NUNAVUT SMALL CRAFT HARBOURS REPORT

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Pêches et Océans Canada
Fisheries and Oceans Canada

Nunavut

Disclaimer

This report was jointly developed in 2004 by an intergovernmental committee established by the Deputy Minister of Nunavut's Department of Community Government and Transportation, and the Deputy Minister of Fisheries and Oceans Canada (DFO). The mandate of the DFO-Nunavut Harbours Working Committee was to review and assess Nunavut's request for financial assistance for harbour infrastructure from DFO's Small Craft Harbours Branch. This report summarizes its findings and proposes possible implementation and funding options.

EXECUTIVE SUMMARY

Nunavut, Canada's newest territory, has both renewable and non-renewable resources which will likely play a significant role in Canada's future economy. At this time, however, Nunavut is in its development phase in terms of infrastructure, capacity building and integration into the 21st century wage economy.

If the Canadian government were to address Nunavut economic and social development issues on the basis of conventional economics, it may well determine that Nunavummiut should be relocated to southern Canada with its developed infrastructure and available employment. Given that such a policy is not an option for a number of reasons -- not the least of which is Canadian sovereignty of the north -- it is essential that public investments be undertaken with the goal of establishing a self sustaining, market-based economy and society.

In this scenario commercial fishing, particularly the shrimp and turbot in the eastern Arctic, has the most immediate and greatest potential to create non-government employment, promote entrepreneurship, develop management capacity, and perhaps most importantly instill pride, confidence and hope in the 29,000 plus inhabitants of the territory. Nunavut's commercial fishery has, over its brief existence, undergone and continues to undergo rapid and dramatic changes. Over the last two decades, the fishery has evolved from a subsistence industry into a commercial industry. Changes envisioned, over the next 10 years, include: increasing quotas as scientific-based stock assessments are undertaken; an increasing share of the quotas being allocated to Nunavut interests; and the development of an inshore fishery. These developments will result in a significant increase in economic spin-offs to Nunavut in terms of employment and capacity building from fish harvesting, processing and marketing. Without functional harbours it is impossible for this to occur. Improved harbour infrastructure will:

1. increase efficiency and therefore financial returns to stakeholders (Nunavut communities) from the offshore fleet and create local employment. Vessels will be able to offload their product into community freezers for further processing and/or transhipment by reefer ship to market,
2. provide a platform from which both inshore and exploratory fishing fleets can safely operate and offload their catch at local fish plants,
3. provide a second transportation system (in addition to air) during the open-water season, and,
4. increase user safety while enhancing the potential for tourism and other economic and social activities.

The report supports Nunavut's request for fishing harbour infrastructure in seven small communities, namely Pangnirtung, Clyde River, Qikiqtarjuaq, Pond Inlet, Chesterfield Inlet, Repulse Bay and Kugaaruk. Building such infrastructure would generate $14.4 million in GDP and 173 jobs during construction, and more importantly, create $7.9 million in GDP and 198 jobs on an ongoing basis, and, reduce unemployment in the seven communities by 26 percent.

The findings of the report suggest that an investment of up to $41.2 million (including an adjustment for inflation and a 15% or $5.06 M contingency for cost overruns and habitat impacts) over a 5 to 8 year period would be required to construct harbours at the seven requested sites. The mandate of the Fisheries and Oceans Canada (DFO) Small Craft Harbours (SCH) program most closely matches the primary use of the required infrastructure, and has the management and technical expertise that would be needed to undertake this specialized construction. It is also suggested that after construction DFO-SCH assumes responsibility for major maintenance costs while the Government of Nunavut, local communities and/or Harbour Authorities (HAs) be responsible for harbour operations and minor repairs. For logistical reasons the seven-harbour project would need to be funded as one project with significant financial flexibility in terms of cash flow, tendering and construction options. DFO, with the possible support of Nunavut, Indian and Northern Affairs Canada (INAC), Transport Canada (TC), and Industry Canada (IC), could seek Cabinet approval for the funding as the budgets of all departments are fully committed.

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1. INTRODUCTION

In February 2004, Nunavut's Department of Community Government and Transportation (CG&T), now the Department of Economic Development and Transportation (ED&T), presented the 'Safe Harbours – Healthy Communities' report to Fisheries and Oceans Canada (DFO). This report identified the lack of marine infrastructure as the most significant impediment to the development of Nunavut's emerging commercial fishery. The report requested that DFO construct seven commercial fishing harbours under its Small Craft Harbours (SCH) program, namely in Pangnirtung, Clyde River, Qikiqtarjuaq, Pond Inlet, Repulse Bay, Chesterfield Inlet and Kugaaruk.

In March 2004, the Deputy Ministers of CG&T and DFO established an inter-governmental DFO-Nunavut Harbours Working Committee to review, assess and develop a considered response to Nunavut's request for financial assistance for harbour infrastructure from DFO's Small Craft Harbours Branch. The Working Committee, co-chaired by Robert Bergeron, Director General, SCH, and Methusalah Kunuk, Assistant Deputy Minister, Economic Development and Transportation, Government of Nunavut, consisted of management and professional staff from both governments. DFO committee members were drawn from the SCH headquarters in Ottawa (Michel Lafleur, Francois Bellehumeur) and from the Central and Arctic Region SCH office in Winnipeg (Alan Kathan). Richard Mackenzie, Director and Alan Johnson, Acting Senior Transportation Planner, Economic Development and Transportation, and Wayne Lynch, Director Fisheries and Sealing, Department of Environment represented the Government of Nunavut on the Working Committee.

In accordance with its mandate the Working Committee undertook a comprehensive investigation of the needs, costs and benefits of constructing the seven harbours requested by the Government of Nunavut. This report summarizes its findings and proposes implementation and funding options.

2. BACKGROUND

2.1. NUNAVUT

Nunavut's situation is well-communicated in this excerpt from a 2004 Standing Senate Committee on Fisheries and Oceans report:

> *In 1993, after many years of discussion and negotiations, the Inuit of the central and eastern Arctic and the Government of Canada signed an Aboriginal land claims agreement within the meaning of section 35 of the Constitution Act, 1982. The Nunavut Land Claims Agreement (NLCA) is Canada's largest land claim agreement. It created a relationship between the Nunavut Inuit and the Government of Canada respecting coordinated wildlife management both within and outside the geographic area covered by the Agreement, and set in motion plans for the creation of a new territorial government that afforded residents greater control over their future. On 1 April 1999, Nunavut—which means "our land" in Inuktitut—officially became Canada's third territory.*
>
> *Nunavut: has an ocean coastline of 104,000 kilometres (approximately 43% of Canada's ocean coastline); encompasses about one-fifth of Canada's geography (or 1.9 million square kilometres); has a population of approximately 29,000, of whom 85% are Inuit; and is governed by a public government framework that represents all residents, Inuit and non-Inuit alike. The Government of Nunavut is the only one in Canada that functions within the framework of a land claim agreement, and operates under a consensus system of government rather than one based on political parties.*
>
> *As Canada's newest political jurisdiction, Nunavut faces a number of economic and social challenges. About 91% of its budget comes from federal transfers. Demographically, the most startling feature of its population is its youth; with a median age of 22.1 years, Nunavut's population is the youngest in Canada. The population is also the fastest growing: in 2001, it was just under 29,000, representing an increase of 8% in only five years. Forty-six percent of Nunavummiut are under 19 years of age, compared to 26% for the rest of Canada. This sets the stage for an increasing need to create jobs in a region where the largest employer is government, and where unemployment and the cost of living are significantly higher than in the rest of the country.*
>
> *In 1999, the overall unemployment rate in Nunavut was 20.7%, compared with 8.5% for Canada overall. For Inuit, the rate was 28%, compared to 2.7% for non-Inuit. The unemployment rate was 11.9% in Nunavut's three regional centres, 29% in medium-sized communities, and 23.8% in the smaller communities. The picture is especially bleak in the communities. For instance, Qikiqtarjuaq, with a population of 519 people in 2001, had only 45 full-time jobs in the community. Unemployment in turn exacerbates a host of social problems, including alcoholism and high rates of youth suicide.*
>
> *Another distinctive feature of the economy is its mix of traditional subsistence activities (wildlife harvesting), wage employment, private enterprise, and transfer payments. Sustainable development also faces many unique challenges: uneven distribution of economic opportunities; high transportation, energy and communication costs; isolation*

from potential markets; a small population with few industrial skills and little formal education; and insufficient transportation infrastructure. With regard to the values driving Nunavut's development, the Conference Board of Canada identified in 2001 the following:

- *A collective approach to socio-economic development, including a strong belief that economic opportunities should be shared among all communities;*
- *A move towards greater self-reliance, including Inuit having greater political and economic control of Nunavut and its environment;*
- *Inuit Qaujimajatuqangit (IQ), or the recognition of the value of Inuit knowledge and integrating it with other knowledge sources, with consensus building and consultation being the preferred route for decision making;*
- *Economic development focused primarily at the community level because of strong attachment to one's community;*
- *Support of land-based economic activity as an important part of life, with no evidence to suggest that land-based economic activity is valued less than participation in the wage economy; and*
- *Sustainable development whereby equal importance is given to the development of human and natural capital.*

More specifically, the Conference Board identified Nunavut's fishery as having significant opportunities for continued economic growth. However, despite its extensive marine coastline and historic attachment to marine resources, Nunavut's involvement in commercial fishing remains limited. Because Nunavummiut do not own their own fishing vessels, boats from elsewhere are offered the opportunity to fish in offshore areas in exchange for seasonal employment for Inuit, and royalties. Significantly, royalty income—the process of selling "fish in the water"—is much less than what could be obtained if the catch were directly harvested, processed and marketed by Nunavummiut themselves. According to one estimate in 2002, the number of people working on offshore vessels was approximately 20. Closer to shore (in "inshore waters"), approximately 24 Inuit fishers harvested turbot through the ice in Cumberland Sound for about four months, and 56 were employed in fish processing at Pangnirtung Fisheries.

(Nunavut Fisheries: Quota Allocations and Benefits: Report of the Standing Senate Committee on Fisheries and Oceans, April 2004, pages 1 to 4.)

The above excerpt from the Senate Standing Committee sets the context for the Nunavut Government's request for harbour infrastructure. It is clear from the excerpt that Nunavut's renewable resources, in particular the fishery, are key to the future economic development of the Territory.

In order for Nunavut communities to fully benefit from an expanding access to the fishery, there has to be inevitably the development of an inshore fishery, and more local landings and processing, all of which require adequate harbour infrastructure which is currently non-existent. Of the seven communities highlighted in Nunavut's request, only Pangnirtung and Qikiqtarjuaq have minimal existing infrastructure, namely partial breakwaters with small wharves which offer limited protection but no functional berthing. Compared to the rest of Canada, Nunavut is a century behind with respect to harbour infrastructure. While there is a need to rationalize elsewhere, in Nunavut there is a need for new harbour investments in support of commercial

fishing, safety of subsistence fishing and marine mammal hunting, transportation and community re-supply and some tourism development.

2.2. DFO'S SMALL CRAFT HARBOURS PROGRAM

The SCH program was established in 1973/74 with a mandate to support the commercial fishing and recreational boating industries. In recent years the program's mandate, as a result of insufficient funds, has been reduced to supporting only the commercial fishing industry. This program is presently responsible for the maintenance and management of a national network of harbours critical to the commercial fishing industry. These harbours are generally managed by non-profit Harbour Authorities who are tasked with operating the harbours and undertaking necessary minor repairs from user fees. SCH's current network of more than 1000 harbours across Canada does not extend to Nunavut.

3. SOCIAL AND ECONOMIC CONSIDERATIONS

The Working Committee commissioned GSGislason & Associates to undertake a study to determine, and, where possible, to quantify, the social and economic benefits that could be expected from developing the seven Nunavut harbours -- Chesterfield Inlet, Clyde River, Kugaaruk, Pangnirtung, Pond Inlet, Qikiqtarjuaq and Repulse Bay (see Appendix B). Based on original research as well as a review of a number of other studies, the GSGislason & Associates report notes that:

- the federal government presently has no harbour investments in Nunavut
- the lack of harbour infrastructure is preventing communities from tapping emerging economic development opportunities
- Pangnirtung is the only community that presently has a real wharf although the wharf is accessible only to small vessels and only at half or higher tide
- close to 500 boats exist in the seven communities in total, with over 97% of them being under 8m (26 feet in length)
- all communities use the ocean for subsistence travel, either directly to hunt for seals and narwhal or indirectly to travel to land-based caribou hunting grounds
- commercial char fishing occurs in most communities, commercial turbot fishing occurs only in Pangnirtung although large vessels from southern Canada do fish turbot in water adjacent to Nunavut
- the overall unemployment rate in the seven communities is 23%
- marine tourism is in its infancy in the communities
- all of Nunavut's 26 communities are located on its coastline. The Territory has no roads that connect communities – intercommunity travel by necessity must be by air or water.

3.1. ECONOMIC BENEFITS

GSGislason & Associates conclude that, "The seven (7) proposed DFO Small Craft Harbours facilities will become a major economic and community force in Nunavut. The harbours serve as a platform that allows and enables a variety of commercial fishing, tourism and other ventures to proceed. The harbours also provide increased convenience and increased safety to subsistence hunters and fishermen, an important benefit to Nunavut people".

Assuming total one-time construction costs of $34 million (which does not include contingencies or adjustment for inflation), annual ongoing operation and maintenance costs of $1.5 million, and the maximum utilization of local labour and equipment, GSGislason & Associates estimate that the total economic impact of developing the seven harbours will be as follows:

Table 1

Economic Impacts of Harbour Construction	
Harbour Construction (one-time):	Increased Impacts
Gross Domestic Product	$14.380 million
Labour Income	$ 8.510 million
Person-years of Employment	173
Ongoing Harbour Operation (annual):	
Gross Domestic Product	$ .520 million
Labour Income	$ .440 million
Person-years of Employment	9
Stimulated Economic Fishing Activity (annual):	
Gross Domestic Product	$ 7,330 million
Labour Income	$ 5,820 million
Person-years of Employment	189

The estimates for "Stimulated Economic Activity" noted above arise primarily from the expansion of the char and turbot fisheries that would occur as a result of harbour construction. The GSGislason report projects a 60 tonne (100 percent) increase in the commercial char catch in the seven communities, and an 1,800 tonne increase in a commercial inshore turbot catch in the four Baffin Island communities alone due to offshore quota reallocation and some industry restructuring. An identified opportunity to store raw fish at local, private sector, cold-storage facilities has considerable "upside" benefits but were not incorporated into the above-noted projections. Furthermore, the projection of economic activity stimulated by the construction of harbour facilities is considered to be on the conservative side since the anticipated long-term potential of the shrimp, clam, scallop and other fisheries was not included in their estimates. Subsistence harvests (fish and marine mammals) are projected to increase by 10% to 20% in all communities. Tourism expenditures are projected to double to almost $2 million annually as a result of Nunavut harbour investment. Most of this expenditure increase is anticipated to occur in the scenic Baffin Island communities of Pangnirtung and Pond Inlet. Finally, GSGislason projects a modest decrease in boat damage of $300K per annum.

In human terms, GSGislason & Associates estimate that the key benefit of harbour development in the seven communities will be a 26.0 % reduction in the average unemployment rate (from 23% to 17%).

The economic benefits flowing from harbour development will vary by community based on existing and potential fisheries and marine mammal harvest; current and future infrastructure (fish plants, boats), community size; etc. Gislason's report notes in Exhibit 6, summarized below (see Appendix B), the greatest economic benefit will accrue in the four Baffin Island communities primarily due to the well-established, but evolving turbot and shrimp fisheries.

Because there is no potential for a commercial turbot and shrimp fishery in the adjacent waters of the remaining three communities in the Kivalliq and Kitikmeot regions there will be fewer economic benefits in absolute terms. However, the cost of developing harbours in these two regions is significantly less than in Baffin Island communities due to lower tides and smaller size of vessels to be accommodated. At present, less than 20% of the commercial char quota is being fished largely due to a lack of harbour, processing and marketing infrastructure. Further, DFO officials estimate that new and unexplored fisheries located further from the communities could result in char quotas being increased by 30%. Hence it is reasonable to assume that significant growth potential exists for the char fishery. The same will likely hold true for the subsistence and marine mammal fisheries.

Table 2

Construction and Post-Construction Economic Impact by Community				
Community	Construction Impact		Post-Construction Annual Economic Impact	
	GDP ($,000)	Employment (PYs)	GDP ($,000)	Employment (PYs)
Chesterfield Inlet	1,540	19	350	11
Clyde River	1,380	17	1,270	29
Kugaaruk	1,620	20	300	11
Pangnirtung	3,560	43	2,610	67
Pond Inlet	3,700	43	1,660	39
Qikiqtarjuaq	770	10	1,310	30
Repulse Bay	1,810	21	350	11
i.				
i. TOTAL	14.380	173	7,850	198

(source: summary of Exhibit 6 – Appendix B)

3.2. SOCIAL AND COMMUNITY BENEFITS OF HARBOUR INFRASTRUCTURE

Social and community benefits of infrastructure can be notoriously difficult to quantify due to the nature of the qualitative benefits. Perhaps the following quote from the study published by Coastal Communities Network in January 2004 "Between the Land and the Sea – The Social and Economic Importance of Wharves and Harbours in Nova Scotia" can be utilized to enumerate the benefits of harbour infrastructure:

> *Harbour infrastructure protects millions of dollars invested in user business assets, allows safe user operations, prevents coastal erosion and damage, provides local economic development and employment, offers refuge for mariners in distress and for some remote communities their only transportation link.*
>
> *DFO harbours have evolved from their use for the transportation of goods and people between coastal communities to the multi-use "working" harbours of today. At all*

stages the "government wharf" has been, and remains, an integral part of the economic and social fabric of the community.

While social and community benefits tend to be less tangible, GSGislason & Associates believe that "the jobs and income derived from harbour construction and operations and from on-going economic endeavours will draw some people off social assistance into meaningful employment and help reduce several social problems associated with high unemployment". To the extent that this occurs, government expenditures on social assistance will be reduced. Moreover, the employment created will be local thus allowing individuals to remain in their own community. Nor should it be forgotten that safe harbours reduce accidents and save lives. Other benefits noted from harbour development include:

- becomes a focal point for community events and activities such as festivals, celebrations, leisure activities etc.
- facilitates inter-community travel and socialization
- increases safety and comfort of users
- easier and more efficient community re-supply from the south
- allows for emergency access to/from the community during open water season
- provides better community access to the supply of carving stone for local artisans.

Social benefits are more difficult to quantify. Nevertheless, one such benefit flowing from Nunavut harbour development identified by GSGislason and Associates, namely safety, is to some degree quantifiable. Lack of Nunavut harbour infrastructure has resulted in at least 2 documented cases of loss of life in recent years. In 2002 a Pond Inlet fisher drowned while paddling his dinghy from shore to his fishing vessel moored offshore. A Rankin Inlet fisher died under similar circumstances in 2005.

It is recognized that the social benefits flowing from harbour development in the seven Nunavut communities may well be equal to or greater than their readily quantifiable economic benefits. One must not forget the enhanced social and spiritual well-being of individuals, families and communities also produces measurable economic benefits over time through reductions in substance abuse, family violence, criminal activity, and economic dependence on the state.

Finally, Canadian sovereignty in the North would be boosted significantly by the regular use of a network of Nunavut harbours by federal patrol and research vessels. It can be argued that a visible national presence in Nunavut becomes more important as the impact of climate change on the North steadily lengthens periods of ice-free access to northern shipping channels and increasingly attracts world attention.

4. NUNAVUT HARBOUR NEEDS

4.1. COMMUNITY SELECTION

Nunavut has 26 communities, all of which are located on water and require harbour facilities. This report addresses the needs of seven communities as previously noted. Three other communities (Iqaluit, Rankin and Bathurst Inlet) require large commercial marine transportation infrastructure that, for the most part, falls outside of SCH's mandate of providing support to the commercial fishing industry.

The Government of Nunavut selected seven communities as having the highest priority for commercial fishing harbour development. The selection criteria were: current volumes of subsistence and commercially harvested fish and marine mammals; available but unharvested quota; potential employment opportunities; support for new and/or existing fish plants; and balanced regional investment.

It is anticipated that the remaining 16 communities will eventually require harbour infrastructure to: support their subsistence and developing commercial fishery; support intercommunity travel; improve boating safety; and facilitate resupply, tourism, etc. While the Working Committee has not investigated these sites it estimates that the cost to build suitable harbour infrastructure could range from $3.0 to $4.0 million per harbour depending upon identified needs and suitability of harbour sites.

4.2. RATIONALE AND APPROACH TO NUNAVUT HARBOUR DEVELOPMENT

The underlying premise of the Nunavut Harbours Working Committee is that harbours will be designed and built to:

- Meet current primary and secondary community needs in a holistic fashion.
- Allow for phased expansion of berthing capacity, at minimal cost, to meet future projected community needs over the next 20 years (e.g. floating wharves).
- Provide the best long term value for expenditure of public monies.

In addressing the need for harbour infrastructure, the Committee attempted to consider all community needs even though some are not covered by the SCH program mandate such as tourism and intercommunity travel. It is considerably more cost-effective and efficient to construct harbours that meet all of the identified community needs at one time rather than taking a piecemeal approach. This is particularly true in the North because of its remoteness and extreme climate. It was recognized that the harbour development proposals contained in the report would not meet the commercial needs of future large-scale resource extraction activities, (i.e. mining, oil & gas exploration) should they develop.

BREAKWATERS:
The most important and most costly structure is the breakwater. It is required to provide wave protection to all other structures (i.e. wharves, basin, vessels). The incremental cost of constructing a breakwater which protects a slightly larger basin to accommodate future growth is minimal, and certainly much less than the cost of mobilizing and de-mobilizing equipment to remote sites a second time. It is estimated that to mobilize and de-mobilize equipment to most Nunavut sites would require 6 to 12 months lead time and cost $250,000 to $500,000. Properly situated and constructed breakwaters could likely be extended to accommodate expanded

fishing, resupply, tourism, or mineral extraction needs. Relocating a breakwater to accommodate growth can be prohibitively expensive if it is built in the wrong location.

The choice of design for Nunavut breakwaters is rubble mound because rock is readily available in all communities and therefore low-cost. Rubble mound breakwaters also have a long life expectancy and are relatively easy and inexpensive to maintain/repair. Driving steel sheet piles into the ground, a common alternative method, is not an engineering or economic option in the North because of the rocky conditions found in most communities. Northern breakwaters should be engineered and built to slightly higher standards than the southern norm to reduce maintenance costs and, to the maximum extent possible, ensure that any needed repairs can be undertaken within the community using local labour and equipment.

FIXED WHARF:
All communities require a fixed wharf and a crane to safely offload heavy cargoes such as fish, gear, and fuel. The wharves will vary in length from 20 to 30 metres; their depth will vary by location depending on the height of tides and the size of the vessels to be accommodated. To reduce costs but still accommodate larger (65 m) fishing trawlers, mooring anchors will be imbedded into the breakwater a few metres beyond each end of the fixed wharf. This will reduce the cost of building fixed wharves by approximately 50 percent. In the case of Pangnirtung, this approach will reduce construction costs by $1.2 million.

LARGE FLOATS:
All Nunavut communities require berthing for 11 to 15 metre fishing vessels. The design concepts include larger and sturdier floating wharves that can accommodate such vessels. The cost of floating wharves is 10 – 15% that of fixed wharves. Using large floats instead of fixed wharves will reduce the cost of the Pangnirtung harbour by an estimated $1.2 million. Besides costing significantly less, floating wharves lend themselves to local construction and phased expansion to accommodate future growth. As they ride up and down with the tide, floating docks tend to be more functional. However, they have the disadvantage of requiring more operational attention during the boating season and have to be removed from the water prior to freeze-up to prevent ice damage.

SMALL FLOATS:
Floating wharves have proven to be a cost-effective and efficient means of providing safe berthing for the 7 to 9 metre boats which are common in most Nunavut communities. Like the large floats, the smaller floating wharves have the advantages of being: 10 to 15 % of the cost of fixed wharves; constructed locally; and expanded in phases to accommodate future growth. Floating docks tend to be more functional than fixed docks/wharves as they move with the tide. Like the large floats, the small floats have the disadvantage of requiring more operational attention during the boating season and have to be removed from the water during the winter.

ENTRANCE CHANNEL:
Nunavut's primary need is "all-tide" harbour access for smaller vessels (< 10 m) which cannot handle large storms. At present, small vessels are often forced to hide out in coves for hours, and in some cases for days, until the storm passes. The alternative is to risk life and property to return to home port. Even in good weather, vessels beached on rocky shorelines are often damaged by waves resulting in an average life expectancy of 3 - 5 years.

To reduce costs, only high tide access would be provided for large (65 metre) fishing trawlers and only half or higher tide access for mid-sized (11 to 15 m) fishing vessels. These vessels will have to remain berthed until the next high tide, usually 12 hours away. Even this limited access will increase safety and efficiency as offloading times will be reduced to less than 10 hours compared to the two or more days currently required. This approach will significantly reduce construction costs. For example, the cost of providing all-tide access for the fishing trawlers at Pangnirtung is estimated at $8.4 million versus $2.4 million for only high tide access, for a saving of $6.0 million.

The channels are designed so that there should be no re-dredging costs for many years (more than 25). This is important as the equipment necessary to do this work is not available within the community. Deepening the channel at a later date to accommodate new needs can be undertaken without impacting on other structures.

BASIN:
The harbours will be designed and dredged to accommodate smaller fishing vessels (< 10 m). However, a basin beside each fixed wharf will be dredged deeper to accommodate large vessels during the entire tide cycle while tied to the wharf. Since the channel is not as deep as the wharf basin, large vessels will only be able to enter and exit the harbour during high tide.

MARSHALLING AREA:
All Nunavut communities depend extensively upon regular resupply of dry and wet cargo by ship. The harbours are therefore designed to accommodate such dry cargo vessels as well as provide for storage of delivered goods in the upland marshalling area. This will make community resupply more efficient and less costly.

LAUNCH RAMP:
Each harbour will be provided with a launch ramp. This will allow community boats to be launched and removed from the water in a safe and efficient manner.

EQUITY TREATMENT:
As much as possible and practicable, the Nunavut Harbours Working Committee has endeavoured to provide a similar level harbour infrastructure service to each community based on current and anticipated needs.

MAINTENANCE COSTS:
Using standard DFO-SCH methodology, the maintenance and recapitalization costs for the seven harbours have been estimated at $1.5 million annually.

POND INLET, AN EXAMPLE OF THE WORKING COMMITTEE'S PHILOSOPHY AND APPROACH:
Pond Inlet, without DFO-SCH involvement, retained an engineering consulting firm to evaluate its harbour infrastructure needs. The firm proposed two concepts with estimated costs for the first and future phases totalling $11.1 million plus. This compares with an $8.8 million estimated cost of the Working Committee's proposed design which provides for better protection, reduced need for re-dredging, plus more and better berthing capacity for small and mid-sized fishing vessels.

4.3. HARBOUR DEVELOPMENT COSTS MORE IN THE NORTH

It is the Working Committee's assessment that the total projected costs of developing the seven harbours over 5 years will be $40.7 million (including a 15% contingency and adjustment for inflation). This estimate was arrived at after the Working Committee had completed comprehensive consultations with communities, commercial fishers, and large commercial vessel operators. The estimates are also based on new survey information and specialized engineering studies.

The cost of harbour infrastructure development in the North is approximately double that in the south for a number of reasons:

- Equipment and materials must be sea or air lifted from the south.
- Lead times from delivery to commencement of construction are long
- Construction windows are short.
- Storms, long ice periods, high tides and shifting ice require larger breakwaters.
- Extensive skills training is required to maximize local content.
- Remoteness means that unforeseen problems, equipment failures, labour issues etc. take longer to resolve.

Harbours are a long term capital asset. Hence it is important that such investments not be influenced by short term political expediency -- the need to "just do something". This can result in harbour infrastructure being built that is poorly designed, non-functional, inadequate, costly, inefficient to expand, or better built in another location. The Working Committee believes that Nunavut harbour infrastructure should be built to address identified current and future needs and to suit the local environment Harbours built to a higher standard are more likely to withstand Nunavut's harsh climate and accommodate the longer term needs of the community. Under-designed/built facilities are more costly to maintain over the long term. Expanding and/or rebuilding harbours to accommodate unplanned growth is very expensive. For ease of repair and to reduce maintenance costs only basic, low-tech structures are being proposed. While Nunavut's requirement for safe harbours is immediate, there appears to be a desire on the part of all three levels of government and harbour users to do it right the first time.

This being the case, it is desirable that Nunavut harbour development proceed in a well thought-out, logical and phased manner in full consultation and cooperation between the governments of Canada and Nunavut, the harbour users and the communities. While a phased approach will take longer to complete, it will allow for learned improvements to be incorporated into the design and construction of the next harbour. The Committee believes that this approach will cost less in the long run and will provide greater economic benefits to Nunavut.

4.4. METHODOLOGY

In order to understand community needs, local conditions, and achieve buy-in, the Working Committee undertook extensive consultations with Nunavut officials, community leaders and harbour users. Besides holding two or three public meetings in each community, the Committee also toured each harbour construction site.

Due to resource and time constraints, the Working Committee analyzed and used as much existing data as possible. This included: marine transportation studies from the 1980s; Canadian Hydrographic Service (CHS) sounding surveys; geotechnical analyses; etc. Public

Works and Government Services Canada's Marine Division was retained to develop and cost the harbour concepts. Where the risks were deemed to be unacceptably high, specialized consulting engineering firms were retained to undertake a more detailed analysis. Because extensive cost analyses and comparisons were undertaken, the Working Committee is reasonably confident that the estimated project costs are accurate to the Class D (± 25%) level. However, prior to design and construction of each harbour, appropriate engineering (sounding surveys; wind and wave analyses; and geotechnical analyses) and environmental studies will need to be undertaken.

With respect to the availability of charts to ensure safe access to the seven communities, it was noted that as all of these communities either were ports-of-call for the Canadian Coast Guard's Eastern Arctic Sealift or are now covered by the current Nunavut Sealift, the requisite nautical charts for these harbours and their approaches are available from the Canadian Hydrographic Service. CHS had been in the process of updating these charts with the support of Nunavut, and this will once again need to be a priority to ensure safe transit to and from these harbours.

The Working Committee recommends that a 15% contingency be established to cover any construction cost overruns and to compensate for any unforeseen adverse habitat impacts. This assumes that all seven harbours will be treated as one project (for the reasons noted in section 5.1) and any cost overruns at one harbour could likely be offset by savings at other harbours. A higher contingency will be required if each harbour is treated as a separate project.

5. HARBOUR IMPLEMENTATION

5.1. ASSUMPTIONS

For efficiency, economy and flexibility of implementation, the Working Committee recommends that the seven harbours be funded as a single project with a multi-year timeline. This model is used by Infrastructure Canada for their large capital projects. The most efficient and cost-effective method is for the contractor to position equipment and materials in a community in the fall of the year prior to freeze up, and then complete the project over the next open water season. The equipment would then be moved by sealift in sequence to the next harbour construction site before freeze up. Awarding a seven-harbour tender to one or at the most two contractors, would achieve significant economies of scale in terms of supplying and mobilizing heavy equipment and retaining competent operators and project managers. Heavy equipment, once delivered to Nunavut at a high cost from the south by a contractor, would be available to construct more than one (or all seven) harbours. A contractor under this scenario would have more incentive to provide longer term training opportunities and/or apprenticeships for indigenous labour. The exception would be to issue small contracts to interested and capable communities for the construction floating wharves. This would aid in project delivery and provide local employment and capacity opportunities.

5.2. PROJECT DELIVERY

From the outset the Working Committee recognized the potential benefits and efficiencies of constructing the seven harbours over an extended period of time and using local labour, equipment and expertise to the maximum extent possible. This report broadly describes the tendering and project management options, along with their benefits and risks, used by Canada and Nunavut to implement large construction projects.

Further Study Required:
Should this project be approved, the Working Committee would undertake a comprehensive/in-depth assessment of the risks and benefits of the two alternative approaches (federal and territorial as described below) to tendering and constructing the harbours. It should be noted that the risks and benefits associated with each alternative depend in large measure upon a number of factors including approved funding, implementation time frames, number of available contractors, ownership models, etc. which would be known when the project is approved.

Public Works Government Services Canada (PWGSC)
The majority of Canada's large construction projects are managed and implemented by Public Works Government Services Canada (PWGSC). It offers the advantage of an established approach to tendering, bonding/security and project management. PWGSC's tendering system will likely result in a large company from southern Canada being the successful bidder. While these companies will be bondable and have the necessary experience in marine construction, they could be lacking in northern experience and sensitivity.

The disadvantage of having PWGSC handle the Nunavut harbour project may be its inability to provide the flexibility to maximize local capacity-building and content in accordance with the spirit and intent of Article 24 of the Nunavut Land Claims Agreement and Nunavut's Nunavummi Nangminiqaqtunik Ikajuuti (NNI) policy. Further, PWGSC may not have the flexibility envisioned by the Government of Nunavut and the Working Committee to obtain maximum cost efficiencies

which will only be achieved if one or a maximum of two, multi-year contracts is/are issued for the seven harbours.

Nunavut
Nunavut is attempting to build the capacity of local management, labour and entrepreneurs to undertake increasingly larger roles in future economic development projects. Under the Government of Nunavut's tendering system, for example, points are allocated to bidding companies that utilize local Inuit firms and employ Inuit labour. While this may add to the total project cost, it results in greater capacity building and larger economic spin-offs within Nunavut.

The disadvantage is that a Nunavut-based company may not have the required equipment or expertise to do specialized construction, or may not be bondable. This could result in projects being poorly constructed and thus subject to increased repair costs, and not being completed on schedule and within budget. Ideally there would be enough firms bidding on the project that price bids would be competitive and DFO-SCH would be satisfied that the selected contractor is capable of delivering as per the tender.

5.3. PROJECTED COSTS FOR NUNAVUT HARBOUR CONSTRUCTION

Table 3

Projected Cost of Harbours ($000)

	Detailed Harbour Construction Costs Per Community							
	Chesterfield Inlet	Clyde River	Kugaaruk	Pangnirtung	Pond Inlet	Qikiqtarjuaq	Repulse Bay	Total
Breakwater	1,100	1,600	1,700	975	3,500	1,100	1,600	
Dredging	1,170	570	755	3,925	2,400		1,200	
Wharf	350	400	350	1,000	800	250	500	
Floats	210	200	290	570	450	180	170	
Marshalling & Launch Ramp	150		150	100	100	100	130	
Subtotal	2,980	2,770	3,245	6,570	7,300	1,630	3,600	28,095
Engineering Design	298	277	324	657	730	163	360	
Project Management	298	277	325	657	730	163	360	
Project Total	3,576	3,324	3,894	7,884	8,760	1,956	4,320	33,714
Contingency (construction & environmental)								5,057
Inflation *								1,617
Total								40,388

* Based on the 5 year implementation option

5.4. SCHEDULING

The Working Group considered two potential project implementation schedules:

1. implementation on an urgent basis (5 years), or
2. implementation over a longer period of time (8 years).

Various combinations of these options can and should be considered based on unforeseen events such as changing priorities due to new fish quota allocations, development of a fish processing plant, engineering issues, logistical movement of equipment or other extenuating circumstances.

Both project implementation schedules and cash flow estimates (below) assume that 85% of the engineering design costs would be incurred and contracts issued in year one. Further, southern supplied goods (timber, floatation units, etc.) would be purchased and on site one year or more in advance of the start of construction.

The 5 year implementation program reflects Nunavut's desire to immediately construct harbours in a balanced manner both in the Baffin region as well as in the Kivalliq and Kitikmeot regions. The scheduling is primarily based on the projected economic benefits but balanced with a logical and therefore efficient movement of equipment.

Table 4

5 Year Implementation Program ($000)

	Projected Annual Expenditures Per Community					
	1	2	3	4	5	Total
Chesterfield Inlet	250	300	3,026			3,576
Clyde River	235		320	2,769		3,324
Kugaaruk	275			340	3,279	3,894
Pangnirtung	1,400	6,484				7,884
Pond Inlet	620	665	7,475			8,760
Qikiqtarjuaq	135			280	1,541	1,956
Repulse Bay	310		400	3,610		4,320
Sub Total	3,225	7,449	11,221	6,999	4,820	33,714
Contingency	484	1,118	1,683	1,050	722	5,057
Inflation Adjust.		163	503	491	460	1,617
Total	3,709	8,730	13,407	8,540	6,002	40,388

The 8 year implementation program proposes a linear construction schedule, with the first year devoted to harbour design and construction planning, followed by the construction of one harbour for each year thereafter. The scheduling starts with Baffin sites because of their importance to support commercial fishing. The actual harbour sequence is in line with projected economic benefits but balanced with a logical and therefore efficient movement of equipment.

Table 5

8 Year Implementation Program ($000)

	Projected Annual Expenditures Per Community								
	1	2	3	4	5	6	7	8	Total
Chesterfield Inlet	250				300	3,026			3,576
Clyde River	235		320	2,769					3,324
Kugaaruk	275						340	3,279	3,894
Pangnirtung	1,400	6,484							7,884
Pond Inlet	620	665	7,475						8,760
Qikiqtarjuaq	135			280	1,541				1,956
Repulse Bay	310					400	3,610		4,320
Sub Total	3,225	7,149	7,795	3,049	1,841	3,426	3,950	3,279	33,714
Contingency	484	1,073	1,170	458	274	514	592	492	5,057
Inflation Adjust.		156	350	214	174	418	586	577	2,475
Total	3,709	8,378	9,315	3,721	2,289	4,358	5,128	4,348	41,246

6. HARBOUR OWNERSHIP

6.1. CURRENT SITUATION

Assuming federal monies for Nunavut harbour development are available under DFO's Small Craft Harbours program, alternative approaches to infrastructure development and ownership may be considered. SCH's current inventory of harbours were obtained by acquiring the property (upland and water lot), constructing the harbour facilities, and devolving day-to-day management and minor maintenance, generally to a local, non-profit Harbour Authority (HA). As property owner, DFO-SCH is responsible for capital repairs to the harbour infrastructure as user fees are rarely sufficient to cover maintenance costs, particularly should a catastrophic event occur.

In recent years due to limited budgets, DFO-SCH has not been adding new harbours to its inventory. Further, DFO-SCH has been interested in pursuing alternative program delivery mechanisms to reduce or eliminate the ongoing financial liability associated with harbour ownership. Hence two alternative approaches to harbour infrastructure development in the North are presented for consideration.

6.2. DFO – SCH OWNERSHIP MODEL

- DFO-SCH acquires water lot and upland respectively at a nominal cost.
- DFO-SCH develops harbour in consultation with Nunavut, the community, commercial fishers and other harbour users.
- DFO-SCH owns harbour and retains responsibility for major repairs.
- Nunavut, the community and/or HA (with advice from DFO-SCH) assumes responsibility for harbour management and minor repairs. One HA could be created to manage each harbour or preferably one or two HAs to manage all seven harbours.

Pros:

- Provides a consistent approach to DFO-SCH harbour development and operation between the north and south, i.e. seen as fair and equitable between regions.
- DFO-SCH provides world-class expertise in harbour development and management acquired over many years and many projects.
- Less costly and better value for expenditure of public monies.
- Ongoing involvement of DFO-SCH in harbour management and maintenance is complementary to other federal government responsibilities/activities in the North.
- Most politically acceptable/defensible.

Cons:

- Represents an ongoing liability and cost to the federal government.
- Requires ongoing agreement and cooperation between DFO-SCH and Nunavuț.
- Less flexibility to further develop harbours for purposes other than commercial fishing.

6.3. NUNAVUT OWNERSHIP MODEL

- DFO-SCH assists in harbour construction but retains no ongoing ownership or financial responsibility. Two possible approaches:
  1. DFO-SCH acquires temporary ownership of upland and water lot and constructs the harbour. Upon completion, DFO-SCH divests ownership of the harbour to Nunavut, the local community or HA.
  2. Under a grant or contribution arrangement, SCH funds the construction of the harbour through the Government of Nunavut, community or another agency. DFO-SCH assumes no responsibility for construction, management or maintenance of the harbour.

Pros:

- No ongoing financial liability to the Government of Canada.
- Provides more feeling of ownership by Nunavut, the community and/or local HA.

Cons:

- May be perceived to be inequitable in Nunavut since southern harbours were not developed and are not being maintained under this policy.
- Open to disputes should there be construction problems or cost overruns.
- Loss of DFO-SCH specialized engineering and management expertise.
- More administratively cumbersome process.
- Overall a more expensive option for the above reasons. It is estimated that costs under this option could be 10% to 30% higher.

The Working Committee is concerned that Nunavut would accept any offer of assistance to address its urgent need for harbours even though it lacks the resources to maintain the harbours (ED&T 2005/06 capital budget is $2.5 M of which $2.0 M is for airports and $0.5 M is for all other assets). Nunavut may be forced at a later date to divert scarce financial resources from other important budget items, such as healthcare, housing, education, etc. to maintain the harbours. If SCH were to attempt to avoid this possibility by making monies available in perpetuity to maintain the harbours, it would be defeating the intent of its policy of divesting ownership of harbours to the Territory.

7. PROJECT FUNDING

7.1. DFO – SMALL CRAFT HARBOURS FUNDING

Simply stated, the mandate of the Small Craft Harbours (SCH) Branch of Fisheries and Oceans Canada (DFO) is "to support the commercial fishing industry by constructing, operating and maintaining harbours". With a $86.1 million, 2005-06 Main Estimates* budget, SCH owns and maintains 1240 harbours (1008 fishing harbours and 232 recreational harbours) across the ten Canadian provinces and the NWT. These DFO-SCH harbours provide infrastructure and services to approximately 90% of Canada's commercial fishing fleet. Besides providing local employment (and enjoyment) opportunities to commercial, subsistence and recreational fishers across the country, SCH harbours support thousands of small and medium marine businesses -- aquaculture, fish processing, eco-tourism, vessel and gear sales, and repair etc. The local DFO-SCH harbour is often the only federal government presence and the only transportation/supply terminus in remote rural and coastal communities.

Other than three small harbours on Great Slave Lake in the Northwest Territories, SCH has to date not been involved in harbour development, ownership or maintenance in the North. Although it operates under highly permissive legislation (Fishing and Recreational Harbours Act), SCH's harbour development/investment activities in recent years have been largely constrained by budgets. Moreover, it has been the federal government's policy, where practical and feasible, to devolve harbour management and minor maintenance through long term lease agreements to local Harbour Authorities (HAs) -- commercial fishers, local communities and/or other users of the facility. In cases where harbours are not considered a core facility to support the commercial fishery, DFO-SCH may divest ownership.

7.2. NUNAVUT'S FUNDING

While Nunavut lacks the financial ability to significantly contribute to the actual harbour construction and on-going maintenance, it is prepared to make a contribution by providing supporting infrastructure and 'in kind' equity. In this regard Nunavut is prepared to develop and maintain the road and related infrastructure to provide access to the harbour. 'In kind' support would consist of using their staff at no charge to provide on-site advice before and during construction, tender and supervise small site preparation and repair projects, and provide ongoing post-construction inspections, assistance, etc. This 'in kind' support will not be a large burden to Nunavut but will result in significant cost savings to DFO.

7.3. ALTERNATE FUNDING SOURCES

Apart from a private company willing to invest in harbour infrastructure to support a resource extraction project, funding for harbour development in Nunavut communities will depend on the public treasury. Since the Government of Nunavut's financial resources are already stretched to the limit responding to the basic needs of its citizenry, federal funding will be essential in whole or in large part. The Working Committee undertook a fairly comprehensive review of possible

* Main Estimates $86.1 million ($66.1 M A-Base and $20.0 M B-Base)

funding sources/programs within the federal government to finance harbour development in Nunavut (see Appendix C). Federal funding programs with access criteria possibly applicable to harbour infrastructure development in Nunavut include, but may not be limited to:

- Indian and Northern Affairs Canada (INAC), Northern Economic Development
- Infrastructure Canada
  - Strategic Infrastructure Fund (SIF)
  - Infrastructure Canada Program (ICP)
  - Municipal Rural Infrastructure Fund (MRIF)
- Transport Canada
- Fisheries and Oceans Canada, Small Craft Harbours (SCH).

The above-noted federal funding programs are all targeted to infrastructure development. The Working Committee did not rule out Infrastructure Canada, Transport Canada or Indian and Northern Affairs Canada as a source of funding for northern harbour development. However, it recognized that many of their programs are currently over-subscribed, require matching funds from the applicant which Nunavut cannot afford, or their funding criteria are primarily targeted at larger municipal infrastructure projects. Transport Canada appears to be an unlikely candidate to develop and maintain small fishing harbours in the North as its historical mandate has been directed to large, commercial ports and it has been in a divestiture mode for some years now. As the lead federal department in northern issues, INAC would seem to be a logical funder of northern harbour development, however, it does not have any specific programs or monies currently available for such infrastructure projects. The federal government's recently announced Strategic Investments in Northern Economic Development initiative, being led by INAC, could be a funding source in the future.

Given the above-noted analysis, the Working Committee is of the view that based on its mandate and its recognized expertise in constructing, maintaining and operating harbours, DFO's Small Craft Harbours program is the best vehicle to take the lead in this northern harbour development project. At present the SCH program budget is over-subscribed therefore additional funding would have to be obtained to fund Nunavut harbour development.

8. OBSERVATIONS AND RECOMMENDATIONS

8.1. ALIGNMENT WITH FEDERAL INITIATIVES

Harbour development in Nunavut appears to be consistent with current federal government policy, particularly as stated in the Speech from the Throne (April 2006):

> *[The Government] will promote a more competitive, more productive Canadian economy. It will seek to improve opportunity for all Canadians, including Aboriginal peoples and new immigrants.*
>
> *This Government recognizes the unique challenges faced by those who make their livelihood from our land and oceans in our vital natural resource and agriculture industries.*

Harbour development can also contribute to the Government's objectives of working with the provinces and territories on issues of common concern, and assist in keeping Canada's northern borders sovereign and secure.

Further, in its 2004 budget, the federal government committed to spend $90 million over the next five years on northern economic development to ensure that economic development opportunities are pursued in full partnership with, and for the benefit of, northern Canadians, particularly Aboriginal peoples. It was anticipated that these investments would be complemented by other investments to result in total investments in northern infrastructure approaching $200 million over the 5 year period. To this end, inter-departmental and inter-governmental consultations, led by Indian and Northern Affairs Canada (INAC), are currently underway to frame a longer-term economic development strategy for Nunavut, the NWT and the Yukon. When completed, Strategic Investments in Northern Development, will "propose a strategic approach and possible structure under which INAC, in cooperation with partners, could invest the $90 million over the next five years to strengthen sustainable economic development for the North".

8.2. RECOMMENDATIONS

Like roads and highways in the south, safe and accessible harbours are basic and essential infrastructure in the North. They are fundamental to the further development of Nunavut's subsistence and commercial economy at the community and regional level. Fishing, hunting, tourism, resupply, travel and socialization, and national claims to sovereignty will be significantly enhanced by federal investment in Nunavut harbours. In human terms, northern harbour infrastructure development will reduce accidents and deaths, as well as social problems associated with high unemployment levels.

Pursuant to DFO-SCH mandate of supporting the fishing industry, the Nunavut Harbours Working Committee has concluded that:

1. Funding in the amount of $40.4 M over 5 years or $41.25 M over 8 years (including an adjustment for inflation and a 15% or $5.06 M contingency for project overruns and to compensate for any unforeseen habitat impacts) would be required to help achieve the development of the seven harbours requested by the Government of Nunavut.

2. DFO, with the anticipated support of Nunavut, INAC, TC, and IC, would need to seek the required federal funding as it is not available within current allocations.

3. A $1.5 M A-Base increase be phased into the DFO-SCH program to cover ongoing maintenance costs if harbours are constructed.

4. Construction of the seven Nunavut harbours occur under the DFO Small Craft Harbours program beginning in 2006/07. Nunavut's preferred implementation schedule is 5 years.

5. Special funding flexibilities similar to Industry Canada's be provided whereby this is considered one project with a 5 to 8 year time frame in order to facilitate annual carry forwards. Contracts for the construction of all seven harbours would be awarded to only 1 or 2 contractors to optimize cost effectiveness and operational efficiency.

6. A comprehensive investigation be undertaken to determine the most suitable tendering method to meet federal and Nunavut objectives.

7. DFO-SCH assume post-construction responsibility for major maintenance costs while the Government of Nunavut, the local communities and/or Harbour Authorities be responsible for harbour operations and minor repairs.

8. The Government of Nunavut will develop and maintain access infrastructure to the harbour and provide other 'in kind' support.

9. The Government of Nunavut, the community and/or a local HA operate the harbours and assume responsibility for upkeep and minor repairs.

8.3. CONCLUDING COMMENTS

In many respects, Nunavut's adjacent coastal waters represent the world's last fishery frontier, and one of the few readily exploitable renewable resources of significant commercial interest to the Territory. Although present fishing quotas are not fully under Nunavut control, nor is the magnitude and sustainable level of the resource fully delineated by science, the Territory's adjacent waters are known to contain commercial quantities of arctic char, turbot (Greenland halibut), shrimp (northern and striped), and possibly other resources such as cod, scallops, clams, crabs, snails, seaweed etc. For Nunavummiut to fully and safely capitalize on this renewable resource and create sustainable, non-governmental employment (and acquire related life skills, employment training and entrepreneurial attitudes), Inuit communities require infrastructure: harbours, docks, boats, gear, processing facilities, know-how and greater access to their own fishery.

That being said, it must be recognized that the Nunavut fishery is in transition. Prior to 1980, Nunavummiut were largely unorganized subsistence harvesters and hence had little interest in, or awareness of, the region's adjacent marine resources. Today, 25 years later, their homeland is a defined legal entity and an equal partner in a national federation of ten provinces and three territories. Rather than being wards of the state, Nunavummiut increasingly see themselves as masters of their own house. They see their coastal waters and its abundant marine life as theirs. It's no longer just a source of food to feed the extended family, it's also a potential

generator of wealth for their citizens. Not surprisingly, Nunavummiut want to take back ownership and control of this resource under the principle of "adjacency" fishing rights which is well recognized in regional and national fisheries around the world. Nunavut's demand for higher fish quotas, improved harbours, modern fish processing plants, factory freezer trawlers, high-tech fishing gear and management know-how should be seen as part of a natural evolution to province-hood.

The Nunavut fishery itself is in transition from subsistence to commercial and from traditional to modern. As a direct result of harbour development, the Working Committee envisions a two-part, gradual restructuring of the commercial fishing industry. Firstly, a shift where the off-shore fishery reduces its non-productive transportation time by transferring its catch to a Nunavut private sector cold storage facility for later trans-shipment directly to market via a reefer ship. Secondly, a shift of perhaps 20% of the current offshore quota, largely controlled by southerners, to an inshore fishery controlled by Nunavummiut. Instead of a few large, primarily non-Nunavut factory freezer trawlers delivering their catches to Greenland, Atlantic Canada or China for further processing, many small locally owned and operated boats will be delivering their catches to onshore processing plants.

Provision of safe, functional harbours is the next step to making this happen and achieving the economic spin-off of jobs, skills training and capacity building.

Appendix A

Community Profiles

CHESTERFIELD INLET/ IGLULIGAARJUK

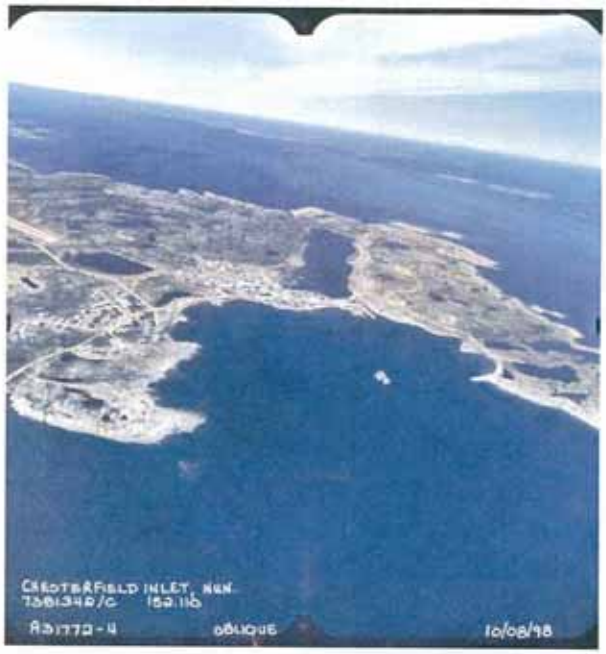
HAMLET

"place with few igluit (igloos)"

COMMUNITY PROFILE

Location: 63°20'N, 90°42W
Population: 330; 97% Inuit *

Chesterfield Inlet is the oldest continuing community in the Kivalliq (Eastern Arctic) region. It is an important historical community as the first RCMP and Hudson's Bay trading posts were built nearby and the Roman Catholic Mission served as the first school for the Inuit. The Chesterfield Inlet Historic Trail is a walking trail through the early years of the settlement. Currently, the community has many modern structures including houses, a nursing station, a school, a Co-op store, and a Northern Store. Residents fish for char in the summer with nets in the inlet, and for lake trout and char in the spring out at the nearby lakes. Chesterfield Inlet has a small fish processing facility; however, it currently requires some repairs. The arctic char is therefore being processed at the Rankin Inlet fish plant for shipment to the South.



* Population information taken from 2001 Community Profiles on www.statscan.ca

Project Description:

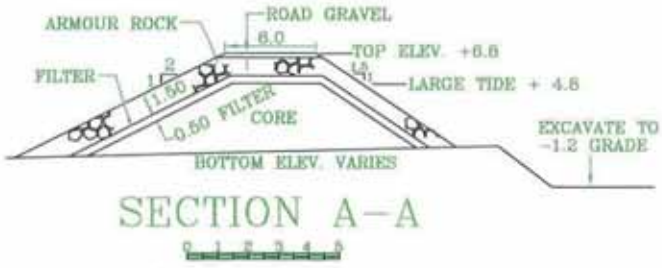
Chesterfield Inlet currently has a rubble mound eli-shaped breakwater with a timber crib wharf built into it. Unfortunately the wharf, which was designed for loading and off-loading vessels, lacks sufficient depth at low tide and is too short for some vessels.

In consultation with the community it has been decided that the existing breakwater would be extended into deep water. Particular attention will be given to the breakwater design so armour will not move during severe storms. A 20 metre crib wharf will be constructed with a 2.0 metre access channel and basin.

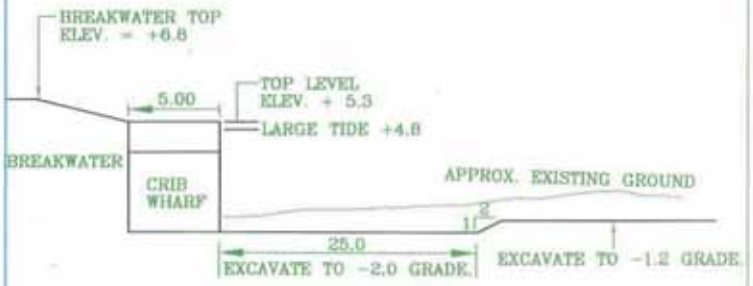
To accommodate the fishing vessels two sets of floating docks are proposed. Firstly, approximately 30 metres of floating wharves will be constructed for intermediate sized vessels. Secondly, a series of smaller floating wharves will accommodate 48 smaller vessels. Additional floating wharves can be installed without modifying the breakwater. In addition a launch ramp and marshalling area are included in the project.

Construction Budget: (in $000s)

Breakwater	Dredging	Wharf	Floats	Marshalling Area & Launch Ramp	Engineering & Design	Project Management Fees	TOTAL
1,100.0	1,170.0	350.0	210.0	150.0	298.0	298.0	3,576.0



SECTION A–A



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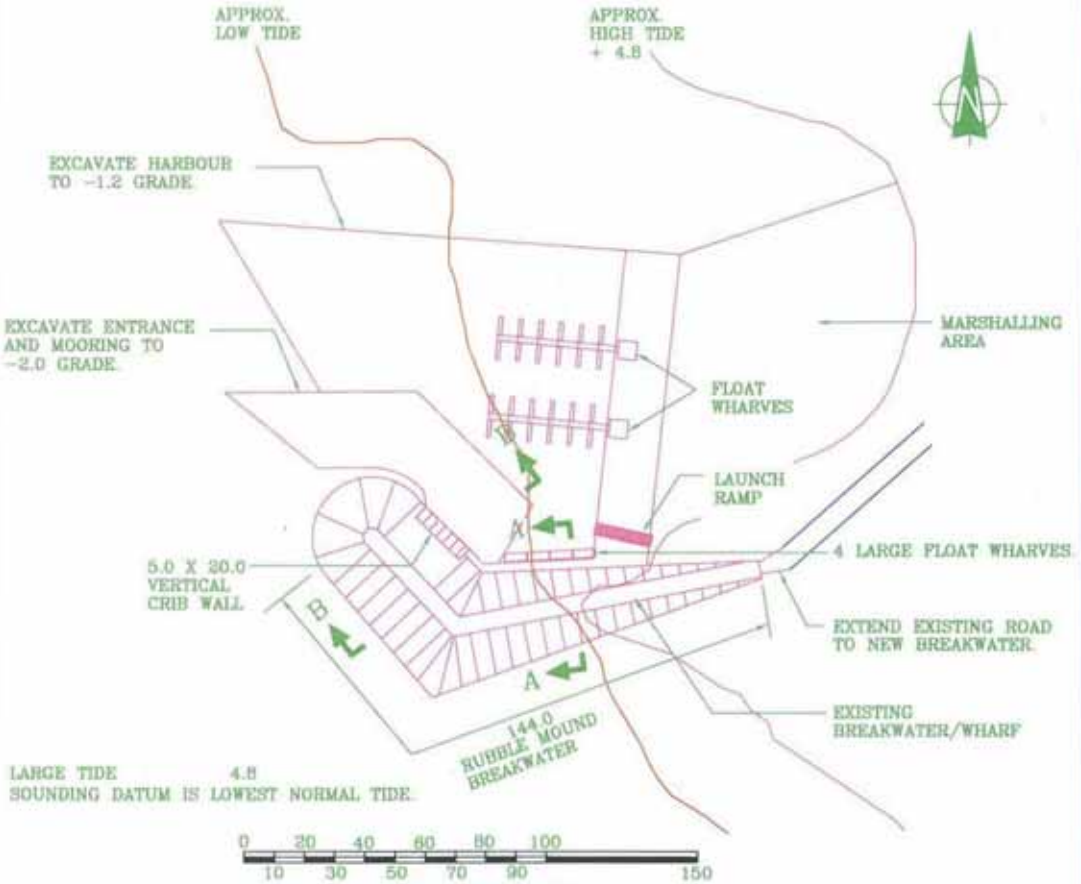


SITE PLAN

CHESTERFIELD INLET, NUNAVUT
HARBOUR DEVELOPMENT

Public Works and Government Services Canada
Travaux publics et Services Gouvernementaux Canada

Western Region

drawing title
SITE PLAN AND SECTIONS

designed by	PWGSC	DEC/04 date
drawn by	RZ	DEC/04 date
approved by		date
413853 project number		W-1 of 1 drawing number

CLYDE RIVER/ KANGIQTUGAAPIK

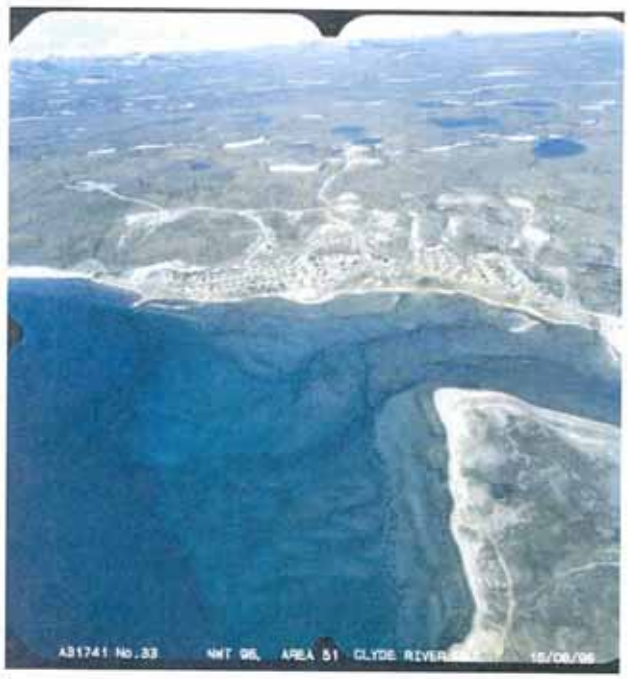
HAMLET

"nice little inlet"

COMMUNITY PROFILE

Location: 70°28'N, 68°35W
Population: 785; 95% Inuit *

Located on the Eastern side of Baffin Island, Clyde River is a community with a growing population. The community has a school, community hail, health center, church, airport and new arena. The residents experience 24-hour sunshine for approximately three months in the summer and 24-hour darkness for about two months in the winter. Clyde River is known for its beautiful scenery as glaciers and icebergs surround the region. Although hunting and camping remain major spring and summer activities, handicrafts and government jobs have become the most important sources of income. Many carvers in the region work with whalebone, soapstone, granite, antler and ivory. Fishing for arctic char is particularly good from mid-July to mid-August.



* Population information taken from 2001 Community Profiles on www.statscan.ca

PROJECT DESCRIPTION:

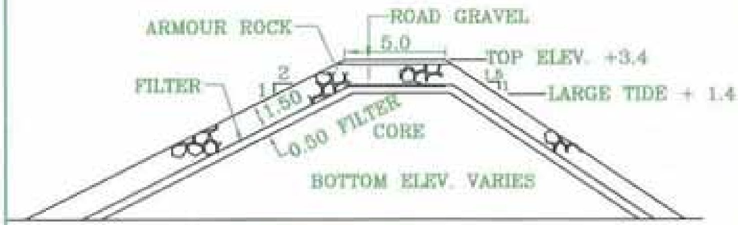
This community has an existing 100 metre pushout perpendicular to the shoreline with a launch ramp. The structure is primarily used by the sealift and provides limited berthing to vessels moored offshore.

After reviewing three concepts the community chose to construct a basin west of the existing groin to avoid problems with littoral drift and to have a short channel to deep water. The proposal involves extending the existing groin with a 137 metre rubble mound breakwater and constructing a second 125 metre rubble mound breakwater.

To accommodate the 60 – 65 metre turbot trawlers operating offshore, a 20 metre crib wharf with two deadman mooring anchors will be built into the breakwater. Two sets of floating wharves are proposed with approximately 30 metres larger wharves for 11 – 15 metre vessels and a series of smaller floats that will accommodate 48 7— 9 meter vessels. The harbour concept allows for expansion to accommodate future needs within the proposed breakwaters configuration.

CONSTRUCTION BUDGET: (IN $000S)

Breakwater	Dredging	Wharf	Floats	Marshalling Area & Launch Ramp	Engineering & Design	Project Management Fees	TOTAL
1,600.0	570.0	400.0	200.0	0.0	277.0	277.0	3,324.0



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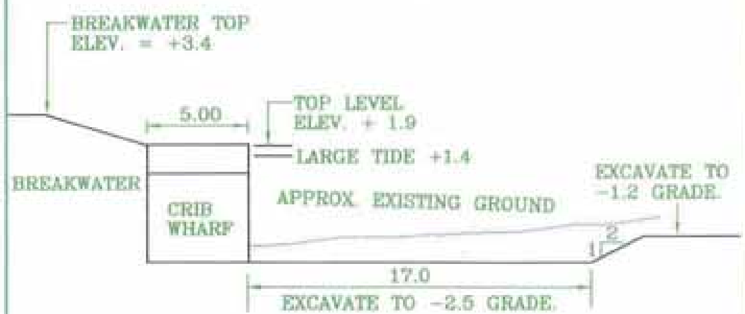

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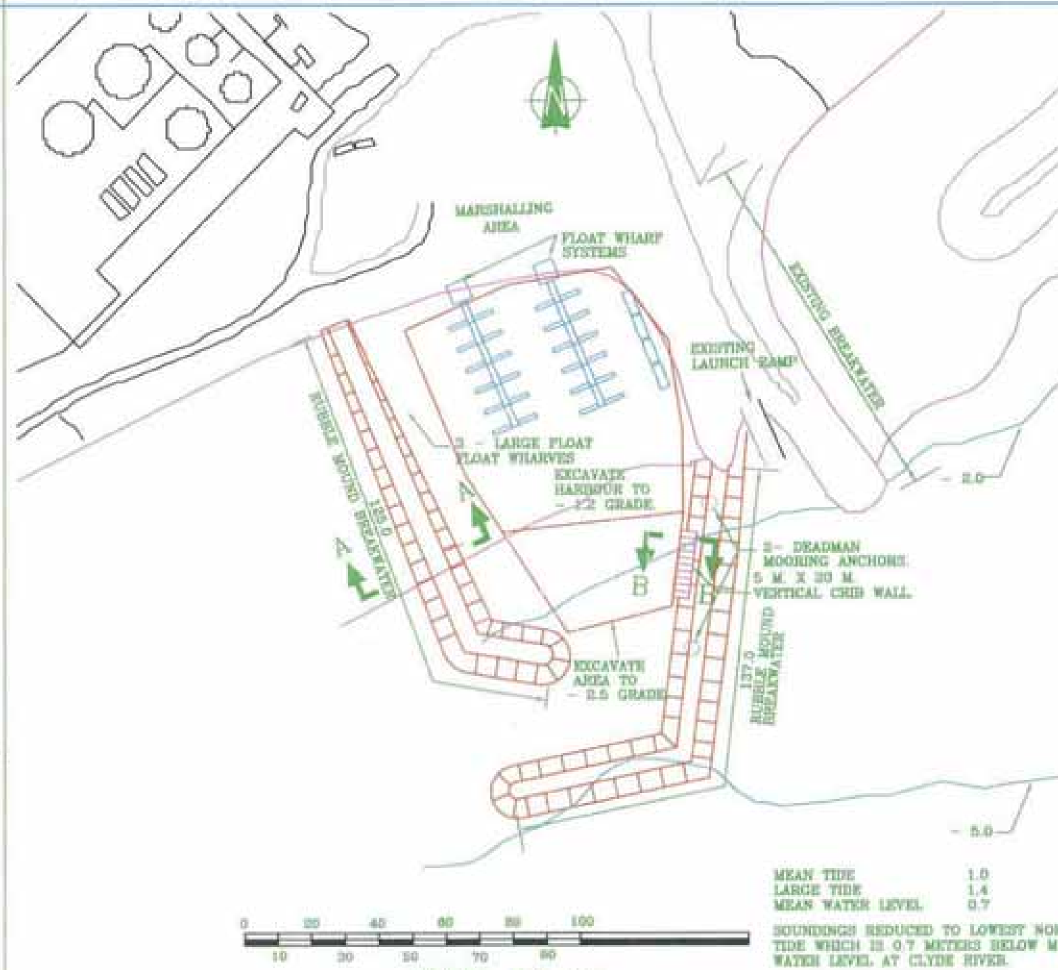


MEAN TIDE	1.0
LARGE TIDE	1.4
MEAN WATER LEVEL	0.7

SOUNDINGS REDUCED TO LOWEST NORMAL TIDE WHICH IS 0.7 METERS BELOW MEAN WATER LEVEL AT CLYDE RIVER.

SITE PLAN

CLYDE RIVER, NUNAVUT HARBOUR DEVELOPMENT

Public Works and Government Services Canada
Travaux publics et Services Gouvernementaux Canada

Western Region

drawing title: SITE PLAN AND SECTIONS

designed by PRGSC — DEC/04 date
drawn by EI — DEC/04 date
approved by — date

413853 project number

W–1 of 1 drawing number

KUGAARUK/ PELLY BAY

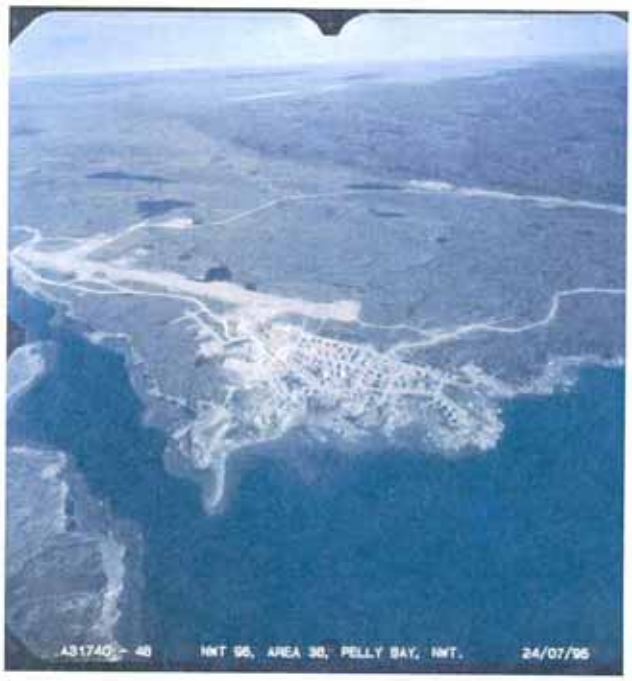
HAMLET

(refers to a river flowing through the community that is used for fishing and to supply water)

COMMUNITY PROFILE

Location: 68°31'N, 89°49W
Population: 600 individuals; 96% Inuit *

Kugaaruk has remained a very traditional Inuit community due the fad that ice jams around the islands guarding the bay's mouth made access almost impossible. However, the sea ice melts and gives way to open water from July to September. The community has a health center, a store, a school, an arena and a small community gym. The area is known for its excellent seakayaking as there are many lakes and rivers nearby. The Kalit River is a major source of fish for the community, especially Arctic char.



* Population information taken from 2001 Community Profiles on www.statscan.ca

PROJECT DESCRIPTION:

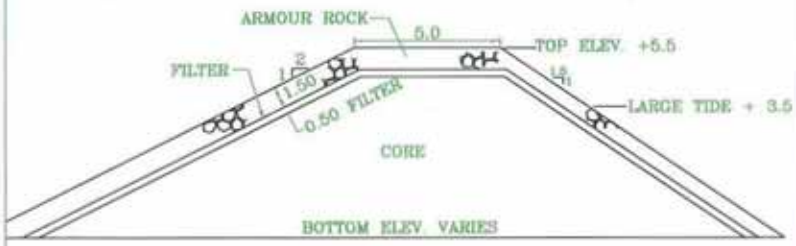
This community has no harbour infrastructure other than a graded beach developed for sealift purposes.

The selected concept takes advantage of a natural groin. Two rubble mound breakwaters, 252 and 218 metres in length, will provide a safe harbour. A 20 metre crib wharf will be constructed to permit loading and offloading of vessels. Approximately 30 metres of large floating wharves will accommodate intermediate sized vessels that would be used in an inshore commercial fishing fleet. The concept includes provision of 72 berths for 7 – 9 metre vessels by installing a series of smaller floating wharves, constructing a launch ramp, marshalling area, and routing road access around a historic site.

This concept permits installation of additional berths within the proposed breakwater configuration to meet future needs.

CONSTRUCTION BUDGET: (IN $000s)

Breakwater	Dredging	Wharf	Floats	Marshalling Area & Launch Ramp	Engineering & Design	Project Management Fees	TOTAL
1,700.0	755.0	350.0	290.0	150.0	324.5	324.5	3,894.0



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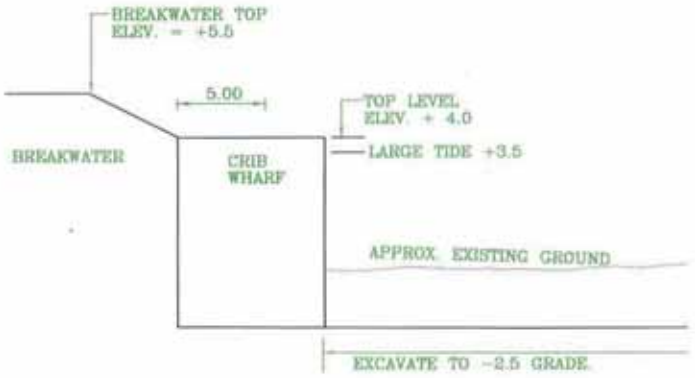

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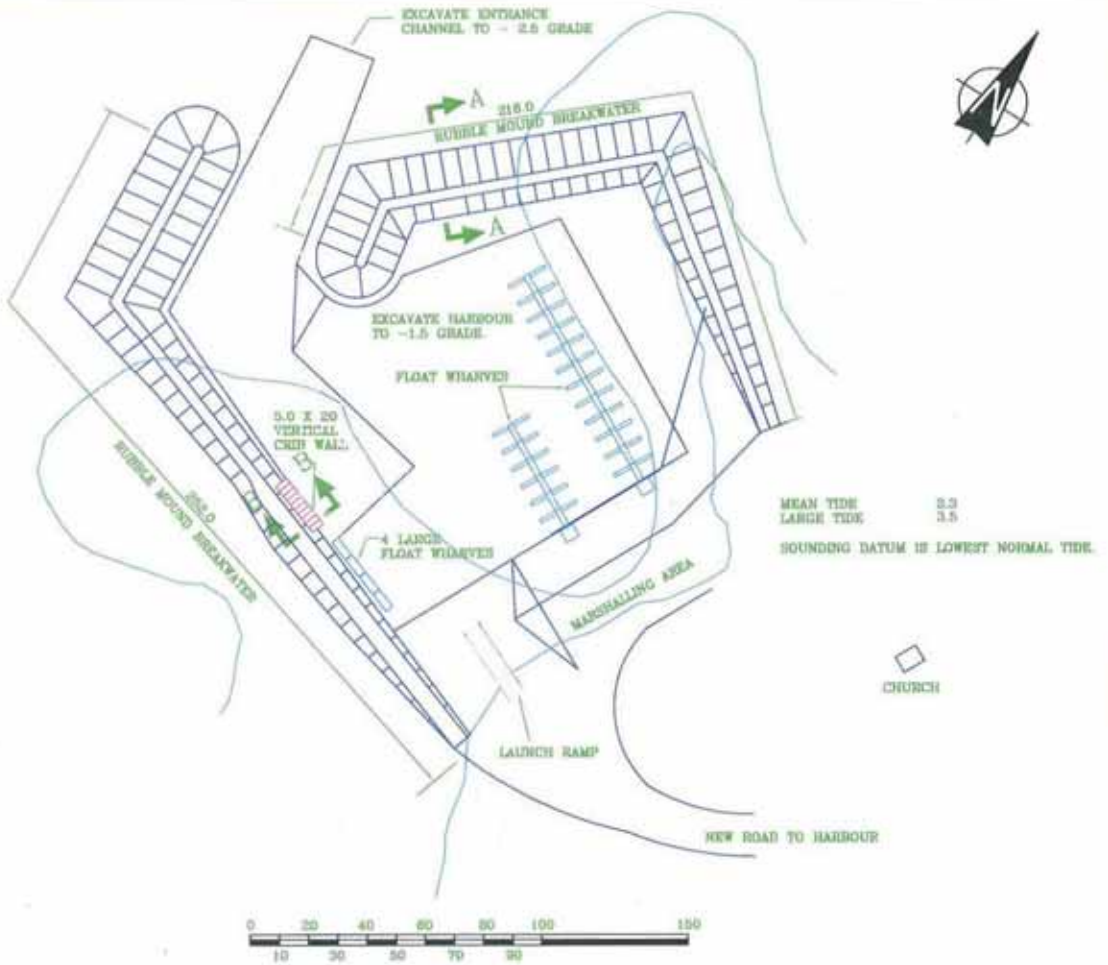


SITE PLAN

KUGAARUK, NUNAVUT
HARBOUR DEVELOPMENT

Public Works and Government Services Canada
Travaux publics et Services Gouvernementaux Canada

Western Region

drawing title
SITE PLAN AND SECTIONS

designed by PWGSC DEC/04 date
drawn by EE DEC/04 date
approved by date

413853 project number
W-1 of 1 drawing number

PANGNIRTUNG/ PANGNIQTUUQ

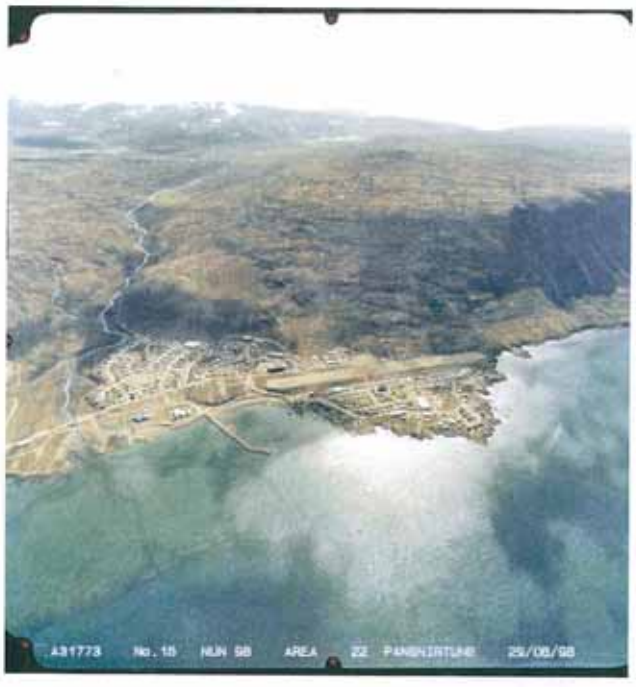
HAMLET

"the place of the bull caribou"

COMMUNITY PROFILE

Location: 66°9'N, 65°43W
Population: 1,280; 94% Inuit*

Pangnirtung is located at the mouth of a river on the Eastern side of Baffin Island, approximately one hour from Iqaluit by air. Pangnirtung is located close to Auyuittuq National Park, a major attraction that is home to Mt. Thor. Pangnirtung is known for its woven tapestries, prints and unique clothing items such as the 'pang hat'. As the community has experienced a rapidly increasing population, employment has become a significant issue. The community currently operates a large fish plant which processes turbot and arctic char with support provided by GN. The Government of Nunavut is also a significant employer in the community.



* Population information taken from 2001 Community Profiles on www.statscan.ca

PROJECT DESCRIPTION:

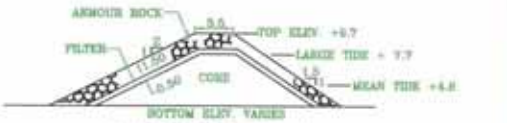
Pangnirtung is home to a modern arctic char and turbot fish processing plant, a 375 metre rubble mound breakwater with a two level fixed wharf. The harbour is situated on a very wide (600 metre) tidal flat and is subject to high winds and waves from the west to northwest direction. Unfortunately the wharf is accessible only by smaller vessels at mid to high tide.

The concept chosen by the community involves constructing a new 110 metre rubble mound breakwater and extending the existing one. The trawlers that currently offload turbot have to anchor offshore and load pallets of fish onto small vessels which carry the product to the wharf at high tide. This very unsafe practice will be eliminated by dredging the channel to provide high tide access for the trawlers. Large vessels will be able to berth during all tide conditions at a new 30 metre crib wharf with two deadman mooring anchors.

The concept includes approximately 45 metres of large floating docks to accommodate a potential inshore fleet. A series of smaller floating wharves are proposed to provide berthing for 72 vessels. Additional floating wharves can be installed within the proposed breakwaters to accommodate future needs. A launching ramp would be constructed and the marshalling area improved.

CONSTRUCTION BUDGET: (IN $000S)

Breakwater	Dredging	Wharf	Floats	Marshalling Area & Launch Ramp	Engineering & Design	Project Management Fees	**TOTAL**
975.0	3,925.0	1,000.0	570.0	100.0	657.0	657.0	7,884.0



SECTION A–A

SECTION B–B

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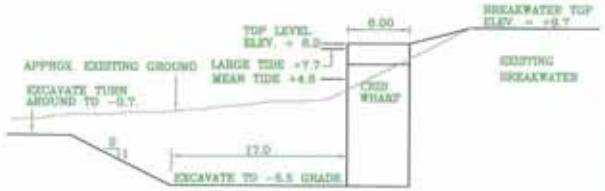

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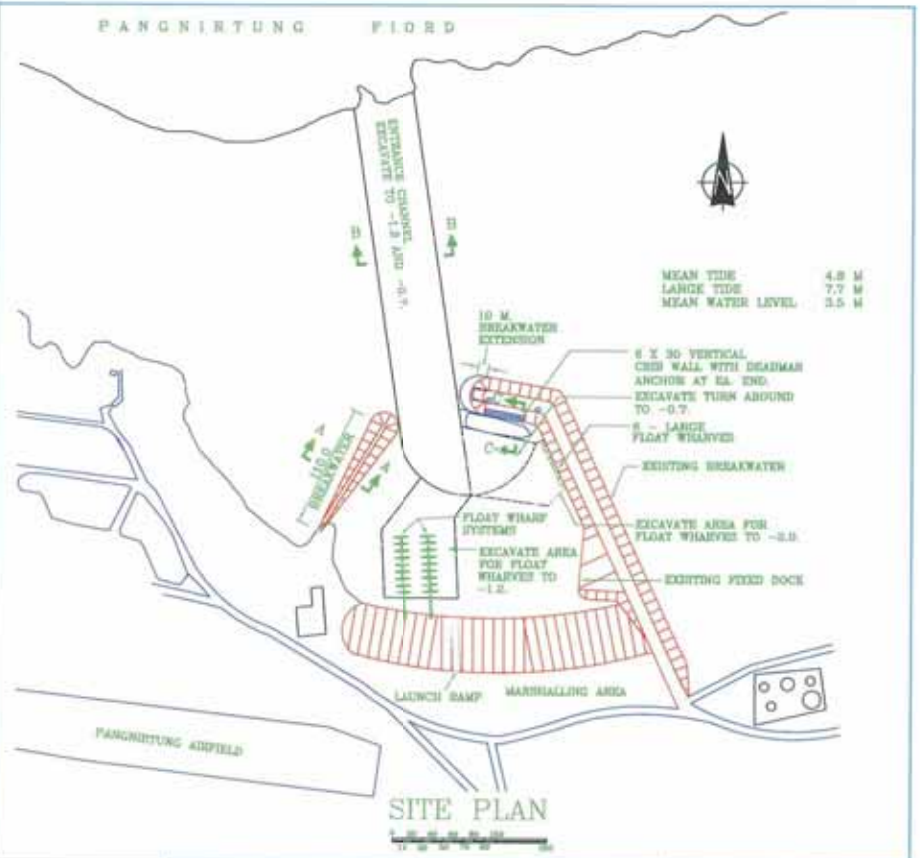


SITE PLAN

PANGNIRTUNG, NUNAVUT
HARBOUR DEVELOPMENT

Public Works and Government Services Canada
Travaux publics et Services Gouvernementaux Canada

Western Region

drawing title
SITE PLAN AND SECTIONS

designed by PWGSC DEC/04 date
drawn by ID DEC/04 date
approved by date

413853 project number
W–1 of 1 drawing number

POND INLET/ MITTIMATALIK

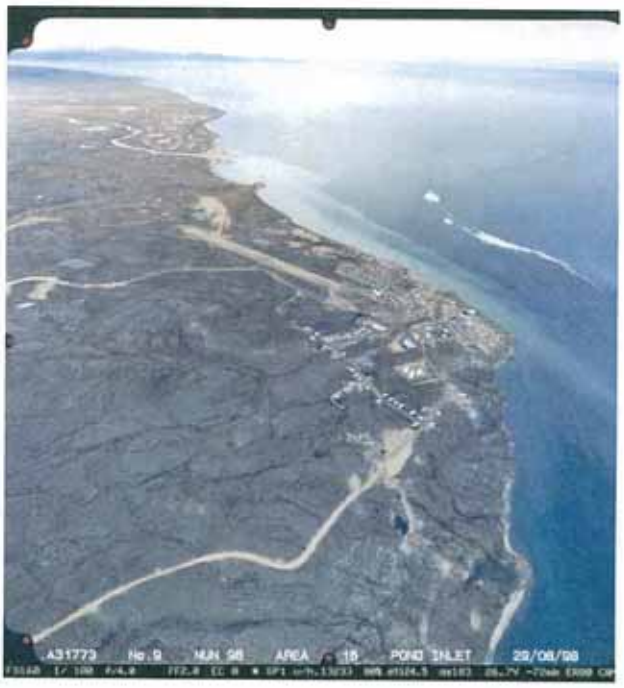
HAMLET

"where there is Mittim (burial place)"

COMMUNITY PROFILE

Location: 72°42'N, 77°58W
Population: 1,220; 94% Inuit *

Pond Inlet, located on the edge of the Eclipse Sound, is the most northern community located on Baffin Island. The community experiences 24-hour daylight from May through August. Since the creation of Nunavut, the community has become a regional center for some GN departments and thus, the GN is a major employer. The community has a school, arena, health center, community hail and airport. Many carvings can be found in Pond Inlet as both green and red soapstone come from local sources. Local artists also produce carvings from ivory, whalebone, and marble as well as wall hangings, pencil carvings and caribou-hair tuftings.



* Population information taken from 2001 Community Profiles on www.statscan.ca

PROJECT DESCRIPTION:

The only structure within the community is a short eli-shaped rubble mound breakwater which has in filled with sand due to littoral drifting processes. The community, on their own initiative, very helpfully retained an engineering firm which developed two harbour concepts that were used in the consultation process.

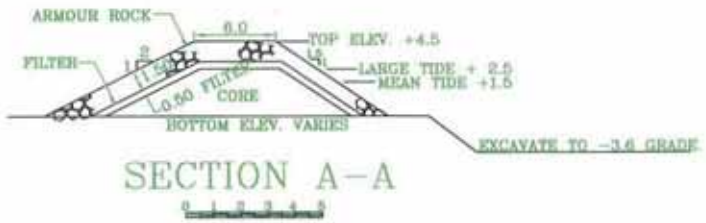
The concepts were slightly modified, after a sedimentation assessment study was completed to a) provide for bypass of sand, thus projecting that redredging will not be required for between 26 and 52 years, and, b) provide for increased protection within the harbour basin.

The chosen concept involves construction of two new rubble mound breakwaters 307 and 209
meters in length. A 30 metre crib with two deadman mooring anchors will permit the 60— 65
metre turbot trawlers to access the harbour at high tide and berth during all tides.

To accommodate a potential inshore fleet of intermediate sized vessels, the concept calls for approximately 45 metres of large floating wharves. The existing 156 vessels will be accommodated with a series of smaller floating wharves and launch ramp. A marshalling area will assist in community resupply.

CONSTRUCTION BUDGET: (IN $000s)

Breakwater	Dredging	Wharf	Floats	Marshalling Area & Launch Ramp	Engineering & Design	Project Management Fees	TOTAL
3,500.0	2,400.0	800.0	450.0	100.0	730.0	730.0	8,760.0



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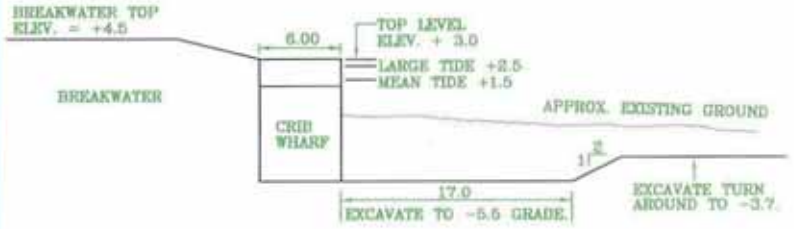

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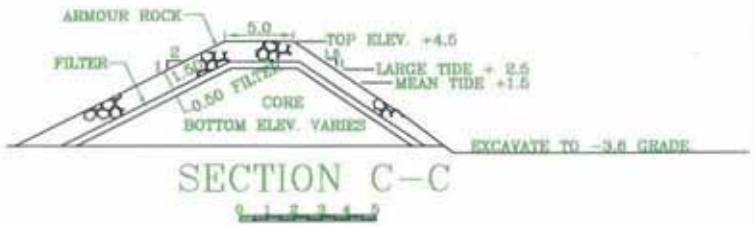

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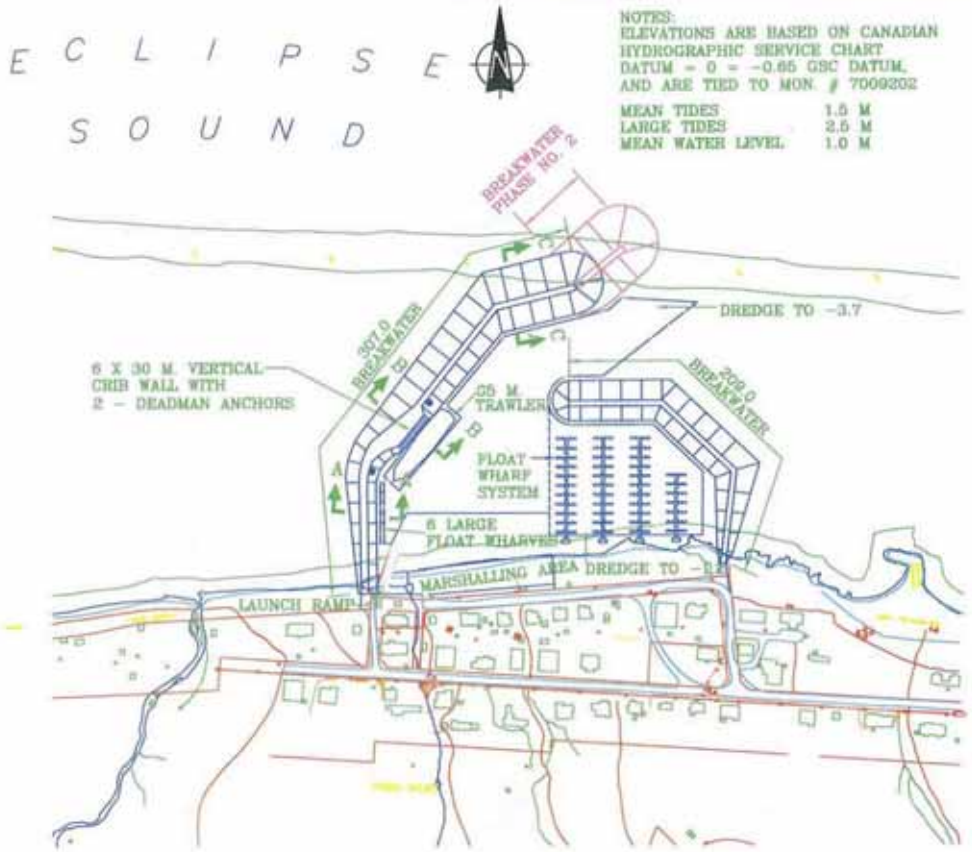


SITE PLAN

POND INLET, NUNAVUT
HARBOUR DEVELOPMENT

Public Works and Government Services Canada
Travaux publics et Services Gouvernementaux Canada

Western Region

drawing title
SITE PLAN AND SECTIONS

designed by PWGSC DEC/04 date
drawn by EC DEC/04 date
approved by date

413853 project number
W–1 of 1 drawing number

QIKIQTARJUAQ

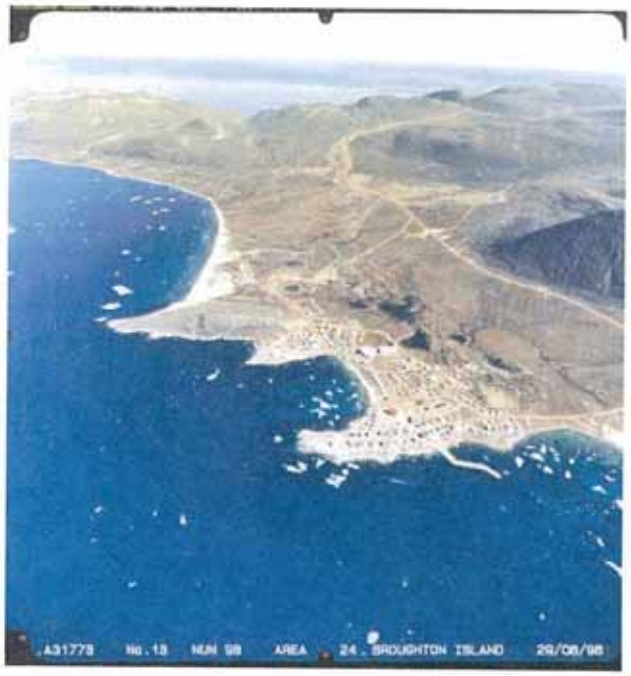
HAMLET

"big island"

COMMUNITY PROFILE

Location: 67°33'N, 64°2W
Population: 520; 95% Inuit *

Qikiqtarjuaq is located on Baffin's East Coast and often referred to as the iceberg capital of the world. Hunting and fishing still play important parts of daily life in the community. Qikiqtarjuaq is the community the tourists use as access to Auyuittuq National Park, which is a source of employment as community members serve as outfitters to help tourists locate hiking areas and provide transport to the National Park. Other sources of employment include boat, dog-team and snowmobile tours. Qikiqtarjuaq is also home to traditional Intuit and modern clothing such as sealskin parkas and kamflt (boots) made by the local Minnguq Sewing Group.



* Population information taken from 2001 Community Profiles on www.statscan.ca

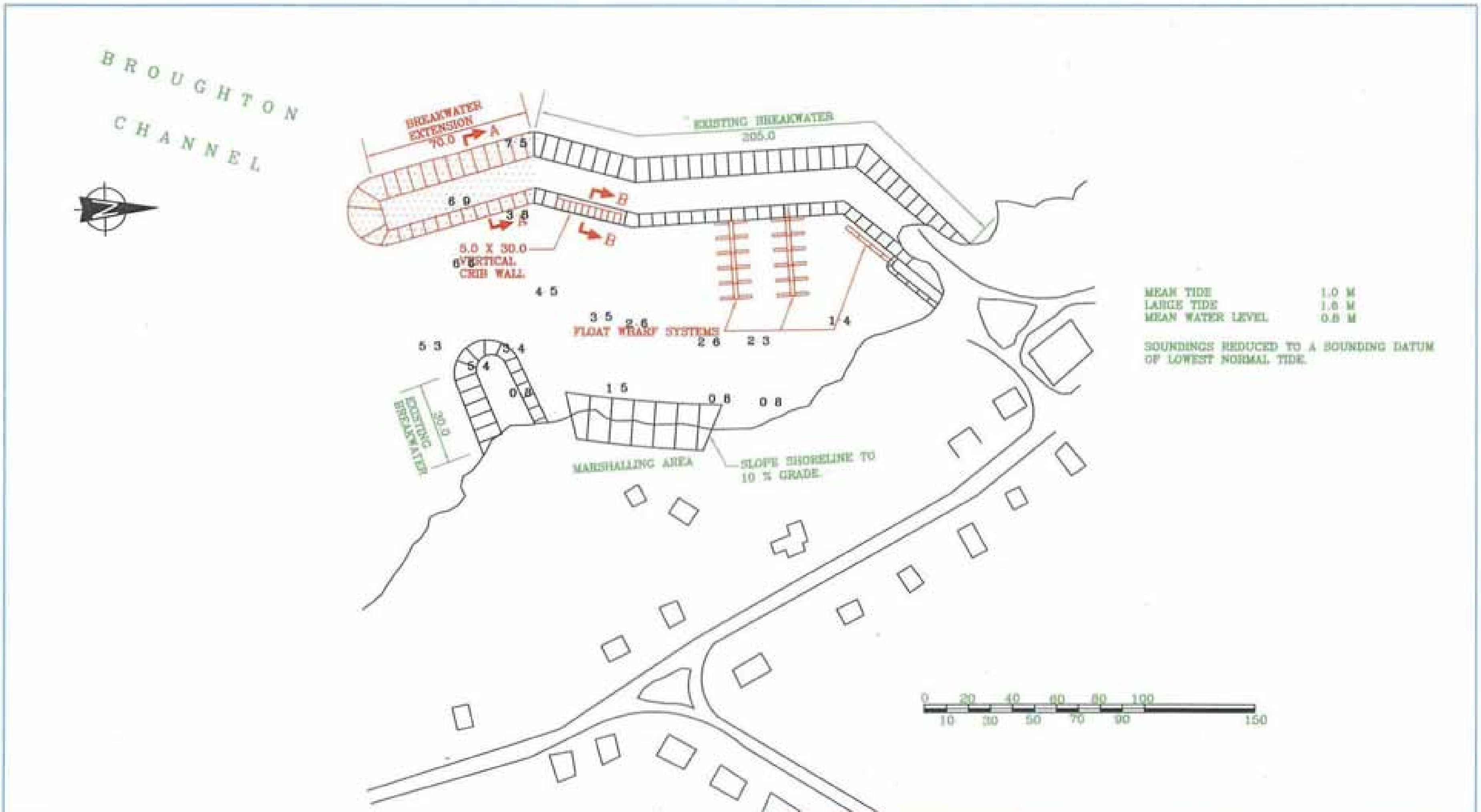
PROJECT DESCRIPTION:

This community has a 205 metre rubble mound breakwater situated in deep water, and a 30 metre breakwater perpendicular to the shoreline. The large breakwater will be extended to prevent waves from entering the harbour basin. To accommodate the large trawlers fishing for turbot and shrimp immediately offshore, a 30 metre wharf with two deadman mooring anchors would be constructed into the breakwater.

To accommodate a potential inshore commercial fishing fleet of intermediate sized vessels, approximately 30 metres of large floating wharves are proposed. The existing fleet of smaller vessels would be berthed at smaller floating wharves. The current concept of providing 48 berths can be expanded to meet future needs within the proposed breakwater configuration. A launch ramp would also be constructed.

CONSTRUCTION BUDGET: (IN $000S)

Breakwater	Dredging	Wharf	Floats	Marshal Ii ng Area & Launch Ramp	Engineering & Design	Project Management Fees	TOTAL
1,100.0	0.0	250.0	180.0	100.0	163.0	163.0	1,956.0



QIKIQTARJUAQ, NUNAVUT HARBOUR DEVELOPMENT

Public Works and Government Services Canada
Travaux publics et Services Gouvernementaux Canada

Western Region

drawing title: SITE PLAN

designed by PMGBC — JUNE/04 date
drawn by SS — JUNE/04 date
approved by — date

413853 project number

W-1 of 2 drawing number

REPULSE BAY/ NAUJAAT

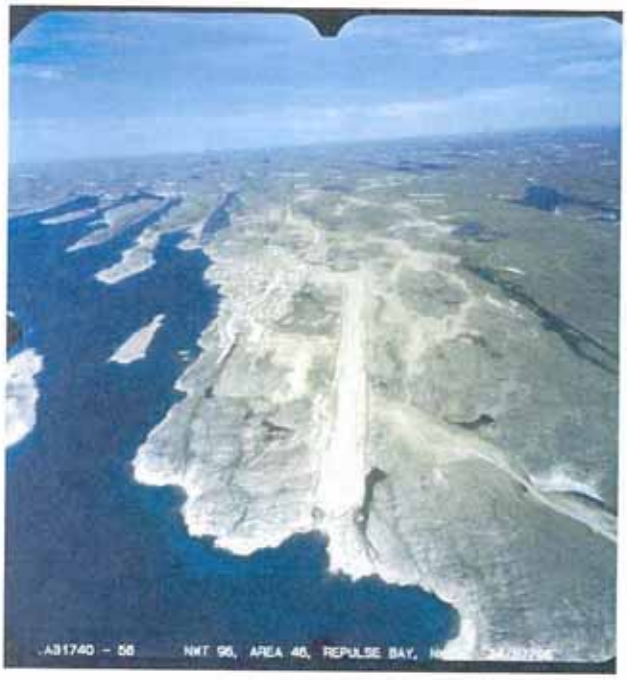
HAMLET

"the place of the baby seagulls"

COMMUNITY PROFILE

Location: 66°31'N, 86°15W
Population: 610; 96% Inuit *

Repulse Bay is the only North American community located on the Arctic Circle. The name of *p/ace of the baby seagulls comes* from the fact that five kilometres north of the community is a cliff where seagulls nest every June. Repulse Bay is also known as the leader (along with Cape Dorset) in terms of carving and the community produced a good number of the best carvers in the 1940s. The Inuit of Repulse Bay thrive on hunting, fishing and trapping as well as the presence of government institutions that hire locally.



* Population information taken from 2001 Community Profiles on www.statscan.ca

PROJECT DESCRIPTION:

This community has no harbour infrastructure other than a beach area used by resupply vessels. The Working Committee met with the community on two occasions to discuss two concepts. The community requested, and the Working Committee agreed, to investigate a third concept.

For the purposes of this report, it should be noted that the estimated costs for the various concepts are similar. It is therefore suggested that the following proposed budget would be sufficient to develop a suitable harbour for the community.

CONSTRUCTION BUDGET: (IN $000S)

Breakwater	Dredging	Wharf	Floats	Marshalling Area & Launch Ramp	Engineering & Design	Project Management Fees	TOTAL
1,600.0	1,200.0	500.0	170.0	130.0	360.0	360.0	4,320.0

Appendix B

Benefits of Small Craft Harbours

Benefits of Small Craft Harbours

Seven Communities in Nunavut

Final Report

Prepared for:

Small Craft Harbours
Fisheries & Oceans Canada
Winnipeg, Manitoba

Prepared by:

GSGislason & Associates Ltd.
Vancouver, BC

January 2005

PREFACE

This report was prepared under contract for Canada Fisheries & Oceans to assess the economic and social benefits of new harbour facilities in seven (7) Nunavut communities.

The consultants have benefited from discussions with DFO, other government, community interests, and others. Notwithstanding this assistance, the authors have final responsibility for the analyses and conclusions of this study.

SUMMARY

Background

- Nunavut has no roads connecting communities, all intercommunity travel must be by air or sea
- the federal government presently has no harbour investments in Nunavut
- the lack of harbour infrastructure is preventing communities from tapping emerging economic development opportunities
- DFO is proposing harbour development for 7 communities – Pangnirtung, Qikiqtarjuaq, Clyde River, Pond Inlet, Repulse Bay, Chesterfield Inlet, Kugaaruk
- study objectives
    - — assess economic impacts of the 7 harbour developments
    - — assess broader social & community benefits

The Investment Strategy

- $34 million capital investment in total for the seven (7) facilities
- build one harbour per year for 7 years or build the seven harbours over 4 years
- engineer and build to higher standards to minimize ongoing O&M costs to community
- use as much local labour, contractors, machinery & equipment as possible

Economic Impacts of Harbour In vestments **(see *attached Exhibit)***

- one time beneficial impacts from $33.8 million harbour construction
    - — $14.4 million GDP
    - — $8.5 million wages & benefits
    - — 173 person-years employment
- annual beneficial impacts from $1.5 million harbour O&M plus $9.3 million increased economic activity ($2.2 million subsistence value, $5.9 million fish sales, $0.9 million tourism, $0.3 million less boat damage)
    - — $7.9 million GDP
    - — $6.3 million wages & benefits
    - — 198 person-years employment
    - — increased human safety, reduced deaths & injuries
- estimates do not include impacts from substantial “upside” activities (e.g., increased access to resources, new fish cold storage/processing)

Social & Community Benefits

- help reduce social problems associated with high unemployment
- stimulate community economic development and self-reliance, reduce social assistance
- provide focal point for community events
- facilitate intercommunity travel, help community resupply
- provide emergency access to/from communities
- help increase federal presence and assert Canada’s sovereignty in the North

Conclusions

- the harbour developments will assist the transition to a mixed subsistence – wage economy
- the harbour investments will reduce community unemployment from 23% to 17%
- the economic, community and intrinsic benefits will enhance the quality of life in Nunavut

Exhibit: Impact Summary for Nunavut Harbour Developments

Community/Impact Measure		Impact Source: Harbour Construction	Impact Source: Annual Harbour O&M plus Economic Activities
Pangnirtung	- GDP $000	3,560	2,610
	- Wages $000	2,100	2,110
	- Employment PYs	43	67
Qikiqtarjuaq	- GDP $000	770	1,310
	- Wages $000	500	1,020
	- Employment PYs	10	30
Clyde River	- GDP $000	1,380	1,270
	- Wages $000	830	990
	- Employment PYs	17	29
Pond Inlet	- GDP $000	3,700	1,660
	- Wages $000	2,150	1,300
	- Employment PYs	43	39
Repulse Bay	- GDP $000	1,810	350
	- Wages $000	1,060	290
	- Employment PYs	21	11
Chesterfield Inlet	- GDP $000	1,540	350
	- Wages $000	900	290
	- Employment PYs	19	11
Kugaaruk	- GDP $000	1,620	300
	- Wages $000	970	260
	- Employment PYs	20	II
All Seven (7)	**- GDP $000**	**4,380**	**7,850**
	- Wages $000	**8,510**	**6,260**
	- Employment PYs	**173**	**198**

Note: 1. Impacts are the sum of direct industry, indirect supplier and induced consumer respending impacts.

2. *One time harbour construction* impacts *flow from the* $33.8 *million construction costs in total - $7.9 million Pangnirtung.* $2.0 *million Qikiqtarjuaq, $3.3 million* Clyde *River,* $8.8 *million Pond Inlet $4.3 million Repulse* Bay, *$3.6 million Chesterfield* Inlet, *$3.9 million Kugaaruk.*

3. Annual impacts flow from the $1.5 million in annual harbour O&M costs and the $5.6 million in annual increased economic activity ($4.5 million fish sales, $0.9 million tourism, $0.2 million less boat damage).

TABLE OF CONTENTS

1.0 INTRODUCTION

Presently there are no federal harbours in Nunavut. The perception is that the absence of a marine transportation system and infrastructure has impeded the operation and development of commercial fishery, subsistence harvesting, tourism/recreation and community supply activities. There are also issues of safety associated with the rudimentary harbour facilities that exist in a few communities. The development of modern harbours in Nunavut communities could provide a catalyst for economic development and improve social and community well being.

The Nunavut Territorial Government has identified seven communities as leading candidates for development of harbour facilities – four in the Qikitaaluk or Baffin Region (Pangnirtung, Qikiqtarjuaq, Pond Inlet, Clyde River), two in the Kivalliq Region (Chesterfield Inlet, Repulse Bay), and one in the Kitikmeot Region (Kugaaruk).

The Small Craft Harbours (SCH) branch of Fisheries and Oceans Canada (DFO) is considering investments in harbour development in these communities. There is a need to assess the beneficial economic and social impacts of such SCH development.

1.1 Nunavut – A Special Case

Nunavut is special within Canada. Nunavut was created in 1999 and is Canada's youngest province or territory. It is the most northern region of Canada with a coastline of over 100,000 1cm, a land mass of 1.9 million square km, and has a population of only 29,000 of whom 85% are Inuit.

All of Nunavut's 26 communities are located on its coastline. The Territory has no roads that connect communities – intercommunity travel by necessity must be by air or water. Accordingly, the Territory loolcs to the marine environment as the key to economic development.

The Territory has a very high unemployment rate, more than double that of Canada as a whole, that makes worse several social problems including alcoholism, crime, and youth suicides. The population has a very young age structure. The economy is heavily reliant on government and government funded social services.

The traditional or subsistence economy is still very important (many families to "live off the land" during the short summer season). Seal, narwhal, and beluga whale hunting are important. However, climate change has induced melting of ice flows and, in some cases, has reduced subsistence opportunities. Climate change also extends the open water season which in turn can create marine-based economic opportunities. But lack of infrastructure including suitable harbour developments is inhibiting the transition to a mixed subsistence – wage economy.

1.2 Study Objectives

The study has two main objectives:

- To estimate the direct and indirect economic benefits of investments in 5CR harbours at the seven (7) locations identified above on the local and regional economies, and

- To access the broader social and community benefits of SCH development at the identified locations.

Exhibit 1: Nunavut Population and Work Characteristics 2001

	Seven Communities							Iqaluit	Nunavut
	Pang-nirtung	Qikiq-tarjuaq	Clyde River	Pond Inlet	Repulse Bay	Chester-field Inlet	Kugaaruk		
Demographics									
(1) Population	1,275	520	785	1,220	615	345	605	5,235	26,745
(2) Population 15+	800	345	450	715	345	215	330	3,745	16,820
(3) Aboriginal Pop^{n}	1,210	495	750	1,145	590	325	575	3,065	22,720
(4) Households	355	140	150	275	130	95	120	1,785	7,170
Work & Earnings									
(5) Employed Labour Force	410	140	180	310	180	125	185	2,750	9,380
(6) Unemployed Rate	22.9 %	25.6%	25.0%	25.3%	28.0%	17.2%	14.0%	8.9%	17.4%
(7) Persons with Earnings	600	230	310	485	245	170	265	3,125	12,355
(8) FY, FT Workers*	155	60	70	130	70	55	85	1,775	5,080
(9) Equipment Operators	100	25	50	85	50	35	45	395	1,935
(10) Average Household $	35,970	30,140	44,160	41,630	39,170	40,190	47,490	69,650	45,440
(11) Share – Earnings	74%	78%	70%	76%	70%	82%	75%	92%	84%
(12) - Transfers	22%	20%	28%	20%	24%	15%	18%	5%	13%
(13) - Other	4%	2%	2%	4%	6%	3%	7%	3%	3%

** Full year, full time workers*

Source: Census of Canada 2001.

1.3 Work Plan

The workplan included both primary/interview and secondary data collection. The consultant interviewed 27 individuals – the Economic Development Officer (EDO) in each of the seven communities and 20 others from the Government of Nunavut, DFO, fisheries organizations and companies, etc. (see Appendix A).

The consultant also spent 5 days in Nunavut – Iqaluit, Pangnirtung and Pond Inlet – in late October 2004 to attend Fisheries Strategy Consultations and to participate in community meetings called to solicit views on harbour development.

More than 20 reports were reviewed. The consultant also worked closely with DFO Small Craft Harbours Branch in Winnipeg in detailing the costs of harbour construction and operation – see Appendix B.

1.4 Report Outline

The next section presents a profile of existing harbour/dock facilities and marine-related economic activity in Nunavut. The remaining sections of the report are:

Section	Type
2	Existing Facilities & Activity
3	Harbour Investments & Impacts
4	Stimulated Economic Activity & Impacts
5	Community & Social Benefits
6	Conclusions

Appendices provide additional data and analysis.

2.0 EXISTING MARINE FACILITIES & ACTIVITIES

This section profiles existing marine facilities in the seven (7) communities of interest. The section also profiles subsistence, commercial fishing, and tourism activities for Nunavut.

2.1 Existing Marine Conditions and Facilities

Exhibit 2 outlines the marine environment, marine facilities and marine activities/businesses in the seven communities. The following are notable:

- Pangnirtung, Repulse Bay and Chesterfield Inlet have large tides, the other communities have more moderate tides
- the open water season is about 4 months long in each community
- Pangnirtung is the only community that presently has a real dock although the dock is accessible only to small vessels and only at half or higher tide (it has no floats), the facility in Chesterfield Inlet is very rudimentary
- close to 500 boats exist in the seven communities in total, with over 97% of them being under 8m (26 fleet/in length)
- all communities use the ocean for subsistence travel, either directly to hunt for seals and narwhal or indirectly to travel to land-based caribou hunting grounds, for example;
- commercial char fishing occurs in most communities, commercial turbot fishing occurs only in Pangnirtung although large vessels from southern Canada do fish turbot in waters adjacent to Nunavut (Pangnirtung has the only fish processing plant of the seven)
- marine tourism is in its infancy in the communities

2.2 Subsistence Harvesting

The Nunavut Wildlife Harvest Study has produced estimates of subsistence harvests, by community, of terrestrial animals (e.g., caribou), marine mammals (e.g., seals, narwhal, beluga), birds & waterfowl, and fish (mainly Arctic char) — see Exhibit 3.

Clearly subsistence harvesting is an important source of food to all seven communities. For example, Inuit women in Kugaaruk have reported that, subsistence meat, birds and fish accounted for 60% of total consumption of meat, birds and fish (Lawn & Harvey, n.d.). Subsistence harvesting also provides very important social and cultural benefits to Inuit people through:

- Distribution — sharing of food among an extended family and the community
- Cultural expression and continuity — providing linkages to traditional lifestyles and ancestors
- Socialization — integrating young people into work roles and the community

These non-economic benefits are substantial and may even exceed the benefits of subsistence as a food source. Subsistence harvesting also contributes to Inuit Qaujimajatuqangit or Inuit knowledge (IQ).

Exhibit 2: Overview of Marine Facilities in 7 Nunavut Communities

	Seven Communities						
	Pang-nirtung	Qikiq-tarjuaq	Clyde River	Pond Inlet	Repulse Bay	Chester-field Inlet	Kugaaruk
Marine Conditions & Facilities							
Tides	7.7m	1.6m	1.4m	2.5m	5.8m	4.8m	3.5m
Facilities – Landing Beach	Gravel	Sand	Gravel	Sand	Gravel	Sand	?
- Public Dock	Yes	No	No	No	No	Pushout	No
No. Boats in Community**	~150	~110	~40	~150	~30	~25	~45
Existing Marine Activities							
Subsistence	X	X	X	X	X	X	X
Commercial Fishery – Char	X	X	X	X	*	X	X
- Turbot	X	X	X	X			X
Marine Tourism	X	X	X	X			X

** Community has informal sales to friends & relatives who visit the community*
*** The open water season is about 4 months in each community*

Source: LPS Aviation et al "Nunavut Transportation Study", interviews with Economic Development office rand Al Kathan DFO Small Craft Harbours pers. comm.

2.3 Commercial Fisheries

Nunavut has commercial fisheries for Arctic char, turbot, shrimp and clams in and adjacent to its territory. The commercial fishery has harvesting and processing components.

Arctic Char

Arctic char is harvested from over 80 rivers/lakes during summer, using gillnets deployed from small skiffs or using weirs, and from under the ice during winter. The fish are delivered to three main processing points – the Pangnirtung Fisheries plant in Pangnirtung, Kitikmeot Foods plant in Cambridge Bay, and Keewatin Meat and Fish plant in Rankin Inlet. A variety of fresh dressed head-on, filleted, and smolced products are air freighted to southern Canada distribution centres such as Ottawa, Montreal, and Edmonton or sold within the North.

The commercial char quota over all Nunavut water bodies is about 360,000 kg (360 tonnes) – only about 25% of this is caught in a year. The domestic harvest of char is about 400 tonnes i.e., the vast majority of char is utilized in the domestic fishery.

No precise figures are available by community but it is thought that half or more of the total commercial char catch comes from fishermen in the seven communities of interest.

Turbot

The North Atlantic Fisheries Organization or NAFO makes recommendations on sustainable harvest levels of turbot in Subarea 0 (north subdivision OA and south subdivision B). The Division 08 commercial quota accruing to Canada since the late I 990s has been 5,500 tonnes – 1,500 tonnes to Nunavut residents, 2,500 tonnes to company quotas, and 1,500 tonnes to a competitive fishery. The Division OA experimental fishing quota accruing to Canada since 2002 has been 4,000 tonnes, all of which was allocated to Nunavut. In 2003 and 2004 Nunavut got an extra 400 tonnes of turbot OA quota since Greenland did not take all their quota.

The Minister of Fisheries and Oceans makes the allocation within the Canadian OA and OS aggregate quotas. The Minister has delegated the allocation of the 4,000 tonne OA and 1,500 tonne OB Nunavut quotas to the Nunavut Wildlife Management Board (NWMB). The Board has provided the allocation to the Baffin Fisheries Coalition or BFC who in turn has brokered the quota to Canadian and foreign fishing vessels in return for royalty and crew positions.

There is a small inshore winter longline fishery carried out by Pangnirtung residents that amounted to only about 50 tonnes in the last year. This catch level is much less than that in the mid l990s – ice conditions have led to reduced inshore catch e.g., late ice formation, unstable use, early ice melting.

The inshore winter turbot catch plus about 400-500 tonnes of offshore turbot caught by factory trawlers is processed at the Pangnirtung Fisheries plant. Money to purchase offshore turbot raw material comes from royalty payments i.e., the plant essentially gets the raw material at zero cost (Brubacher 2004). The turbot is processed into fillets which are flown to Montreal for distribution to market. Under a Fish Freight Subsidy program, the Government of Nunavut pays half the cost of freighting fish from Pangnirtung to Iqaluit and part of the air freight cost from Iqaluit to Montreal.

Shrimp

There are currently 17 offshore licences for shrimp fisheries adjacent to Nunavut with about 25% of the quota allocated to the NWMB. This Nunavut quota is leased to and fished by non-Nunavut companies in return for royalty payments as well as employment and training opportunities. None of the product is processed in Nunavut at present.

Clams & Other

Commercial fishery for clams is an experimental fishery. The catch has never exceeded about 5 tonnes, well short of the 55 tonne annual experimental quota, and in fact has been less than the 5 tonne benchmark in recent years.

Some test fishing for starry flounder has been conducted.

Exhibit 3: Nunavut Hunter Participation & Harvest Estimates 5 Year Average 1996/97 to 2000/01

	Seven Communities						
	Pang-nirtung	Qikiq-tarjuaq	Clyde River	Pond Inlet	Repulse Bay	Chester-field Inlet	Kugaaruk
Number of Hunters	192	135	213	304	157	79	79
Terrestrial Mammals							
Caribou	2,098	120	349	1,828	745	655	430
Muskox	0	0	0	1	<1	1	6
Polar Bear	12	13	9	18	12	9	13
Wolf	9	<1	3	13	31	42	15
Fox	15	10	39	55	171	82	51
Arctic Hare	76	24	55	105	5	4	<1
Other	0	0	0	0	6	1	2
Marine Mammals							
Seals	6,585	3,007	2,038	2,172	433	105	411
Walrus	16	4	<1	5	7	3	0
Narwhal	34	25	20	119	45	1	6
Beluga	35	1	<1	1	23	17	6
Bowhead	<1	0	0	0	<1	0	0
Birds/Waterfowl							
Geese	92	64	128	550	12	118	6
Ptarmigan	1,422	260	1,214	926	3	93	3
Other Birds*	1,298	133	142	38	32	8	5
Bird Eggs	2,352	346	373	4,098	11	169	20
Fish							
Arctic Char	35,065	8,350	8,463	12,114	4,283	2,481	10,294
Other Fish**	5,914	57	2,167	53	357	264	618
Clams	1,001	20,353	9,331	1	0	0	0
Mussels	0	571	0	0	0	0	0

** Mostly eider duck*
*** Mostly turbot and sculpin*

Source: Heather Priest and Peter J. Usher, "The Nunavut Wildlife Harvest Study", August 2004.

2.4 Tourism

No reliable statistics on tourism activity for Nunavut exist. It is thought that tourist visitation ranges from 3,000 to 6,000 individuals who spend from $6 to $12 million annually (Blackstone 200 I, Gislason 2003) – these figures exclude business travellers and associated arts & craft purchases. About a third of the total expenditures flow from sport hunting packages, particularly polar bear hunts. The residual would flow from cruise ship visitation, sport fishing, ecotourism, etc.

It is thought that no more than 10 to 20% of the non-hunting tourist expenditures of $4 to $8 million are spent in the seven communities of interest. Pangnirtung would have the largest tourist expenditures of the seven. There are about 10 ecotourism operators and about 19 cruise ship visits annually in the seven communities.

3.0 HARBOUR INVESTMENTS AND IMPACTS

This section outlines the planned harbour investments and harbour investment strategy by DFO Small Craft Harbours. Beneficial impacts on the Nunavut economy from harbour construction and operation also are detailed. Impacts on commercial fishery, tourism and other businesses sectors are addressed in Section 4 to follow.

3.1 General In vestment Approach

The cost of the seven (7) harbour facilities in aggregate is about $34 million (excluding a contingency allowance). Cost details on each harbour are provided in Appendix B and summarized below:

	Harbour Cost $million 2004
Pangnirtung	$7.9
Qikiqtarjuaq	2.0
Clyde River	3.3
Pond Inlet	8.8
Repulse Bay	4.3
Chesterfield Inlet	3.6
Kugaaruk	3.9
	$33.8

Tide and other marine conditions, as well as harbour requirements, vary by community.

The goal is to provide 100% protection of docks and floats under all wave action and wind directions (each harbour has a system of floats). Moreover, small boats would have access to harbour moorage 24 hrs a day. The Baffin Island harbours would be built to accommodate a 65m (210 feet) in length factory trawlers – these harbours will also accommodate large cruise ships, scientific research vessels etc. as well as smaller vessels under 20m (65 feet) in length.

It is premature to identify the exact contracting approach that DFO Small Craft Harbours would take for harbour construction and operation but the following principles are likely:

- have one or two project managers/project management companies that oversee construction of all 7 harbours depending upon the implementation schedule
- build one harbour per year for 7 years or build the seven harbours over 4 years (I the first year, 2 in each of the following three years)
- engineer and build to higher standards to minimize ongoing Operation & Maintenance (O&M) costs including dredging
- use as much local labour, contractors, and machinery & equipment as possible (each community has several machine operators – see Exhibit I, Section I)
- the community would be responsible for ongoing O&M costs and harbour management

Specific details on labour requirements – unskilled semiskilled, skilled – and materials and machinery costs for each proposed facility are given in Appendix B.

Exhibit 4: Economic Impacts of Nunavut Harbour Construction & Operations

	Seven Communities							
	Pang-nirtung	Qikiq-tarjuaq	Clyde River	Pond Inlet	Repulse Bay	Chester-field Inlet	Kugaaruk	All
Construction (one time)								
Direct								
GDP* $000	2,640	570	1,020	2,740	1,340	1,140	1,200	10,650
Labour Income $000	1,680	400	660	1,720	850	720	780	6,810
Employment PYs**	32	8	13	32	16	14	15	130
Total								
GDP* $000	3,560	770	1,380	3,700	1,810	1,540	1,620	14,380
Labour Income $000	2,100	500	830	2,150	1,060	900	970	8,510
Employment PYs**	43	10	17	43	21	19	20	173
O & m (Ongoing)								
Direct								
GDP* $000	80	20	30	90	40	40	40	340
Labour Income $000	80	20	30	90	40	40	40	340
Employment PYs**	1	<1	1	1	1	1	1	6
Total								
GDP* $000	110	40	50	140	60	60	60	520
Labour Income $000	100	30	40	120	50	50	50	440
Employment PYs**	2	1	1	2	1	1	1	9

** Gross Domestic Product*
*** Person-years*

Source: Direct Impacts—Appendix B.
Total Impacts—regional multipliers applied to direct impacts (total impacts include indirect supplier plus induced consumer respending impacts).

3.2 Construction & Operation Phase Impacts

Exhibit 4 provides direct and total economic impacts of harbour construction and operation, by community, for three indicators:

- Gross Domestic Product (GDP) — the combined return to capital and labour in the economy
- Labour Income (LI) — wages, salaries plus benefits i.e., the return to labour and part of GDP
- Employment — measured in person-years (PY) equivalents

Income and employment impacts arise directly from construction and operation activities e.g., wharf construction. In addition, spinoff or "multiplier" impacts occur through backward linkages to suppliers of goods and services (e.g., fuel suppliers) and through the respending of wage incomes earned by workers on consumer goods and services (e.g., retail purchases). The sum of direct harbour, indirect supplier-related, and induced consumer respending impacts is the total impact The impacts for all seven (7) communities in aggregate are:

	Construction (one time)			Operation (annual)		
	GDP*	**LI****	**EM*****	**GDP***	**LI****	**EM*****
Direct	10,650	6,810	130	340	340	6
Indirect & Induced	3,730	1,700	43	I8O	IO0	3
Total	14,380	8,510	173	520	440	9

* *Gross Domestic Product $000*
** Labour *Income $000*
*** *Employment person-years (PYs)*

The bulk of impacts are felt at the direct construction phase. Due to the relatively small size of the population base and economy of Nunavut, many of the required goods and services will be imported from Southern Canada. Such "leakages" reduce the indirect supplier and induced consumer impacts accruing to Nunavut interests. The operation phase impacts of the network of harbours are relatively modest.

4.0 STIMULATED ECONOMIC ACTIVITY AND IMPACTS

This section outlines the increased economic activity and increased impacts/benefits in subsistence harvesting, commercial fishery and tourism sectors.

4.1 Subsistence Benefits

Increased Subsistence Harvests

There would be substantial benefits to the subsistence sector from the planned harbour developments. In some cases, these benefits would not take the form of greater subsistence harvests of animals, but rather increased convenience and safety – the Inuit culture entails "only taking what you need." In other cases, increased access would result in additional harvests as current food needs are not being met (Indian and Northern Affairs Canada).

> *In 1997, approximately 80% of women in Pond Inlet and* Repulse *Bay reported running* out of *money* to *buy food, about half reported not having enough to eat in the house in the past month, and about 40% of women were "extremely concerned" about not having enough money to buy food. This situation was worse for families on social assistance...*

Hunters would have access to their boats and their communities at all tide conditions with improved harbours, and not just at high tide. This in turn would provide greater access to traditional harvesting grounds. Presently subsistence activities and trips are planned around the tides.

For this study, we estimate increased subsistence harvests to be about 10 to 20% of current harvests of marine mammals and fish – this increase amounts to 110 tonnes edible weight for the seven communities in total (see Exhibit 5). Communities with higher tides receive higher relative increases.

This increased harvest is worth an estimated $2.2 million, based on $20 per kg as the replacement cost of food protein in local food stores. The $20 per kg valuation reflects both the higher cost of food in the North and the high protein content of country food. In the smaller northern communities, food costs are twice or more those in Southern Canada. The protein content of country food such as beluga whale and fish is approximately 60% greater than for domestic meats such as beef, pork, and poultry on an equivalent weight basis (see Usher 1976).

Decreased Damage to Boats

There also would be less damage to boats used in subsistence activities, especially aluminium boats. Several boats are overturned and lost each year due to wave and wind action in the seven communities. For example, Pond Inlet subsistence hunters try to move their boats to the Salmon River, a sheltered position, when the wind blows to prevent damage. Exhibit 5 gives an estimate of $300,000 annually in damage cost savings due to the existence of harbour facilities.

Occasionally there is loss of life due to the lack of harbour facilities.

> *. . . two years ago we lost an elder in front of our eyes, an elder who was trying to reach and move his boat when the wind came up from the west (elder at Pond Inlet community meeting, October* 21, *2004).*

Exhibit 5: Economic Activity and Impacts from Nunavut Harbours

	Seven Communities							
	Pang-nirtung	Qikiq-tarjuaq	Clyde River	Pond Inlet	Repulse Bay	Chester-field Inlet	Kugaaruk	All
A. Harvesting Impacts								
Subsistence tonnes	40	10	10	20	10	10	10	110
Fish Catches tonnes								
Char	20	5	5	5	10	10	5	60
Turbot	450	450	450	450	0	0	0	1,800
B. Value Impacts $000								
Subsistence Harvest	800	200	200	400	200	200	200	2,200
Less Boat Damage	75	50	25	75	25	25	25	300
Fish Sales*	2,050	1,200	1,200	1,200	100	100	50	5,900
Tourist $	250	150	100	250	50	50	50	900
Total	3,175	1,600	1,525	1,925	375	375	325	9,300
C. Economic Impacts								
Direct								
GDP* $000	2,010	980	940	1,200	250	250	220	5,850
Wages $000	1,730	820	790	1,000	220	220	200	4,980
Employment PYs**	58	25	24	33	10	10	9	169
Total								
GDP* $000	2,500	1,270	1,220	1,520	290	290	240	7,330
Wages $000	2,010	990	950	1,180	240	240	210	5,820
Employment PYs**	65	29	28	37	10	10	10	189

Source: GSGislason & Associates Ltd. estimates

Notes: 1. Subsistence economic parameters (GSGislason, January 2003).
- *$20 per kg edible weight value for subsistence harvests*
- *GDP and wages are 75% of subsistence values*
- *Subsistence "jobs" derived from 1 PY = $20,000 in wages*

2. Non-subsistence employment figures derived from 1 PY = $40,000 in wages (including benefits)

3. Fish sales of processed char of $540,000 plus 5,360,000 sales of turbot (processed for Pangnirtung, unprocessed for Qikiqtarjuaq, Clyde River and Pond Inlet).

4. Potential economic activity and impacts from additional code storage/fish processing in Nunavut communities (apart from Pangnirtung) are not included. The estimates also do not include any impacts from shrimp fishing.

Harbour facilities would provide increased human safety and reduced deaths and injuries. These safety benefits can not be valued.

Some elders that we interviewed also indicated that a harbour facility would provide increased security, reduced theft and reduced vandalism for boats and motors.

4.2 Commercial Fishing

Several studies have identified commercial fisheries as a major opportunity for community economic development in Nunavut. These studies also have highlighted the critical role of harbour infrastructure in realizing this potential:

The lack of community docks and ports is a severe *impediment to* the *development of small or large scale fisheries in Nunavut (LPS Aviation, 2001).*

Lack of docking facilities means that inshore vessels can not be adequately harboured from the weather and tides experienced in the Arctic (Brubacher, 2004).

Federal investment is needed to produce the major infrastructure required to achieve Ii ft-off in Nunavut's economic growth sectors (Nunavut Economic Development Strategy, 2003).

. . . for Nunavut to capture the broader benefits from commercial fishing, it requires marine infrastructure such as harbour facilities that would enable ships to dock, unload their catch, and receive regular maintenance (Conference Board of Canada, 2004).

Char

The char stocks of Nunavut are underutilized -- the commercial fishery could expand as only about 25% of the present commercial quota is taken.

The seven new harbour facilities would provide impetus to this expansion. As outlined in Exhibit 5, we project a 60 tonne (approximately 100%) increase in char catch attributable to the harbour developments. This would result in an approximate $540,000 increase in fish sales at the wholesale (processed) level.

Turbot

Information on the productivity and sustained yield potential of subdivision OA stocks is imprecise. More science is required. Recent evidence suggests that inshore and offshore OA turbot stocks are distinct and do not commingle. This research result in turn suggests that an additional 400-500 tonnes could be caught in Cumberland Sound close to Pangnirtung.

Our commercial fisheries projections in Exhibit 5 include an increase in turbot catch and processing of 450 tonnes for Pangnirtung. Exhibit 5 also includes a projection of a 450 tonne catch of turbot for each of Qikiqtarjuaq, Clyde River, and Pond Inlet. This is not a prediction but rather a scenario whereby the communities and their turbot quota allocation from the NWMB withdraws from the Baffin Fisheries Coalition and tries to fish the quota themselves. The Qikiqtarjuaq Hunters & Trappers Organization (HTO) has purchased a vessel and is having **it** refitted in Newfoundland for commercial fishing in Northern conditions. The additional fish would be caught by 35 to 65 foot vessels manned by 3 to 6 individuals, with each vessel catching 100 to 200 tonnes of turbot.

The effective price for turbot for the other Baffin communities is less than at Pangnirtung since the fish would be sold unprocessed to Southern Canada or international buyers (the Pangnirtung turbot would be processed at the local plant). However, in the long term additional processing opportunities could exist.

The opportunity also has been identified for Baffin communities, which are close to OA fishing grounds, to harvest turbot and then store the raw fish at local cold storage facilities, to be built by the private sector. The frozen fish then would be shipped to European and Asian markets by sea. Large southern-based fishing trawlers could welcome the opportunity to store their catches at local Baffin ports as this will

decrease their travelling time and increase their fishing time during the short season (Jerry Ward, BFC pers. comm.).

This opportunity has not been incorporated into our projections but it does illustrate the considerable "upside" to community fisheries benefits with harbour development. Additional turbot fishing opportunities to Nunavut could exist as science on stock status and potential improves (i.e., the quota increases) or as the Nunavut share of quota increases – the 1,800 tonne projected catch increase for the local Nunavut fleet is less than 20% of the current 9,500 total quota for Canada.

Shrimp and Other

We do not incorporate any benefits from increased catches of shrimp, clams, scallops or other species at this time. Potential does exist but the potential is much longer term as, for example, no Nunavut catches or processing of shrimp presently occurs. Akin to turbot there are opportunities for shrimp to be stored at local cold storage facilities and then shipped to world markets.

4.3 Tourism

Tourism is a community-based economic activity that would be stimulated by the construction of harbours in the seven communities. All communities would receive benefits but the bulk of benefits are likely to accrue to Baffin Island communities. Pangnirtung and Pond Inlet in particular are very scenic with mountain vistas, icebergs, and other amenities to draw international interests. The other communities do have attractions, mainly historic and cultural, but they do not have the spectacular scenery as do the Baffin communities e.g., Repulse Bay is in close proximity to a stone house built by early explorers.

The $900,000 increase in tourist expenditures over all seven communities, as given in Exhibit 5, represents a doubling of current tourist expenditures in these locations.

Our interviews and research also suggest the following:

- with 24 hour harbour access ecotourism operators could book ½ day tourism trips (this is impossible to do now)
- cruise ships could stay in port longer, lose less time loading and unloading passengers, and make more visits – this would stimulate local spending
- several communities are directly adjacent to national or territorial parks – multi-activity (land and sea) adventure trips could be promoted.
- tourist operators and other clients could take advantage of the 24 hours of daylight during summer.

At the same time, we also heard that severe constraints to tourist business development exist including: I) human resources and training issues, 2) the history and expectation that government will provide all investment capital, and 3) the lack of basic accommodation services with many of the few hotels, bed and breakfasts etc. available preferring to serve construction crews (Blackstone, 2001). Severe impediments to tourist business expansion, besides lack of harbour marine infrastructure, exist.

4.4 Other Economic Sectors

New harbour facilities in Nunavut could also stimulate other economic sectors such as mining exploration and development, film production and construction. Infrastructure is critical to outside developers and investors.

4.5 Economic Impacts

Exhibit 5 provides direct and total economic impacts to Nunavut arising from increased subsistence harvest, decreased boat damage, increased commercial fishing activity and increased tourist visitation and expenditures for each of the seven (7) communities. The impacts over all communities in aggregate are:

Economic Impacts— 7 Communities			
	GDP*	**LI****	**EM*****
Direct	**5,850**	**4,980**	**169**
Indirect & Induced	1,880	840	20
Total	**7,730**	**5,820**	**189**

* *Gross Domestic Product $000*
** *Labour Income $000*
*** *Employment person-years (PYs)*

As with harbour construction and operation, the bulk of impacts are felt at the direct industry stage, rather than the indirect supplier or induced consumer respending stage, due to the substantial leakages from the Nunavut economy.

5.0 COMMUNITY AND SOCIAL BENEFITS

The launch of harbour facilities in the seven (7) communities will fundamentally change the communities and Nunavut. Many of these beneficial effects are intangible.

The jobs and income derived from harbour construction and operations and from on-going economic endeavours will draw some people off social assistance into meaningful employment and help reduce several social problems associated with high unemployment. Meaningful employment will reduce despair, increase hope for the future, and provide role models for youth. These benefits will reduce territorial and government support expenditures and increase individual and community self-reliance.

The harbours will provide a platform for local economic and business development, opportunities that do not require individuals to move from their home community i.e., harbours will facilitate community economic development.

In addition, it is very likely that the harbour will become a focal point for community events and activities e.g., community festivals and celebrations, unorganized leisure activities by local residents and visitors, youngsters fishing from the dock etc. This has happened at DFO Small Craft Harbours in Southern Canada (see GSGislason April 2003 for example).

Other community and social benefits include:

- facilitate intercommunity travel
- help load/unload community supplies
- provide emergency access to/from community
- allow the community to access safely a supply of stone for carving

Finally, a network of federal government harbours in Nunavut can help Canada assert it's sovereignty over the North. Patrol vessels, research vessels and the like need safe harbours from which to operate. With climate change ongoing, there is a need for increased and visible presence in the extreme northern waters of Canada. This would be facilitated with harbour developments in Nunavut.

6.0 CONCLUSIONS

The seven (7) proposed DFO Small Craft Harbours facilities will become a major economic and community force in Nunavut. The harbours serve as a platform that allows and enables a variety of commercial fishing, tourism and other ventures to proceed. The harbours also will stimulate increased subsistence harvests of marine mammals and fish and provide increased convenience and safety to subsistence hunters and fishermen, an important benefit.

Exhibit 6 summarizes the study results.

	Harbour Construction	Annual Harbour O&M plus Economic Activities
GDP $000	14,380	7,850
Wages $000	8,510	6,260
Employment PYs	173	198

Subsistence activities comprise $1.65 million of the total GDP (Gross Domestic Product) and wage impacts and generate 84 person-years of total employment impacts. The greatest “cash economy” impacts flow from commercial fishing opportunities. There is substantial “upside” to the estimates e.g., if new cold storage and processing plants are built.

The overall unemployment rate in the seven communities is 23%. The continuing employment generated by the seven harbours will reduce the unemployment rate by six percentage points to 17%.

The launch of harbour facilities will fundamentally change the seven communities. The harbours will become the focal point of community events, reduce community unemployment and associated social problems, increase community business capacity and self-reliance, facilitate intercommunity travel, and assist in community resupply.

And a network of federal government harbours in Nunavut can help Canada assert its sovereignty over the far north, an especially important consideration given ongoing climate change.

These economic, community, and intrinsic benefits will substantially enhance the quality of life in Nunavut. These new harbours also will increase the federal presence in Nunavut, and assist the federal government in meeting its commitments and responsibilities to Canada’s newest territory.

Exhibit 6: Impact Summary for Nunavut Harbour Developments

Community/Impact Measure		Impact Source: Harbour Construction	Impact Source: Annual Harbour O&M plus Economic Activities
Pangnirtung	- GDP $000	3,560	2,610
	- Wages $000	2,100	2,110
	- Employment PYs	43	67
Qikiqtarjuaq	- GDP $000	770	1,310
	- Wages $000	500	1,020
	- Employment PYs	10	30
Clyde River	- GDP $000	1,380	1,270
	- Wages $000	830	990
	- Employment PYs	17	29
Pond Inlet	- GDP $000	3,700	1,660
	- Wages $000	2,150	1,300
	- Employment PYs	43	39
Repulse Bay	- GDP $000	1,810	350
	- Wages $000	1,060	290
	- Employment PYs	21	11
Chesterfield Inlet	- GDP $000	1,540	350
	- Wages $000	900	290
	- Employment PYs	19	11
Kugaaruk	- GDP $000	1,620	300
	- Wages $000	970	260
	- Employment PYs	20	11
All Seven (7)	**- GDP $000**	14,380	7,850
	- Wages $000	8,510	6,260
	- Employment PYs	173	198

Note: I. Impacts are the sum of direct industry, indirect supplier and induced consumer respending impacts.

2. One time harbour construction impacts flow from the $33.8 million construction costs in total - $7.9 million Pangnirtung, $2.0 million Qikiqtarjuaq, $3.3 million Clyde River, $8.8 million Pond Inlet, $43 million Repulse Bay, $3.6 million Chesterfield Inlet, $3.9 million Kugaaruk.

3. Annual impacts flow from the $1.5 million in annual harbour O&M costs and the $5.6 million in annual increased economic activity ($4.5 million fish sales, $0.9 million tourism, $0.2 million less boat damage).

BIBLIOGRAPHY

Blackstone Corporation Resource Management & Tourism Consultants, “A Strategic Plan for Tourism Development in Nunavut”, 200I.

Blackstone Corporation Resource Management & Tourism Consultants, “The Time is Right: A Vision and Strategy for Tourism Development in Nunavut”, 2001.

Brubacher Development Strategies Inc., “A Strategic Framework for Nunavut Fisheries - Consultation Document”, March 2004.

Brubacher Development Strategies Inc., “An Overview of Nunavut Fisheries - Synthesis Document”, March 2004.

Conference Board of Canada,” Infrastructure Planning for Nunavut’s Communities: Interim Report”, Prepared for Nunavut Association of Municipalities, January 2004.

Consilium Nunavut Inc., “Kitikmeot Foods Limited Marketing Study for a Fish and Meat Processing Facility in Cambridge Bay, Nunavut”, Final Report Prepared for Nunavut Development Corporation, December 2002.

Fisheries & Marine Institute, “Cumberland Sound Resource Assessment and Fisheries Training Project”, March 2003.

GSGislason & Associates Ltd. and Outcrop Ltd., “The Marine-Related Economy of NWT and Nunavut”, Prepared for Canada Fisheries & Oceans, Winnipeg, January 2003.

GSGislason & Associates Ltd., “The SCH Harbours of BC - A Major Economic & Community Asset”, Prepared for Canada Fisheries & Oceans, Vancouver, April 2003.

Indian and Northern Affairs Canada, “Nutrition and Food Security in Kugaaruk, Nunavut - Baseline survey for the Food Mail Pilot Report “Background” [nd.]

Jacques Whitford Environmental Ltd., “Social and Economic Benefits Assessment of Fisheries and Sealing in Nunavut”, Prepared for Department of Sustainable Development Government of Nunavut, August 2002.

Lawn, Judith and Dan Harvey of Dialogos Educational Consultants Inc., “Nutrition and Food Security in Kugaaruk, Nunavut – Baseline survey for the Food Mail Pilot Project”, Prepared for Indian and Northern Affairs Canada [n.d.]

LPS Aviation et al, “Nunavut Transportation Study”, Prepared for Nunavut Community Government & Transportation, 200I.

Nunavut Dept of Sustainable Development, “The Fishing Industry of Nunavut: Sedna’s Bounty, Sprit, Soul and Sustenance”, [nd.]

Nunavut Development Corporation, “Annual Report 2003”.

Nunavut Tourism, “Nunavut Cruise Ship Visits — A Handbook for Your Community” [n.d.]

Priest, Heather and Peter J. Usher, “The Nunavut Wildlife Harvest Study”, August 2004.

RT & Associates, “Meat and Fish Processing in Nunavut: Issues, Factors, and Opportunities for Future Development”, Prepared for Nunavut Development Corporation, September 2001.

Senate of Canada, “Nunavut Fisheries: Quota Allocations and Benefits”, Report of the Standing Committee on Fisheries and Oceans, April 2004,

Sivummut Economic Development Strategy Group, “Nunavut Economic Development Strategy: Building a Foundation for the Future”, June 2003.

Statistics Canada, “Census of Canada 2001”.

Topolniski, D.E., ‘Financial and Economic Analysis of the 1986 – 1990 Exploratory Fisheries for Turbot and Scallops in Cumberland Sound, Baffin Island”, Canada Fisheries & Oceans ECAD Report No. I 35, 1993.

Walsh, Philip of Fisheries & Marine Institute, “Training and Preliminary Resource Assessment of Potential Commercial Turbot Fishing Areas in the Baffin Island Region”, October 2003.

Usher, PeterJ., “Evaluating Country Food in the Northern Native Economy”, Arctic Vol. 29 No.2: 106-120, 1976

Appendix A

List of Interviews

LIST OF INTERVIEWS

A. Economic Development Officers & Officials

David Kattegatsiak	Chesterfield Inlet
Marie Kringut	Repulse Bay
Vincent Ningark	Kugaarulc
Billy Palluq	Clyde River
Morris Kuniliusie	Qikiqtarjuaq
Cohn Saunders	Pond Inlet
Rueben Murphy	Pangnirtung

B. Other

James Williams	Pangnirtung Fisheries Ltd	Pangnirtung
Michael Nowinsky	"	"
Paul Harris	Nunavut Bureau of Statistics	Pangnirtung
Jim Noble	Nunavut Wildlife Board	Iqaluit
Ben Kovac	"	"
Michelle Wheatley	Canada Fisheries & Oceans	Iqaluit
Tania Gordanier	"	"
Derrick Moggy	"	"
Wayne Lynch	Nunavut Dept of Environment	Iqaluit
Larry Simpson	"	"
Sam Nuqingaq	Qikiqtarjuaq HTO	Qikiqtarjuaq
Jerry Ward	Baffin Fisheries Coalition	Iqaluit & St. Johns
Carey Bonnell	Ex-Nunavut Dept of Environment	St. John's
Glen Blackwood	Centre for Sustainable Aquatic Resources	St. John's
Alastair O'Rielly	Canadian Centre for Fisheries Innovation	St. John's
Rosemary Keenainak	Nunavut Economic Development	Iqaluit
Sakiase Sowdlooapik	Nunavut Dept of Environment	Pangnirtung
Russell Brandon	Nunavut Wildlife Officer	Qikiqtarjuaq
Maureen Bundgaard	Nunavut Tourism	Iqaluit
Alan Johnson	Nunavut Transportation	RankinInlet

C. Community Meetings Attended

Fisheries Strategy Consultation	~ 30 attendees	Iqaluit
Community Harbour Development	~ I5 attendees	Pangnirtung
Community Harbour Development	~ 30 attendees	Pond Inlet

Appendix B

Nunavut Harbour Costs

Exhibit B.1: Costs of Nunavut Harbour — Pangnirtung

1. Construction Costs of Harbour $000 2004

	Total Const^{n} Cost	Nunavut Wages							
		Unskilled	Semi-skilled	Skilled	Total	Other Labour	Materials	Machinery	Other
Breakwater & Marshalling	**1,075**	**54**	**105**	**0**	**159**	**0**	**323**	**421**	**0**
Dredging	3,925	196	530	0	726	0	196	3,003	0
Wharf	1,000	200	37	0	237	0	550	213	0
Floats	570	228	9	0	237	0	285	48	0
Eng&Design	657	0	0	0	0	657	0	0	0
Project Mgt Fees	657	0	0	322	322	138	0	0	197
TOTAL	7,884	678	681	322	1,681	795	1,354	3,857	197

2. Operation Costs of Harbour $000 2004

Annual O&M Costs	Nunavut Wages			Other
	Unskilled	Semiskilled	TOTAL	
355	4	63	77	278

3. Nunavut Employment — person-years

Construction (lump sum)	31.5
O&M (annual)	1.0

I. Construction costs and assumptions provided by DFO:

- *Breakwater & marshalling costs split 30% materials, 65% equipment (15% semiskilled labour; 85% machinery), 5% unskilled labour.*
- *Dredging costs split: 5% materials, 90% equipment (15% semiskilled labour, 85% machinery), 5% unskilled labour.*
- *Wharf costs split 55% materials, 25% equipment (15% semiskilled labour, 85% machinery), 20% unskilled labour.*
- *Floats costs split 50% materials, 10% equipment (15% semiskilled labour, 85% machinery), 40% unskilled labour.*
- *Engineering & design costs: 10% of breakwater, dredging wharf & floats costs (split 0% Nunavut 100% other).*
- *Project management fees: 10% of breakwater; dredging wharf & foot costs (split 49% Nunavut skilled labour, 21% non-Nunavut skilled labour, 30% other).*

2. O&M costs and assumptions provided by DFO:

- *Annual average maintenance casts of 4.4% of breakwater, dredging, wharf and floats costs (5% Nunavut unskilled labour, 10% Nunavut semiskilled labour and 85% other).*
- *Annual average operation costs of 1% of breakwater; dredging wharf and float costs (50% Nunavut semi-skilled labour, 50% other).*

3. Annual wages per Nunavut person-year employment (with payroll burden of 40%):

- *Unskilled - $40,000 (general labour).*
- *Semiskilled - $60,000 (equipment operators).*
- *Skilled - $100,000 (engineer; technician, experienced foreman).*

Exhibit B.2: Costs of Nunavut Harbour — Qikiqtarjuaq

1. Construction Costs of Harbour $000 2004

	Total Const[n] Cost	Nunavut Wages							
		Unskilled	Semi-skilled	Skilled	Total	Other Labour	Materials	Machinery	Other
Breakwater & Marshalling	1,100	55	107	0	162	0	330	608	0
Dredging	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Wharf	**350**	**70**	**13**	**0**	**83**	**0**	**193**	**74**	**0**
Floats	**180**	**72**	**3**	**0**	**75**	**0**	**90**	**15**	**0**
Eng&Design	**163**	**0**	**0**	**0**	**0**	**163**	**0**	**0**	**0**
Project Mgt Fees	**163**	**0**	**0**	**80**	**80**	**34**	**0**	**0**	**49**
TOTAL	**1,956**	**197**	**123**	**80**	**400**	**197**	**613**	**697**	**49**

2. Operation Costs of Harbour $000 2004

Annual O&M Costs	Nunavut Wages			Other
	Unskilled	Semiskilled	TOTAL	
88	4	15	19	69

3. Nunavut Employment — person-years

Construction (lump sum)	8.0
O&M (annual)	<0.5

I. Construction costs and assumptions provided by DFO:

- *Breakwater & marshalling costs split 30% materials, 65% equipment (15% semiskilled labour; 85% machinery), 5% unskilled labour.*
- *Dredging costs split: 5% materials, 90% equipment (15% semiskilled labour, 85% machinery), 5% unskilled labour.*
- *Wharf costs split 55% materials, 25% equipment (15% semiskilled labour, 85% machinery), 20% unskilled labour.*
- *Floats costs split 50% materials, 10% equipment (15% semiskilled labour, 85% machinery), 40% unskilled labour.*
- *Engineering & design costs: 10% of breakwater, dredging wharf & floats costs (split 0% Nunavut 100% other).*
- *Project management fees: 10% of breakwater; dredging wharf & foot costs (split 49% Nunavut skilled labour, 21% non-Nunavut skilled labour, 30% other).*

2. O&M costs and assumptions provided by DFO:

- *Annual average maintenance casts of 4.4% of breakwater, dredging, wharf and floats costs (5% Nunavut unskilled labour, 10% Nunavut semiskilled labour and 85% other).*
- *Annual average operation costs of 1% of breakwater; dredging wharf and float costs (50% Nunavut semi-skilled labour, 50% other).*

3. Annual wages per Nunavut person-year employment (with payroll burden of 40%):

- *Unskilled - $40,000 (general labour).*
- *Semiskilled - $60,000 (equipment operators).*
- *Skilled - $100,000 (engineer; technician, experienced foreman).*

Exhibit B.3: Costs of Nunavut Harbour — Clyde River

1. Construction Costs of Harbour $000 2004

	Total Const^{n} Cost	Nunavut Wages				Other Labour	Materials	Machinery	Other
		Unskilled	Semi-skilled	Skilled	Total				
Breakwater & Marshalling	**1,600**	**80**	**156**	**0**	**236**	**0**	**480**	**884**	**0**
Dredging	**570**	**29**	**77**	**0**	**106**	**0**	**28**	**436**	**0**
Wharf	**400**	**80**	**15**	**0**	**95**	**0**	**220**	**85**	**0**
Floats	**200**	**80**	**3**	**0**	**83**	**0**	**100**	**17**	**0**
Eng&Design	**277**	**0**	**0**	**0**	**0**	**277**	**0**	**0**	**0**
Project Mgt Fees	**277**	**0**	**0**	**136**	**136**	**58**	**0**	**0**	**83**
TOTAL	**3,324**	**269**	**251**	**136**	**656**	**335**	**828**	**1,422**	**83**

2. Operation Costs of Harbour $000 2004

Annual O&M Costs	Nunavut Wages			Other
	Unskilled	Semiskilled	TOTAL	
150	6	26	32	118

3. Nunavut Employment — person-years

Construction (lump sum)	12.5
O&M (annual)	0.5

I. Construction costs and assumptions provided by DFO:

- *Breakwater & marshalling costs split 30% materials, 65% equipment (15% semiskilled labour; 85% machinery), 5% unskilled labour.*
- *Dredging costs split: 5% materials, 90% equipment (15% semiskilled labour, 85% machinery), 5% unskilled labour.*
- *Wharf costs split 55% materials, 25% equipment (15% semiskilled labour, 85% machinery), 20% unskilled labour.*
- *Floats costs split 50% materials, 10% equipment (15% semiskilled labour, 85% machinery), 40% unskilled labour.*
- *Engineering & design costs: 10% of breakwater, dredging wharf & floats costs (split 0% Nunavut 100% other).*
- *Project management fees: 10% of breakwater; dredging wharf & foot costs (split 49% Nunavut skilled labour, 21% non-Nunavut skilled labour, 30% other).*

2. O&M costs and assumptions provided by DFO:

- *Annual average maintenance casts of 4.4% of breakwater, dredging, wharf and floats costs (5% Nunavut unskilled labour, 10% Nunavut semiskilled labour and 85% other).*
- *Annual average operation costs of 1% of breakwater; dredging wharf and float costs (50% Nunavut semi-skilled labour, 50% other).*

3. Annual wages per Nunavut person-year employment (with payroll burden of 40%):

- *Unskilled - $40,000 (general labour).*
- *Semiskilled - $60,000 (equipment operators).*
- *Skilled - $100,000 (engineer; technician, experienced foreman).*

Exhibit B.4: Costs of Nunavut Harbour — Pond Inlet

1. Construction Costs of Harbour $000 2004

	Total Const^{n} Cost	Nunavut Wages				Other Labour	Materials	Machinery	Other
		Unskilled	Semi-skilled	Skilled	Total				
Breakwater & Marshalling	3,650	183	356	0	539	0	1,095	2,016	0
Dredging	2,400	120	324	0	444	0	120	1,836	0
Wharf	800	160	30	0	190	0	440	170	0
Floats	450	180	7	0	187	0	225	38	0
Eng&Design	730	0	0	0	0	730	0	0	0
Project Mgt Fees	730	0	0	358	358	153	0	0	219
TOTAL	8,760	643	717	358	1,718	883	1,880	4,060	219

2. Operation Costs of Harbour $000 2004

Annual O&M Costs	Nunavut Wages			Other
	Unskilled	Semiskilled	TOTAL	
394	16	69	85	309

3. Nunavut Employment

	person-years
Construction (lump sum)	31.5
O&M (annual)	1.0

I. Construction costs and assumptions provided by DFO:

- *Breakwater & marshalling costs split 30% materials, 65% equipment (15% semiskilled labour; 85% machinery), 5% unskilled labour.*
- *Dredging costs split: 5% materials, 90% equipment (15% semiskilled labour, 85% machinery), 5% unskilled labour.*
- *Wharf costs split 55% materials, 25% equipment (15% semiskilled labour, 85% machinery), 20% unskilled labour.*
- *Floats costs split 50% materials, 10% equipment (15% semiskilled labour, 85% machinery), 40% unskilled labour.*
- *Engineering & design costs: 10% of breakwater, dredging wharf & floats costs (split 0% Nunavut 100% other).*
- *Project management fees: 10% of breakwater; dredging wharf & float costs (split 49% Nunavut skilled labour, 21% non-Nunavut skilled labour, 30% other).*

2. O&M costs and assumptions provided by DFO:

- *Annual average maintenance casts of 4.4% of breakwater, dredging, wharf and floats costs (5% Nunavut unskilled labour, 10% Nunavut semiskilled labour and 85% other).*
- *Annual average operation costs of 1% of breakwater; dredging wharf and float costs (50% Nunavut semi-skilled labour, 50% other).*

3. Annual wages per Nunavut person-year employment (with payroll burden of 40%):

- *Unskilled - $40,000 (general labour).*
- *Semiskilled - $60,000 (equipment operators).*
- *Skilled - $100,000 (engineer; technician, experienced foreman).*

Exhibit B.5: Costs of Nunavut Harbour — Repulse Bay

1. Construction Costs of Harbour $000 2004

	Total Const^{n} Cost	Nunavut Wages				Other Labour	Materials	Machinery	Other
		Unskilled	Semi-skilled	Skilled	Total				
Breakwater & Marshalling	1,650	83	161	0	244	0	495	911	0
Dredging	1,200	60	162	0	222	0	60	918	0
Wharf	580	116	22	0	138	0	319	123	0
Floats	170	68	2	0	70	0	85	15	0
Eng&Design	360	0	0	0	0	360	0	0	0
Project Mgt Fees	360	0	0	176	176	76	0	0	108
TOTAL	4,320	327	347	176	850	436	959	1,967	108

2. Operation Costs of Harbour $000 2004

Annual O&M Costs	Nunavut Wages			Other
	Unskilled	Semiskilled	TOTAL	
194	8	34	42	152

3. Nunavut Employment

	person-years
Construction (lump sum)	31.5
O&M (annual)	1.0

I. Construction costs and assumptions provided by DFO:

- *Breakwater & marshalling costs split 30% materials, 65% equipment (15% semiskilled labour; 85% machinery), 5% unskilled labour.*
- *Dredging costs split: 5% materials, 90% equipment (15% semiskilled labour, 85% machinery), 5% unskilled labour.*
- *Wharf costs split 55% materials, 25% equipment (15% semiskilled labour, 85% machinery), 20% unskilled labour.*
- *Floats costs split 50% materials, 10% equipment (15% semiskilled labour, 85% machinery), 40% unskilled labour.*
- *Engineering & design costs: 10% of breakwater, dredging wharf & floats costs (split 0% Nunavut 100% other).*
- *Project management fees: 10% of breakwater; dredging wharf & float costs (split 49% Nunavut skilled labour, 21% non-Nunavut skilled labour, 30% other).*

2. O&M costs and assumptions provided by DFO:

- *Annual average maintenance casts of 4.4% of breakwater, dredging, wharf and floats costs (5% Nunavut unskilled labour, 10% Nunavut semiskilled labour and 85% other).*
- *Annual average operation costs of 1% of breakwater; dredging wharf and float costs (50% Nunavut semi-skilled labour, 50% other).*

3. Annual wages per Nunavut person-year employment (with payroll burden of 40%):

- *Unskilled - $40,000 (general labour).*
- *Semiskilled - $60,000 (equipment operators).*
- *Skilled - $100,000 (engineer; technician, experienced foreman).*

Exhibit B.6: Costs of Nunavut Harbour — Chesterfield Inlet

1. Construction Costs of Harbour $000 2004

	Total Const^{n} Cost	Nunavut Wages				Other Labour	Materials	Machinery	Other
		Unskilled	Semi-skilled	Skilled	Total				
Breakwater & Marshalling	1,250	63	122	0	185	0	375	690	0
Dredging	1,170	58	158	0	216	0	59	895	0
Wharf	350	70	13	0	83	0	192	75	0
Floats	210	84	3	0	87	0	105	18	0
Eng&Design	298	0	0	0	0	298	0	0	0
Project Mgt Fees	298	0	0	146	146	63	0	0	89
TOTAL	3,576	275	296	146	717	361	731	1,678	89

2. Operation Costs of Harbour $000 2004

Annual O&M Costs	Nunavut Wages			Other
	Unskilled	Semiskilled	TOTAL	
161	7	28	36	125

3. Nunavut Employment

	person-years
Construction (lump sum)	13.5
O&M (annual)	0.5

I. Construction costs and assumptions provided by DFO:

- *Breakwater & marshalling costs split 30% materials, 65% equipment (15% semiskilled labour; 85% machinery), 5% unskilled labour.*
- *Dredging costs split: 5% materials, 90% equipment (15% semiskilled labour, 85% machinery), 5% unskilled labour.*
- *Wharf costs split 55% materials, 25% equipment (15% semiskilled labour, 85% machinery), 20% unskilled labour.*
- *Floats costs split 50% materials, 10% equipment (15% semiskilled labour, 85% machinery), 40% unskilled labour.*
- *Engineering & design costs: 10% of breakwater, dredging wharf & floats costs (split 0% Nunavut 100% other).*
- *Project management fees: 10% of breakwater; dredging wharf & float costs (split 49% Nunavut skilled labour, 21% non-Nunavut skilled labour, 30% other).*

2. O&M costs and assumptions provided by DFO:

- *Annual average maintenance casts of 4.4% of breakwater, dredging, wharf and floats costs (5% Nunavut unskilled labour, 10% Nunavut semiskilled labour and 85% other).*
- *Annual average operation costs of 1% of breakwater; dredging wharf and float costs (50% Nunavut semi-skilled labour, 50% other).*

3. Annual wages per Nunavut person-year employment (with payroll burden of 40%):

- *Unskilled - $40,000 (general labour).*
- *Semiskilled - $60,000 (equipment operators).*
- *Skilled - $100,000 (engineer; technician, experienced foreman).*

Exhibit B.7: Costs of Nunavut Harbour — Kugaaruk

1. Construction Costs of Harbour $000 2004

	Total Const^{n} Cost	Nunavut Wages				Other Labour	Materials	Machinery	Other
		Unskilled	Semi-skilled	Skilled	Total				
Breakwater & Marshalling	1,850	92	181	0	273	0	555	1,022	0
Dredging	755	38	102	0	140	0	38	577	0
Wharf	350	70	13	0	83	0	193	74	0
Floats	290	116	4	0	120	0	145	25	0
Eng&Design	325	0	0	0	0	325	0	0	0
Project Mgt Fees	324	0	0	159		68	0	0	97
TOTAL	3,894	316	300	159	775	393	931	1,698	97

2. Operation Costs of Harbour $000 2004

Annual O&M Costs	Nunavut Wages			Other
	Unskilled	Semiskilled	TOTAL	
175	7	31	38	137

3. Nunavut Employment

	person-years
Construction (lump sum)	14.5
O&M (annual)	0.5

I. Construction costs and assumptions provided by DFO:

- *Breakwater & marshalling costs split 30% materials, 65% equipment (15% semiskilled labour; 85% machinery), 5% unskilled labour.*
- *Dredging costs split: 5% materials, 90% equipment (15% semiskilled labour, 85% machinery), 5% unskilled labour.*
- *Wharf costs split 55% materials, 25% equipment (15% semiskilled labour, 85% machinery), 20% unskilled labour.*
- *Floats costs split 50% materials, 10% equipment (15% semiskilled labour, 85% machinery), 40% unskilled labour.*
- *Engineering & design costs: 10% of breakwater, dredging wharf & floats costs (split 0% Nunavut 100% other).*
- *Project management fees: 10% of breakwater; dredging wharf & float costs (split 49% Nunavut skilled labour, 21% non-Nunavut skilled labour, 30% other).*

2. O&M costs and assumptions provided by DFO:

- *Annual average maintenance casts of 4.4% of breakwater, dredging, wharf and floats costs (5% Nunavut unskilled labour, 10% Nunavut semiskilled labour and 85% other).*
- *Annual average operation costs of 1% of breakwater; dredging wharf and float costs (50% Nunavut semi-skilled labour, 50% other).*

3. Annual wages per Nunavut person-year employment (with payroll burden of 40%):

- *Unskilled - $40,000 (general labour).*
- *Semiskilled - $60,000 (equipment operators).*
- *Skilled - $100,000 (engineer; technician, experienced foreman).*

Appendix C

Funding Opportunties Assessment Report – Nunavut Harbours

Funding Opportunities Assessment Report — Nunavut Harbours
May 27, 2005

Fisheries and Oceans Canada (DFO)

Small Craft Harbours — Financial Overview

Mandate
While the Legal mandate provides SCH with a wide authority to construct, operate, repair and acquire harbours and harbour facilities (Fishing and Recreational Harbours Act), Program Review decisions and overall financial constraints have effectively forced SCH to place a more narrow focus towards existing harbours designated as being central to the fishing industry.

Overall Pressures
SCH has faced increasing financial pressures and constraints over the last few years and is presently contemplating various options to address these shortfalls in the future. Questions concerning the SCH financial situation have been explored over the last few years by means of various studies and analyses. These exercises have pointed out a few systemic issues, including:

- A lack of adequate and stable maintenance funding for core fishing harbours;
- No funding available to complete harbour disposals under the current divestiture strategy;
- No contingency funding in case of major storms;
- An annual revenue shortfall caused by Program Review decision to increase revenue targets while at the same time divesting recreational harbours (the usual source of revenue);

Funding Mechanism Constraints
Assuming the use of existing program resources towards the construction of fishing harbour infrastructure in Nunavut, the magnitude of required funds precludes SCH from using Departmental Class Contributions as a tool (departmental limit is $4 million annually). Therefore, a new authority would be required if contributions were selected as the preferred funding instrument. Assuming that this authority was obtained, a source of funds issue would still exist as, under this scenario, it would still be necessary to convert operating funds into contribution funds. Needless to say, operating fund levels are already insufficient to meet current program requirements.

To summarize, financial flexibility to increase program activities is non existent in SCH, unless a significant number of other projects and/or regular maintenance activities are delayed and/or cancelled. Given that present financial levels are largely insufficient for current needs, adding activities to an already unsustainable program is not feasible without either adding resources or further reducing other activities of the program.

Funding from Other Sectors
The department as a whole has been experiencing significant financial constraints for some time. Several unfunded priorities in the 2004-05 budget allocations were funded using special measures such as internal reallocations and expenditure restrain measures and it appears that the 2005-06 allocations will follow the same pattern. It does not look like other sectors have the financial flexibility to contribute towards an expensive initiative like building harbours in Nunavut.

Future Year Budget Allocations

One funding possibility is to include the Nunavut project as an unfunded priority in the department's budget allocations. However, a drawback to this solution is that it does not truly address the problem from a departmental perspective since it ultimately consists of a resource reallocation from other sectors without addressing the need for additional resources. Many sectors already have unfunded priorities of their own and would likely protest being required to fund another sector's priority while failing to address their own. This would also run counter to the "managing within resources" management philosophy encouraged by the DAAP review and is not likely to be supported.

Departmental Expenditure Review

During the fall of 2004 Expenditure Review, which was initiated Government-wide, DFO identified proposals for expenditure reductions equal to 5% of its current budget, an amount equivalent to approximately $57 million. This has added to the growing list of pressures currently facing the department.

Possibility of TB Special Funding

Should DFO seek funding from Treasury Board, the department may be required to establish partnerships with other government departments or to contribute some funds from within the department. An MC would likely be required beforehand (please see more on this in the INAC portion of the report under the Northern Strategy).

Possibility of Memorandum to Cabinet

Any proposal submitted to Cabinet should ensure to clearly outline any linkages with the overall Federal Northern Strategy being developed now. The feasibility of preparing such a document depends on the priority that is given to this program by senior management and other decision makers. Linkages should clearly be directed to development in the renewable resources sectors, such as Commercial Fisheries in Nunavut (please see the NAG portion of this report).

Conclusion

As a result of the DAAP and the recent expenditure review, the financial context in DFO is one of restraint and of thorough and painstaking financial management. Recent cost-saving exercises have resulted in various restrain measures that have not left many stones unturned in the quest for savings. As a result, SCH and the department as a whole do not appear to have funds available for large, capital intensive projects such as harbours in Nunavut. It would be very difficult to fund this project without some form of external support, whether from another Department or from Cabinet, without compromising sustainability of other DFO programs.

Indian and Northern Affairs Canada (INAC)

Mandate[1]
INAC is responsible for two separate mandates: **Indian and Inuit Affairs** and **Northern Affairs**. This broad mandate is derived largely from the Department of Indian Affairs and Northern Development Act, the Indian Act, and the Constitution Act, 1867; however, the department is responsible for administering over 50 statutes in total.

In *Northern Affairs,* INAC is responsible for meeting the federal government's constitutional, political and legal responsibilities in the North. INAC's role in the North includes settling and implementing land claims, negotiating self-government agreements, advancing political evolution, managing natural resources, protecting the environment and fostering leadership in sustainable development both domestically and among circumpolar nations.

Northern Affairs Program (NAP)
Through the DIAND Act, the Minister of DIAND is the lead federal minister in the North. The Minister's responsibilities are delivered primarily through the programs and services offered by the Northern Affairs Program which fall into two key areas;

- Supporting northern political and economic development through the management of federal interests;

- Promoting sustainable development of the North's natural resources and northern communities.

NAP has the lead responsibility[2] in areas related to the North (which could include the establishment of harbours) since their role includes (but is not limited to):

- Developing policies and legislation related to the management of the North's land, water and mineral resources (Ottawa);

- The operational side of resource management, including issuance of rights and interests, conducting resource assessments and scientific fieldwork, conducting inspections and enforcement activities, conducting environment assessments and environmental monitoring and issuing regulatory approvals (regional offices)

While NAP does manage a myriad of programs related to Northern development, these programs do not directly relate to the responsibility of establishing fishing infrastructure in the North.

Northern Economic Development: Until 2004, INAC's programming in this area was limited to an Innovation and Knowledge fund of about $350,000 per year in each territory, and delivery of the Canada Infrastructure Program - municipal component (for more information on the Canada Infrastructure Program, please see the section below relating to Infrastructure Canada). The objectives of the Innovation and Knowledge fund include expanding knowledge and understanding of northern economic issues and activities, facilitating innovative approaches to development of the North, facilitating northerners seizing opportunities in the new economy, increasing skills to engage in the economy through knowledge and innovation, etc. These

[1] http://www.ainc-inac.gc.ca/ai/1#1
[2] http://www.ainc-inac.gc.ca/ps/nap/intro_e.html

objectives evidently do not fall into the Northern Harbours program discussed in this report.

In budget 2004[3], an announcement of $90 million over five years was made to support strategic investments in northern economic development, with up to $10 million being available in 2004-05. An MC was presented to Cabinet in spring of 2005 proposing ways to invest the remaining Northern Economic Development funding.

2004-05 Funding: The funding allocation for 2004-05 was based on a short list of projects very familiar to INAC officials due to extensive consultations in the recent past. Budgets for that year were split evenly between the three territories ($3.16M each) with a small deduction for administrative fees[4]. While not all funds have been allocated, it is unlikely that a significant portion will be left over for Northern Infrastructure.

Funding for 2005-06 and Ongoing: This portion of the funding represents $80M over 4 years for all territories, with a deduction of approximately 5-10% for an INAC administration fee (please see "Funding Distribution" table below). The funding allocation for future years is currently being established and will be consistent with an overall long term economic strategy for the North.

Funding Distribution — Northern Economic Development (Anticipated Nunavut Portion)

Year	Amount	Type	Use
2004-05	$3.166M	Grants and Contributions	Project list mostly approved
2005-06	$6M	Grants and Contributions	Undetermined
2006-07	$6M	Grants and Contributions	Undetermined
2007-08	$6M	Grants and Contributions	Undetermined
2008-09	$6M	Grants and Contributions	Undetermined
Total	**$27.166M***		

* Amounts are approximate. All territories are expected to receive this amount. Type of funding (G&C) may change depending on results from the discussion paper and depending on approved projects. Additional funding may be forthcoming once an overall Northern Strategy is developed. Funding amount may change based on determination of INAC administration fee.

While INAC is the lead department related to Aboriginal Affairs and Northern Development, they acknowledge that other federal departments have expertise that is required in the successful implementation of a Northern strategy to develop emerging industries. INAC has indicated that many can be called upon to participate in the service delivery related to this budget announcement, although they have also indicated that any joint programming would be considered in a context that would ensure that INAC programming was not constrained by lack of availability of partner resources. Unfortunately, indications thus far have been that while there is recognition that infrastructure is a vital part of an emerging commercial fisheries industry, overall requirements and limited funding for each territory do not allow for expensive investments in infrastructure.

[3] http://www.ainc-inac.gc.ca/nr/prs/j-a2004/2-02481_e.html

[4] A listing of the selected projects for all territories is available.

The Northern Strategy: Besides Northern Economic Development, INAC is working on an overall Northern Strategy which would apply across the Federal government with the objective of defining objectives for the North and mapping out ways in which to meet these objectives (a separate MC is currently being drafted towards these ends). The two following long term goals are expected to be included in the strategy and are consistent with impacts related to harbour infrastructure development in the North:

- Establishing Strong Foundations for Economic Development: As economic diversification is a major contributing factor to a strong economy, strengthening the fishery has been identified by Nunavut and by INAC as a major priority in bringing Nunavut's economy to the next level. While this does imply that fishing harbour infrastructure is crucial in the development of a commercial fishery, attention also has to be placed on fishing quotas, the capacity to harvest the stock, capacity to process the stock and capacity to bring the product to market.

- Building Healthy and Safe Communities: Although harbour infrastructure has not always been mentioned in the context of safer communities, lack of basic harbour infrastructure has an impact on the safety of communities in the North, as mentioned in the Safe Harbours — Healthy Communities paper from the Government of Nunavut (please see below for more information on this document).

INAC is currently consulting with territories and stakeholders with the intent of drafting an MC towards this overall Northern Strategy by summer 2005. While the strategy itself will not likely seek funding for high cost investments such as harbour infrastructure, it would provide a framework under which OFO itself could seek cabinet support for this initiative. DFO could thus contribute to the Northern Strategy by filling gaps that have been acknowledged by INAC but which nevertheless remain unresolved (such as harbour infrastructure in the North).

Territorial Economic Development Plans: As political consultations form an important part of the process of allocating funds, it is worthwhile to examine the message being conveyed by Nunavut officials to various parties related to their most urgent priorities. Ideally, this message should be consistent with the needs being expressed to DFO by Nunavut.

For Nunavut, various documents explore territorial economic needs and objectives, such as the "Nunavut Economic Development Strategy" (provided to INAC), "Safe Harbours – Healthy Communities" (provided to DFO) and "A Strategic Framework for Nunavut Fisheries" (provided to DFO).

- *Nunavut Economic Development Strategy, Government of Nunavut & NTI* (June 2003): This document represents a recent strategic economic vision geared towards identifying key principles, partners, challenges and strategic priorities that must be addressed for the development of the territory's economy. While this document is a key building block in for Nunavut's economic development and makes innumerable recommendations (including many references to establishing a strong commercial fishery in Nunavut), it is intended to be very general in nature and identifies infrastructure in general as a priority for the territory.

- *Safe Harbours — Healthy Communities, Government of Nunavut:* This document presents a vision for Small Craft Harbours in Nunavut and a plan of action to achieve it. It represents a stepping stone towards improving the Nunavut Transportation System and is very specific in the harbour needs for various communities. This report was provided to INAC by DFO for information purposes.

- *A Strategic Framework for Nunavut Fisheries* (March 2004): This document was commissioned to prepare a strategic "framework document highlighting key issues that need to be addressed and recommendations to resolve these developmental issues". Some recommendations relating to infrastructure specifically point out DFO and SCH (for instance recommendation 26 suggests that existing federal resources such as those of DFO's Small Craft Harbours should be applied to meeting marine infrastructure needs in Nunavut).

- *Nunavut Fisheries Strategy, Government of Nunavut & NTI* (March 2005): This strategy calls for federal investment in fundamental economic infrastructure, including harbour and port facilities, marine service centers, processing plants and cold storage facilities. DFO is mentioned in the strategy and the above document *"Safe Harbours — Healthy Communities"* is referenced as well. According to this strategy, marine infrastructure development is the key to realising the potential of the fishery.

While there are possibilities for collaboration and synergistic benefits between INAC and SCH, it appears that DFO may be required to go to Cabinet on it's own under the overall Northern Strategy umbrella, with support from other departments. It is noteworthy to consider that INAC does manage the Infrastructure Canada (Municipal component) program for the territories and there may be possibilities to cooperate with Infrastructure Canada and INAC in the future. However, community consultations towards the prioritisation of municipal projects would have to show that communities favour harbour infrastructure over other basic infrastructure (such as housing).

Other INAC Programs

To give an idea of the scope of responsibilities of INAC in the North, here is a sample of programs available to the territories.

Northern Political Development: Provides research, advice, policy and legislative support for public governance, and northern political development.

Northern Science and Technology: This service includes the delivery of the Northern Scientific Training Program (NSTP) which provides support to Canadian University students for the field portion of research conducted in Canada's north; the Northern Science Award which recognizes a lifetime of excellence and achievement in scientific research in Canada's north by an individual or a group of indigenous people; and the provision of federal coordination with respect to Northern Science and Technology in Canada: Framework and Research Plan, and procedures and options for joint studies and initiatives in Canada's north.

Northern Contaminants Program: The objective of this program is to reduce and, wherever possible, eliminate contaminants in traditionally harvested foods, while providing information that assists informed decision making by individuals and communities in their food use.

Circumpolar Liaison Directorate: The Circumpolar Liaison Directorate is charged with managing the international dimension of INAC's northern mandate.

Food Mail Program: This program carries out the management of providing nutritious perishable food products and other essential items to isolated northern communities at reduced postal rates.

Oil and Gas Management: The management of oil and gas resources North of 60~ latitude in the Northwest Territories, Nunavut and northern offshore is a federal responsibility. This responsibility is carried out by the Northern Oil and Gas Directorate of the Department of Indian Affairs and Northern Development.

Northern Contaminated Sites Program: As the custodian of most federal lands in the North, the Department has responsibility, through the Northern Contaminated Sites Program (CSP), to manage a number of contaminated properties that are no longer maintained by the original occupant (including sites impacted by private sector mining and oil and gas activities and government military activity dating back over half a century).

Land and Water: INAC has responsibility for administering Crown land and water resources in the North. It does this through the development and implementation of policies, legislation, regulations and programs offered primarily in through INAC's regional offices in NWT and Nunavut.

Mines and Minerals: The Mineral Resources Directorate develops policies and legislation to promote the Sustainable Development of mineral resources in the Northwest Territories and Nunavut.

Geoscience: This group monitors and collects data on mining and mineral exploration in Northern Canada and promotes mining investment and provides information and technical advice to a wide variety of clients, including the mining industry, other government departments, First Nations, schools and the general public. Geoscience information is used in mineral exploration, mineral resource and environmental assessment, and land use planning.

INAC has many other programs that are not necessarily applicable to the initiative being discussed in this report. For a full description of these programs, please refer to the INAC website at: http://www.ainc-inac.gc.ca/pr/pub/ywtk/sgp_e.html

Infrastructure Canada

Infrastructure Canada's aim is to overcome the challenges of infrastructure renewal in a manner consistent with environmental, economic and social objectives. Federal infrastructure programs are meant to promote strong and healthy communities by ensuring that infrastructure reflects the priorities of communities across the country. As such, Infrastructure Canada provides strategic investment in communities across the country.

Over the last decade, the Government of Canada has committed close to $12-billion for infrastructure renewal across the country. These investments, when added to the commitment from various partners, have leveraged $30-billion in total investments. Infrastructure Canada has four key programs that contribute towards sustainable development:

- Canada Strategic Infrastructure Fund (SIF);
- Infrastructure Canada Program (ICP);
- The Municipal-Rural Infrastructure Fund (MRIF); and
- The Border Infrastructure Fund (B IF).

Under these four programs, the Government of Canada, in partnership with provinces, territories and municipalities continues to make strategic investments in infrastructure developments.

Strategic Investment Fund (SIF)
The purpose of the SIF is to direct funds towards projects of major federal and regional significance in areas that are vital to sustaining economic growth and enhancing the quality of life to Canadians. To date, the value of the fund is $4 billion, with $2 billion having been announced in the 2001 Federal budget and the remainder having been announced in the 2003 Federal Budget. Nunavut was allocated $20 million for each of the two rounds of funding, bringing the total of SIF contributions to Nunavut to $40 million. Those funds were used towards water/wastewater and housing projects.

Current Status of SIF
Two rounds of funding were announced for this fund —$2 billion in the 2001 Budget and another $2 billion in the 2003 budget. All funds of these funds have presently been notionally allocated to provinces and territories, of which $40 million was allocated to Nunavut. No additional funds under the SIF will be available to Nunavut unless new rounds of funding are announced in future budgets. While decisions to allocate future rounds of funding would be made in the Federal Budget, indications are that the SIF program has been successful in the past. Future rounds of funding are therefore a distinct possibility. Another positive indicator includes "The New Deal for Communities" outlined in the Speech from the Throne, a new deal that targets the infrastructure needed to support quality of life and sustainable growth to build a stronger economy and better communities for all regions of the country. However, funding awarded under this initiative could be allocated by means of another Infrastructure Canada program, such as the MR IF.

Application Process
The process to access the SIF (when funds are available) is flexible and has not been broadly advertised across government. In essence, potential projects are usually brought to the attention of the Minister of Infrastructure Canada by means of unsolicited overtures by territorial or provincial governments. Parties included in negotiations usually consist of the territorial or provincial government (usually this party is also a funding partner), an implementing department (Federal) and Infrastructure Canada. An assessment is then undertaken to ensure that eligibility

criteria are met and that proposals are analysed in detail (business case detailing costs and expectations, submission to Treasury Board drafted in consultation with TBS analysts and submitted for TB approval). Once all these steps have been taken, an announcement is made with regards to the project. SIF funds are available as soon as announcements have been made. It is useful to remember that the SIF is essentially a politically motivated program and that partnership with provinces and territories is essential in order to obtain approval.

Funding Profile
Funds are accessible to provinces and territories once they have been approved and announced. In general, a 10 year window for expenditures exists before funds lapse. Funds are not provided up front like grants — instead, invoices for approved expenditures are reimbursed up to the maximum expenditure level approved by Treasury Board. Total federal assistance from the SIF and other federal entities cannot exceed 75% of project costs.

Project Categories and Project Size
Categories for the types of projects that would be eligible for funding from the SIF include: highway or rail infrastructure; local transportation infrastructure; tourism or urban development infrastructure; water or sewage treatment infrastructure; and infrastructure prescribed by regulation (Canada Strategic Infrastructure Act). Since 2003, two new categories were added: northern infrastructure; and national projects. Funding for harbours in Nunavut could be accessed by means of a number of these categories should a new round of funding be allocated to the SIF in the future.

In Nunavut (and other provinces and territories where the populations are smaller than 750,000), the total eligible costs for each project must be at least $10 million. However, on an exceptional basis, thematic bundling of projects to allow jurisdictions to meet the thresholds for project size will be allowed at the discretion of the Minister of industry and Minister responsible for Infrastructure.

Infrastructure Canada Program (ICP)

In partnership with provincial, territorial and local governments, First Nations and the private sector, the objective of the ICP was to help to renew and build infrastructure in rural and urban municipalities across Canada. The ICP's first priority was green municipal infrastructure. Priority projects target water and wastewater systems, water management, solid waste management and recycling. Other program priorities include local transportation, roads and bridges, affordable housing, telecommunications and tourist, cultural and recreational facilities.

Current Status of ICP
Virtually all ICP funding has been committed. Under the ICP, Nunavut received $2.131 million by means of the Canada — Nunavut Infrastructure Program Agreement.

Application Process
Should future funds be available for distribution, three types of applicants can apply for funding under the ICP: local governments (as defined in the relevant provincial legislation), First Nations, and Corporate bodies (whether public or private, for example, non-government organizations, conservation authorities, whose project is nominated by the Government of Canada or by a province or territory). Applications can be made online[5].

[5] For more information, please consult the news following link: http://www.infrastructure.gc.ca/icp/howtoapply/howtoapply_e.shtml

Municipal Rural Infrastructure Program (MRIF)

The $1 -billion Municipal Rural Infrastructure Fund is part of the Government of Canada's latest contribution of $3 billion toward renewing Canada's public infrastructure (the additional $2 billion was provided to the SIF). The MRIF is designed to address the public infrastructure needs of Canada's municipalities and rural and remote areas, and First Nations communities.

Current Status of MRIF
Each province and territory and First Nations received a base allocation of $15 million, with the remaining funds allocated on a per capita basis. Nunavut's total share of the MRIF was determined to be $15 million. Currently, this funding has not been allocated to specific projects within Nunavut, meaning that the MRIF could potentially be a source of funds to be used towards fishing harbours. As the MRIF has not been spent yet, it is unlikely that new rounds of funding will be announced in the short term.

Application Process
The Government of Canada is currently negotiating with each province and territory to establish a formal mechanism to access the MRIF. Once this mechanism is established, project selection for the MRIF will be guided by joint federal-provincial/territorial Management Committees. A role for municipal associations will also be defined during these negotiations. For Nunavut, no management committee or municipal association has been set up at this time. Once these committees are set up, they (along with municipalities) will drive most project proposals[6].

The MRIF will be delivered federally through five regional agencies: Industry Canada (Ontario); Canada Economic Development for Quebec Regions (Quebec); Atlantic Canada Opportunities Agency (Atlantic); Western Economic Diversification (West); and Indian and Northern Affairs Canada (First Nations and the Territories).

Funding Profile
While funds will be accessible to provinces and territories once they have been approved and announced, the funding profile has not been clearly outlined. However, the stacking clause (total federal assistance from the Infrastructure Canada and other federal entities cannot exceed 75% of project costs) does apply to the MRIF.

Project Categories and Project Size
Categories for the types of projects that would be eligible for funding from the MRIF include: (Drinking) Water, Wastewater, Solid Waste, (Green) Public Transit, Local Roads, Cultural (i.e. museums, libraries, and other infrastructure), Recreational (i.e. facilities, other infrastructure), Tourism (including infrastructure to enable tourism), Municipal Environment Energy Improvements, and Connectivity. These categories are considered to be guidelines. Therefore, although fishing harbours aren't explicitly listed as an acceptable project category they could still be selected as projects as long as they meet the project selection criteria.

Besides the $15 million ceiling for Nunavut, no additional constraints have been clearly outlined with regards to project size. However, it is reasonable to assume that every community in Nunavut will seek a portion of the available funding.

[6] For more information, please consult the news following link:
http://www.infrastructure.gc.ca/mrif-fimr/publication/newsreleases/2004/20040212ottawa_e.shtml

Border Infrastructure Fund (BIF)

The $600-million Border Infrastructure Fund (BIF) supports the initiatives in the Smart Borders Action Plan by reducing border congestion and expanding infrastructure capacity over the medium term. This program cannot be used for infrastructure needs in Nunavut.

For a full description of Infrastructure Canada programs, please refer to the Infrastructure Canada website at: http://www.infrastructure.gc.ca/index_e.shtml

Transport Canada

Transport Canada (TC) is responsible for the transportation policies, programs and goals set by the Government of Canada. TC's vision is to have 'the best transportation system for Canada and Canadians" and the mission is "to develop and administer policies, regulations and programs for a *safe,* efficient and environmentally responsible transportation system".

TC's strategic objectives, as they relate to transportation, are to contribute to Canada's economic growth and social development, ensure high standards for a safe and secure transportation system and to protect the physical environment.

TC is split into four business lines (Policy, Program and Divestiture, Safety and Security, Departmental Administration) which in turn are split into a number of Service Lines. The Service Line most closely related to SCH in DFO is the "Port" Service Line in the 'Program and Divestiture' Business Line (see above figure).

One of TC's Strategic Objectives includes "...contributing to Canada's economic growth and social development". And while this Strategic Objective includes Infrastructure as a priority area, the trend in terms of harbours continues to be one of divestitures rather than acquisitions. However, while it is conceivable that some form of support could be obtained for initiatives in the North as long as the specific initiatives meet TC criteria of "Strategic Investments" as TC is committed to continuing to promote strategic investments in Canada's transportation system, indications have been that TC has no interest in getting back into the infrastructure business.

The main responsibility of the Port Programs and Divestiture Directorate includes divesting regional/local ports to locally-based port operators and negotiating contribution programs, such as the Port Divestiture and Transfer Funds rather than building any new infrastructure. In fact, in accordance with the federal government's National Marine Policy, Transport Canada is currently transferring ownership of its Regional / Local ports to local interests.

To summarise, TC does not appear to have a program that could provide tangible support to harbour development in the North since their whole focus has been towards divestitures. While TC has assumed a role in the North before, they clearly do not intend to begin constructing ports again. In fact, while a few remote ports are anticipated to be kept within the portfolio, TC would also divest these ports if they could find interested parties.

For a full description of Transport Canada programs, please refer to the Transport Canada website at: http://www.tc.gc.ca/en/menu.htm

Possible Funding Flexibilities

Construction of harbour infrastructure in the North involves multiple variables that could increase the funding flexibility required to ensure completion of the project while minimising administrative constraints. Some factors that come into play in managing this type of project are; the remoteness of locations, the seasonal nature of the construction period, the lifts required to bring material to location, the lead times involved in the planning horizon, specialised labour needs, etc.

The governmental Expenditure Management System (EMS) functions under a system of annual cycles of expenditures. In general, budgets are authorised on an annual basis and unspent funds may carry the risk of lapsing. While there are mechanisms that allow for the transfer of funds from one fiscal year to another (such as reprofiling or carry-forward of funds), these mechanisms are time-sensitive and are somewhat inflexible. Further financial flexibilities, in light of the unpredictable factors associated with capital projects in the North, could increase administrative efficiencies in managing such a project.

Although the following model under its current form would not be applicable, one example of the type of financial flexibilities that could be beneficial to building infrastructure in the North is the authority held by Infrastructure Canada, the government department whose mandate consists of constructing large capital projects. In effect, rather than approving an annual funding schedule as done traditionally, an overall amount could be allocated to a number of projects to be spent within a timeline that is greater than one year (ten years for example). Funds would be disbursed as needed, assuming that eligible activities are defined beforehand. This would provide the benefit of minimising the effort required to manage cash flow within current EMS constraints while ensuring that projects are completed as per established criteria. This structure has been used in the case of Infrastructure Canada projects.

An alternative to this structure that would also provide enhanced flexibility would be to include a clause to reprofile funds from one year to another without condition, as long as the funds are used towards their mandated purpose. There is precedent in DFO for this type of clause, which can be found in the Marshall Funds related to the Fisheries Access Program. The benefit obtained from this type of authority is to mitigate for the somewhat unpredictable nature of building infrastructure in the North. Alternatively, a clause could be included whereby unused funds are reprofiled automatically at the end of the fiscal year.

While this is by no means a comprehensive outline of the financial flexibilities that could be sought in the event of this initiative going forward, it does underline some of the concerns that would likely be considered during the latter stages of this program.