach can be incorporated at a policy level and embodied in law. At a policy level, this would require reformulating current texts so that Greenlanders are understood as active participants in developing Greenland's future gemstone industry. An inclusive approach such as this would demonstrate the government's commitment to its people and social progress.

On a regulatory level, an initial step will be to reinstate the personal rights of Greenlanders to collect and commercialise precious stones. On a strategic level, we propose a three-phase plan to assist the implementation of an inclusive gemstone industry in Greenland. A funded feasibility study that addresses the financial, social and operational aspects of the proposal would help determine how such a strategy could be undertaken. FJA is well positioned to conduct such a study, and it is our hope that this report will not only form the basis of a dialogue with the Greenland government in developing a prosperous and inclusive gemstone industry, but deepen the meaning of jewellery for future generations in Greenland and around the world.

APPENDIX 1: Section 32 of the 1999 Mineral Resources Act of Greenland

Section 32 states:

The resident population of Greenland may as hitherto collect and extract mineral resources without this requiring a license under this Act.

Subsection 2.

The right under subsection 1 (*above*) to collect and extract mineral resources can, however, only be exercised with respect of exclusive licenses for exploitation of mineral resources granted to others under this Act.

Subsection 3.

Within the precincts of a municipality, the local council may lay down detailed rules of the exercise of the right under subsection 1 to collect and extract mineral resources.

APPENDIX 2: Greenland Mineral Resources Act (2009, amended Dec 2012)

The following translated extracts detail the regulation for Personal Collection Allowances and Small-scale Licences. We note that at the time of publication only six small-scale licenses, and no gemstone export licenses have been issued.[44]

Personal Collection Allowance

- Greenlandic residents are permitted to carry out the commercial collection of 'non-precious' minerals, without a license, up to the value of DKR 100,000 p/y.
- This excludes the collection of diamond, sapphire, ruby, emeralds, chrysoberyl and opal. It is at the discretion of BMP to add to this list of exclusions. Provisions determining how these minerals are to be processed, transported, exported and certified are also at the discretion of BMP.
- If the minerals collected commercially are valued at over DFR 100,000, the collector must apply for a small-scale exploration/exploitation license from BMP.
- If the application is denied then the minerals will be confiscated and sold with the proceeds going to the Greenlandic Treasury.
- Extraction can only be carried out using small, handheld tools such as hammers, chisels, crowbars and pickaxes (no mechanical tools).
- The cost of applying for a license, and the processing cost, is left to the discretion of BMP.
- Greenlanders are not permitted to collect minerals from exploration or exploitation licence areas

Small-Scale Licenses

- In order to obtain a small-scale exploration/exploitation license, a Greenlandic resident (subject to certain qualifiers) must be present a commercially viable proposal to BMP.
- This proposal must include an implementation plan (including information on production and related facilities) as well as a plan to decommission any facilities once the license is concluded. There may be a fee upon application, also at the discretion of BMP.
- The government will collect revenue either in the form of an annual fee, dependent on the size of the exploitation area, or in the form of profit-sharing from the activities covered by the license (dividend tax). These plans must be approved by BMP before any extraction can occur. The rules regarding the use of non-mechanical tools also apply.
- Licenses may be exclusive (maximum land covered 1km2) or non-exclusive to a given region. Neither exclusive, nor non-exclusive licence holders can collect on land already subject to an exploitation or exploration licence. A licence is valid for three years (this can be extended on agreement with BMP).
- All final decisions are in the hands of BMP (although there is an appeals process with a six week time limit).

APPENDIX 3: Remodelled Revenue Estimates

The table below uses True North Gems' numbers to calculate potential cashflow and government revenue from the sale of rough and polished ruby and sapphire from Greenland.

		Rough/Polished Distribution of Sales from Greenland										
Ruby	Sold as rough	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%
	Sold as polished	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Sapphire	Sold as rough	100%	90%	80%	70%	60%	50%	40%	40%	40%	40%	40%
	Sold as polished	0%	10%	20%	30%	40%	50%	60%	60%	60%	60%	60%
Pre-Tax Cashflow		-$121,114,000	-$92,924,000	-$64,734,000	-$36,543,000	-$8,353,000	$19,837,000	$48,028,000	$52,232,000	$56,437,000	$60,642,000	$64,847,000
Tax Payable in Greenland		$0	$0	$0	$0	$0	$4,882,000	$11,820,000	$12,855,000	$13,890,000	$14,925,000	$15,959,000
Post-Tax Cashflow		-$121,114,000	-$92,924,000	-$64,734,000	-$36,543,000	-$8,353,000	$14,955,000	$36,208,000	$39,378,000	$42,547,000	$45,717,000	$48,887,000

ENDNOTES

[1] When conducting this research, every Greenland household visited had rough gemstones on display, often alongside whalebone carvings.
[2] Prior to BMP's change in policy members of the Greenland Stone Club had been given export licenses of up to 1000kg in order to take Greenland rubies to trade shows around the world, presumably to attract interest from the corporate mining industry. (Palle Moller, 2007, 'En sten I turists hand – er bedre end ti I fjeldet', *Atuagagdliutit*).
[3] http://www.truenorthgems.com/
[4] "True North Gems recovers 15 tonne ruby mini-bulk sample from Greenland", April 3rd 2006, http://www.truenorthgems.com/section.asp?pageid=19491**.** Note: an exploration licence does not entitle a company to remove minerals from a region. For valuation and other purposes, **the minerals still belong to the Greenland state, and can not be sold unless an exploitation licence is granted.**
[5] "True North Gems Announces Management Changes" http://www.sedar.com/CheckCode.do;jsessionid=0000bHXFZzDRgsIuOkp8GNAqO_X:17lkkk26t
[6] When assessing quality TNG place the corundum (ruby/sapphire) into three categories: gem quality, near-gem quality, and non-gem quality. Gem and near-gem are considered to have commercial value.
[7] "True North Gems Initiates $1.1M Exploration Program …", July 5th 2006, http://www.truenorthgems.com/section.asp?pageid=19484
[8] Anette Jørgensen is no longer an employee of BMP.
[9] Confirmation of this obtained from interviews with Fiskenæsset residents and former TNG employees who attended the meeting.
[10] 'Qeqertarsuatsiaani rubinisirneq', Nuuk TV, 2006
[11] These are difficult to find; they are currently archived in the Press Releases section of TNGs website under the heading of 'True North Gems Appoints William Anderson to Board of Directors', http://www.truenorthgems.com/section.asp?pageid=19460
[12] "True North Gems appoints …", February 16th, 2007, http://www.truenorthgems.com/section.asp?pageid=19458
[13] True North Gems Announces Greenland Ruby and Pink Sapphire Valuations, May 16 2007 http://www.truenorthgems.com/section.asp?pageid=19454
[14] Later valuations: http://www.truenorthgems.com/section.asp?pageid=19437 / http://www.truenorthgems.com/section.asp?pageid=19436
[15] See: http://www.truenorthgems.com/upload/pdfs/Greenland_Ruby_Presentation_2012.pdf
[16] 'True North Gems registers eight-fold expansion of Greenland ruby …', June 20th 2007, http://www.truenorthgems.com/section.asp?pageid=19450
[17] Information obtained through an interview with Mr Niels Madsen, where he also presented copies of his correspondence with BMP.
[18] Since 1981 the distinction of "precious-versus-semiprecious" gemstones is not longer recognised or taught by the Gemological Institute of America (GIA), the world's largest and foremost educator in gemology. Furthermore, the language "precious-versus-semiprecious" is no longer considered valid by the International Colored Gemstone Association (ICA) or the American Gem Trade Association (AGTA), the two largest and most important professional associations in the global gemstone and jewelry business. Lastly, this distinction is no longer recognised or accepted by the Federal Trade Commisiion (FTC), and is not admissible in an international court of law.
[19] Confirmed in writing by BMP. 'Guidelines for tourists concerning exportation of stone' 11 July 2003. '. For media reports, see Stor Rubin-Fangst I Gronland', Lasse Borgwardt Schmidt, 2007, *BT* 5th August
[20] 'Udtalelse vedr. Niels Eske Madsen I sagen angaende William Rothert [sp]', 3 September 2008, Pollitmesteren I Greenland

[21] Mr Madsen has subsequently sued both BMP and TNG for false accusation and mismanagement of his case claiming that TNG staff had falsely told BMP that Mr Rohtert had stashed a box of high quality rubies either in Nuuk, Fiskenæsset or at Mr Maden's apartment. The case is still pending.

[22] Anklageskrift, 10th November 2008'

[23] Letter dated August 28 2007.

[24] Inatsisartut Ombudsmandiat Landstingets Ombudsmand, 'Klage fra Niels Eske Madsen over Rastofdirektoratets pabud af 14 august 2007 om overholdelse af rastofloven, 13 November 2009

[25] Interview with Andrew Lee Smith, Founder and CEO of True North Gems, September 25th 2008, http://www.fairjewellery.org/andrew-lee-smith-ceo-of-true-north-gems-an-exclusive-fairjewelleryorg-interview/

[26] Export License, 29th March 2007, Nr. 010/2007

[27] 'Vedr. Eksporttilladelse for aktiviteter ved Fiskenæsset', 18 May 2007,

[28] It is unclear whether these events contributed to Mr Noahsen's decision to continue to Denmark. In Denmark, with no rubies to sell his money ran out, and he took the decision to attempt to smuggle hash back into Greenland. For this he was caught, charged and convicted.

[29] An example of this has be seen in a letter from Kim Kielsen, the then minister for minerals and petroleum, to William Rohtert on the 27th March, 2008 saying, "A part of this strategy is to secure the Greenlandic society as a whole benefits from its natural resources and not leaving potential gains to a few."

[30] We have used True North Gem's 2011 pre-feasibility study as a guide since there are no operational large-scale mines in Greenland at this time. All financial calculations are in Canadian Dollars

[31] Income tax in Greenland is set at a flat rate of 42% (although this can differ between municipalities). In order to obtain income tax receipts within the projected range of $1.1-$2.2 million p/y TNG would have to be paying their workers an average wage between $33,703/€23,965/DKr178,571 and $65,405/€47,929/DKr357,142 p/y.

[32] True North Pre-Feasibility-Report, 2011: page 16, http://www.truenorthgems.com/upload/pdfs/True_North_Gems_2011_PFS_Report_2.pdf

[33] True North Gems, Social Impact Assessment, Aappaluttoq, pg. X, May 2013 http://naalakkersuisut.gl/~/media/Nanoq/Files/Hearings/2013/TNG%20QEQ/Documents/SIA%20Executive%20Summary%20eng.pdf

[34] Table 36 - TNG pre-feasibility report: http://www.truenorthgems.com/upload/pdfs/True_North_Gems_2011_PFS_Report_2.pdf

[35] Final Rough Value: weight*rough ruby value per gram

[36] Final Polished Value: (weight*polished ruby value per gram*retention rate)-(weight*polishing cost*retention rate)

[37] "True North Gems opens office in Bangkok, Thailand", http://www.truenorthgems.com/section.asp?pageid=19442

[38] True North Gems: Ruby and Pink Sapphire Introduction Jan 25, 2011, Page 2: http://www.truenorthgems.com/upload/pdfs/RubyIntroductionEnglishFinal.pdf

[39] "How to make small-scale mining sustainable", The Guardian, http://www.guardian.co.uk/sustainable-business/small-scale-mining-sustainable

[40] 'Responding to the challenge of artisanal and small-scale mining: How can knowledge networks help?', IIED, http://pubs.iied.org/pdfs/16532IIED.pdf

[41] This has been deduced using TNG's lower boundary of predicted employment (60) and multiplying by ten, based on the global average. This is a conservative estimate; it is based on one mine focusing solely on ruby/sapphire when there are in fact many more types of gemstones to be found and mined in Greenland.

[42] For more information on similar models please refer to The National Gemstone and Jewellery Authority website www.srilankagemautho.com.

[43] Doyle and Bendell. (2011) "Uplifting the Earth: The Ethical Performance of Luxury Jewellery Brands" http://www.lifeworth.com/consult/wp-content/uploads/2011/06/UpliftingTheEarth.pdf

[44] 'List of Mineral and Petroleum Licenses in Greenland', March 16, 2013, pg. 22-23, http://www.bmp.gl/images/stories/minerals/list_of_licences/list_of_licences.pdf. In regard to the number of gemstone export licences issued, a confirmation request was sent to BMP without response.