Strategic Plan for the Iqaluit Deepwater Port Project

Prepared for The City of Iqaluit by

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Executive Summary

The need for deepwater port facilities in Iqaluit has long been recognized. During the 1970s, a series of federal government studies led to preparation of a preliminary federal government engineering report in 1980 that recommended the construction of a concrete caisson wharf to handle the shipping of dry cargo and petroleum. However, the project did not proceed at that time, likely due to insufficient volumes of both cargo and petroleum products being shipped into Iqaluit to justify the costs.

Since 1980 the population of Iqaluit has grown from approximately 2,500 to well in excess of 6,000 and the Village of Iqaluit has become the capital city of the new territory of Nunavut. The annual volumes of dry goods and petroleum products being shipped to Iqaluit have increased dramatically and other marine activities such as the offshore fishery and tourism have also emerged as significant factors for consideration.

In 2005 the City of Iqaluit decided to spearhead a planning process for the establishment of deepwater port facilities at Iqaluit. Aarluk Consulting, Gartner Lee Limited and port planner Captain Chris Anderson were engaged by the City of Iqaluit to work on Phase 1 of the project – to conduct research and to bring together the various stakeholders to identify the opportunities and challenges in establishing integrated port facilities. This *Strategic Plan for the Iqaluit Deepwater Port Project* is the initial result of that decision, and is based on two planning workshops held with a broad group of stakeholders, an analysis of the earlier engineering study, and preliminary engineering, environmental and socio-economic investigations. The *Strategic Plan* examines current and projected usage, presents the initial concept and project description including preliminary estimates of capital and engineering costs, identifies potential direct benefits and economic spin-offs, and details phases required to plan for and realize the establishment of deepwater port facilities in Iqaluit.

Vision for the Iqaluit Integrated Deepwater Port

The objective of the planning process, defined in meetings of the Iqaluit Port Stakeholders Group, is to work towards the development of an Integrated Port Facilities Plan. All stakeholders agreed that planning for a deepwater port facility must address the needs of all users, not only large vessels, but also the mid-size and smaller vessels that use the harbour and are an essential element of the economy and future growth of Iqaluit and Nunavut.

The vision defined by the Stakeholders Group for the Iqaluit Integrated Deepwater Port Facilities is presented on the following page.

Vision Statement

To provide marine support services for the benefit of the residents of Iqaluit and for Nunavummiut at large in a manner that protects marine assets and:

- *supports a variety of users;*
- *ensures safe and timely access;*
- *supports the efficient shipping and trans-shipment of goods using the best environmental practices; and*
- *provides the infrastructure necessary to serve and promote local industries including tourism, commercial fishing, mineral exploration and traditional pursuits.*

User Groups: Current Issues and Needs

User groups utilizing the harbour area in Iqaluit include:

1. Dry cargo shipping (sealift)
2. Petroleum shipping
3. Fisheries
4. Tourist cruise ships
5. Coast Guard, military and research vessels
6. Small craft operators: hunters and fishermen, local tourism outfitters, and small cargo operators

The lack of adequate port facilities affects in varying degrees all user groups by hindering economic and business development, directly increasing costs, and creating significant, in some cases untenable risks. The need for integrated port facilities serving all user groups is clear and critical to the future development of the City and Nunavut as a whole.

General Cargo

Under the present system, general cargo shipped into Iqaluit is handled multiple times. At every handling, there is the potential for breakage and damage to cargo. In addition, the transfer of cargo to shore by barge introduces a significantly higher than normal risk of damage due to the rough water conditions that frequently prevail in the Iqaluit harbour area. The current lack of wharf facilities means that cargo can only be unloaded from the vessels for a few hours during each 24-hour period at high tide. All of these factors add significantly to cost of shipping.

Therefore, the needs of general cargo carriers in relation to a deepwater port facility include:

- Docking facilities allowing for unloading at all times throughout the day;
- Facilities to easily handle unloading of containerized cargo;
- Sufficient number of berths in a port facility to schedule and handle cargo shipments;
- A large, secure holding area for sealift cargo containers with direct access by vehicles.

Petroleum Products

The current method of unloading petroleum tankers creates a very high environmental risk, as well as creating a hazard for other vessels operating in the harbour. The increase in the volume of petroleum products shipped into Iqaluit within the last decade and the resulting extension of the petroleum shipping from the beginning of July to the end of November has created conditions that in turn increase exponentially the level of environmental risk, as well as the safety risks to workers. If a leak or spill were to occur, there would be very limited ability to mount an adequate response, with immense consequences in such an environmentally sensitive area.

In order to address the very significant issues facing petroleum re-supply, the needs of petroleum shippers in relation to a deepwater port facility include:

- A wharf for transfer of petroleum with a hydraulic oil transfer arm and direct access to the onshore petroleum pipeline;
- Implementation of best practices for the transfer of petroleum from tankers to shore facilities and for bunkering (refuelling) of vessels, which under current conditions and with existing facilities, it is not possible to put in place.

Fisheries

Currently, offshore vessels are fishing for shrimp and turbot in off-shore zones easily accessible to Frobisher Bay where significant shrimp and turbot quotas have been allocated to Nunavut organizations. All of these vessels operate out of southern ports, obtaining supplies, offloading project and carrying out crew changes in these ports. For the vessels fishing in waters accessible to Iqaluit, this involves up to a twelve day return trip to their home port and back to the fishing grounds, a major loss in fishing time. A port in Iqaluit could offer fisheries companies and vessels a viable alternative. Re-supplying vessels and offloading product in Iqaluit would reduce the round trip time required to only three or four days, with very significant reduction in expenses and in time lost fishing. At present this is not an option because of the lack of deepwater port facilities in Iqaluit. Current tidal loading and unloading make it too expensive and risky to undertake offloading of cargo, and resupply of goods and crew.

Therefore, needs in relation to development of deepwater port facilities for the fishing industry include:

- Facilities for docking and unloading palletized fish;
- Access to cold-storage facilities in Iqaluit;
- Access to reefer vessels to trans-ship product from Iqaluit to markets in Europe and Asia;
- Facilities and services for re-supply of vessels, repair and maintenance, and crew change.

Cruise Ships, Coast Guard and Military Vessels

Despite increased traffic of tourist cruise ships in the region around Baffin Island, most cruise ships currently bypass Iqaluit because the transfer of passengers to shore and back to ship is an extremely risky operation and can only be properly carried out when tides allow, and because of the lack of suitable re-supply and refuelling facilities in Iqaluit, with refuelling by floating pipeline once again being a very high risk operation.

Therefore the needs of cruise ship operators in relation to deepwater port facilities include:

- Convenient and safe means of transferring passengers between vessel and shore;
- Suitable and environmentally safe bunkering and re-supply services and facilities.

Coast Guard and Military Vessels

As is the case with other current users of the Iqaluit harbour, the refueling of Coast Guard icebreakers and of Navy vessels, as well as the unloading of crew in the Iqaluit harbour are high-risk operations. As a result, whenever possible Coast Guard and military vessels obtain refueling services direct from tankers or in other ports, rather than attempting to utilize services in Iqaluit.

The needs of Coast Guard and military ships in relation to deepwater port facilities are:

- facilities for safe and secure refuelling, re-supply and crew changes that are accessible throughout the tide cycle.

Small Craft

Small craft operators, including hunters and fishers, small cargo carriers and tourism operators, face major obstacles and risks associated with the operation of smaller craft in the Iqaluit harbour area. With tides of almost 12 metres, boats must be left out on the tidal flats. At the current breakwater, leaving and landing, and loading and unloading of small craft can be done only during the 1 to 2 hour period every 12 hours at high tide. For tourism operators, the timing of high tides means that tides occurring at suitable hours for loading clients into boats in the morning are available only every second week. No sheltered anchoring is available in the water all of the time, since the area protected by the present breakwater is dry for much of the tide cycle, and there is no designated boat storage area. As a result, there is extensive damage to boats. Refuelling of small craft is at present a high-risk procedure, and for small operators, insurance costs are prohibitive as a direct result of the lack of in adequate infrastructure in Iqaluit.

Needs of small craft operators in relation to integrated port facilities are:

- A dock or wharf providing access to boats throughout the whole tide cycle;
- A breakwater that would provide safe, protected anchorage during the full cycle of the tides;
- Facilities for safe re-supply, refuelling and repair of small craft, accessible at any tide, including a permanent fuelling facility;
- A designated area to haut out for maintenance and safe storage of small craft.

Preliminary Integrated Deepwater Port Concept

The preferred location for a deepwater berth facility is at Innuit Head, at the location currently serving as the terminus of the land based oil pipeline. The preferred location for a small craft facility is on the western side of the inlet, in the area immediately south of the existing boat ramp.

It is generally agreed that a deepwater berth of approximately 80 meters in length, with a working width of 18 meters, located to provide a water depth of 11.0 meters at the berth face would be capable of servicing the types of ships forecast to call at the facility. The berth length should allow ships to work

two deck cranes or be assisted with the use of a shore crane, or, in the case of oil takers, allow installation of suitable oil transfer arms. The proposed Deepwater Port Facility would include, as part of the overall Integrated Port Facilities, the following components:

- Road access to the site (from the existing boat ramp to Innuit Head)
- A proposed bridge crossing at "Canoe Passage"
- Development of a caisson type berth structure of approximately 80 meters in length, and berth approach causeway
- Development of a level terminal site area of approximately 2 hectares
- Provision of a 35 x 20 meter covered storage shed
- Provision of a 10 x 10 meter operations control building
- Upgrading of the on-shore oil pipeline and provision of a ship to shore oil transfer arm
- Provision of cargo handling equipment for port operations
- Extended distribution of utilities along the road access and within the terminal site.

For the small craft facility, the provision of three berthing floats, each of 30 meters length, would provide for mooring of 10 to 15 boats per float section for a total of 30 to 45 berths. In the event that the demand for moorage increases, the facility can be expanded by adding float extensions to the proposed structures. The proposed Small Craft Facility would include the following components as part of the overall Integrated Port Facilities:

- Road access to the causeway/ breakwater
- Development of a hardstand area adjacent to the existing boat ramp
- Development of a causeway /breakwater structure and adjacent hardstand area
- Provision of a 30x 30 metre piled small craft floats with two interconnection floats, and an access ramp.

A review was conducted of the proposed marine structure concepts developed in the 1980 (DPW) *Preliminary Engineering Report for the General Cargo Marine Terminal, Iqaluit, Nunavut*, primarily to assess the viability of the design concepts in light of more recent construction experience, and to upgrade the capital cost estimates for the marine structure component of the project. The four concepts reviewed were:

1. A design built Concrete Caisson (as per the 1980 DPW Report).
2. Steel Jackets, Concrete Elements and Steel Bridge with precast panels.
3. A combination Steel Pile Walls, Pipe & AZ and HZ.
4. Use of the existing (Tarsiut) Concrete Caisson and Vertical Sheet Pile Wall.

For this assessment, and specifically in development of project cost, a caisson structure has been proposed as a viable option, but it is noted that a more cost effective design may be presented at future stages of project development.

A simple assessment has been made of the level of berth occupancy that can be anticipated over the first twenty years of operation of the Deepwater Port Facility (between the years 2005 and 2025). The results

indicate that the berth is likely to operate at 40 to 45% occupancy level, which is considered a reasonable level of utilization for a single berth facility. Ships calling the berth should not experience excessive levels of queuing (or delays awaiting the berth). In the event that there is a substantial increase in the forecast number of ship calls at the berth beyond that noted in this report, it is considered feasible to incorporate an extension of the wharf to the south east by providing a second caisson (or alternative) berth structure.

Development of Integrated Port Facilities within the harbour area of Iqaluit is considered technically feasible. Capital cost estimates were calculated for each of these structural options, and detailed preliminary estimates for capital costs and operating costs for the entire Integrated Deepwater Port Facilities are included in the main report. A summary of estimated capital and operating costs is provided in the table below.

Estimated capital and operating costs for the integrated port facilities are shown in the table below. Note that all estimated costs are order of magnitude estimates only and will be refined at the final engineering stage.

Iqaluit Integrated Port Facilities:
Summary of Estimated Capital and Operating Costs

Deepwater Berth	$32,060,000
Deepwater Berth Equipment	$ 2,475,000
Deepwater Berth - Base Capital Cost	***$34,535,000***
Small Craft Harbour - Base Capital Cost	***$ 2,423,000***
Integrated Port Base Capital Cost Estimate	***$36,958,000***
Total Capital Cost Estimate, including engineering, approvals and contingency	**$49,228,056**
Annual Operating Cost Estimate	**$ 2,146,413**

The next phase of the project would progress all aspects of planning and facilities design to a feasibility level (or even to a detailed design level) of assessment, which in turn will provide a higher level of confidence in the capital and operating cost estimates for the project.

Benefits of Integrated Port Facilities

Construction of deepwater port facilities at Iqaluit will have a major impact on costs currently experienced by two of the current users of the Iqaluit harbour, general cargo and petroleum products, and by fisheries as a potentially significant future user of Iqaluit port facilities. While detailed estimates of costs and potential cost savings will be a key element of feasibility studies, this *Plan* provides an initial estimate of the cost savings to these three user groups, using the data outlined above in this section. For general cargo vessels, time spent in port unloading could be reduced by almost 80% compared to the

current situation, and for petroleum product vessels, it is estimated that unloading time could be reduced by 60%. If a deepwater port were available at Iqaluit, fisheries vessels could reduce the time lost fishing through trips to port for resupply, refuelling and product transfer by 6 days per trip on average. It is projected that this could provide the incentive for at least 8 fisheries vessels visit Iqaluit several times per season, where now there is less than 1 visit per year by a fisheries vessel.

This initial estimate of cost savings suggests that there could potentially be a savings to these user groups of between $3.4 and $4.9 million annually. When this figure is compared to the projected annual operating costs of port facilities, the indication is that there will be a reasonable potential for charging a level of user fees that will cover operating costs and provide for a viable operation, as well as a potential for reducing cargo and petroleum transportation costs. This would be a significant benefit for Nunavut, which has the highest cost of living of any jurisdiction in Canada. This does not take into account at this point additional user fees to be obtained from other user groups.

Direct employment will be created through the increased use of the Iqaluit deepwater port facilities by other user groups, and facilities geared to small craft users would immediately double the opportunities for local outfitters to provide boat tours to visitors and increased efficiency for small cargo vessels that potentially increase the level of operations and income. Other direct benefits for local small craft users would be access to boats during the entire cycle of the tides for re-supply, refuelling, loading, and offloading, a very significant reduction in damage through protected area for anchorage and designated safe storage area, and a major reduction in high insurance costs currently related to the lack of infrastructure.

Construction of integrated port facilities will create a safer working environment, and most importantly, the elimination of petroleum product transfer through a floating pipeline will make it possible to prepare proper spill contingency plans, creating a safer environment for transfer from petroleum tankers and refuelling of both large and small vessels.

The potential economic spin-offs of increased visitation to an Iqaluit port could be immense. Use by fishing vessels of the port of Iqaluit will require freezer storage space readily available for the offloaded frozen product. It will also require services for repacking, regrading and containerization of the product., and trans-shipment of the containerized product to market. These operations will provide not only increased use of the port, but also major economic spin-offs for the local economy in terms of increased employment, and increased business opportunities and income. Moreover, construction of port facilities is considered to be a necessary condition for the development and viable operation of a summer inshore fishery within the regional economy. Additional spin-off benefits would be created through services required for resupply of the all vessels, for repair and maintenance, and for accommodation and transportation involved in crew changes. Having crew changes carried out in Iqaluit rather than in southern ports may also make it easier to promote increased employment of Nunavut Inuit beneficiaries.

Environmental and Socio-Economic Assessment and Regulatory Requirements

In Nunavut, there are two key stages to approval of major projects. The first stage is the environmental assessment stage where project impacts and appropriate mitigation and monitoring is assessed by the proponent and then reviewed and approved through the Nunavut Impact Review Board or NIRB process. The second stage is the regulatory approval stage that gives a proponent the necessary permits and authorities to initiate development of the project. The environmental and socio-economic assessment and regulatory applications required for approval of the Integrated Deepwater Port Project should be completed in an integrated manner for ease of review and approval by government departments and boards, and use an "issues based approach" to ensure that programs are carried out in a strategic and seamless manner, and are developed in response to local concerns that have been raised during the initial planning stages of this project. Workplans for environmental and socio-economic baseline programs need to be shared with stakeholders and the general public with an emphasis placed on hiring and training local technical support personnel and services.

Project Phases

Eight project planning phases are outlined in the main report to provide general guidance and timing for the overall Integrated Deepwater Port Project. Funding for this project should occur in stages to correspond with the project planning phases, which allows for effective cash management and gives maximum flexibility as port concepts evolve. The flowing planning phases and schedule for the project are described in detail in the main report:

1. Initial Project Planning/Scoping (In progress – to March 2006)
2. Consultation (Throughout the planning project)
3. Integrated Port Plan and Feasibility Engineering (April 2006 – September 2006)
4. Baseline Programs (October 2005 – September 2008)
5. Final Engineering and Project Design (July 2006 – December 2006)
6. Environmental Assessment and Regulatory Approvals (October 2006 – June 2008)
7. Construction (July 2008 – December 2009)
8. Operation and Monitoring (Commencing October 2009)

Community Consultation

The approach to community consultation is based on the decision by the City of Iqaluit, as the lead organization co-ordinating the integrated port project planning, to form a Steering Committee which has subsequently grown into a larger Stakeholders Group. The Stakeholders Group provides a vehicle for the direct participation of all interested parties in the project direction and planning. The Stakeholders Group serves as a primary mechanism for input of information, concerns and support from the community, as well as for the dissemination of information and reports to all interested parties within the community.

Two major meetings of the Stakeholders Group have been held to date, in February and May of 2005., and Stakeholder consultations have been the basis for the definition of the vision, concept and project description for the integrated port project. The activities of the Stakeholders Group will be complemented by information and consultation sessions designed for the broader community of Iqaluit, and for other communities in Nunavut that will be impacted through construction and operation of the integrated port facilities.

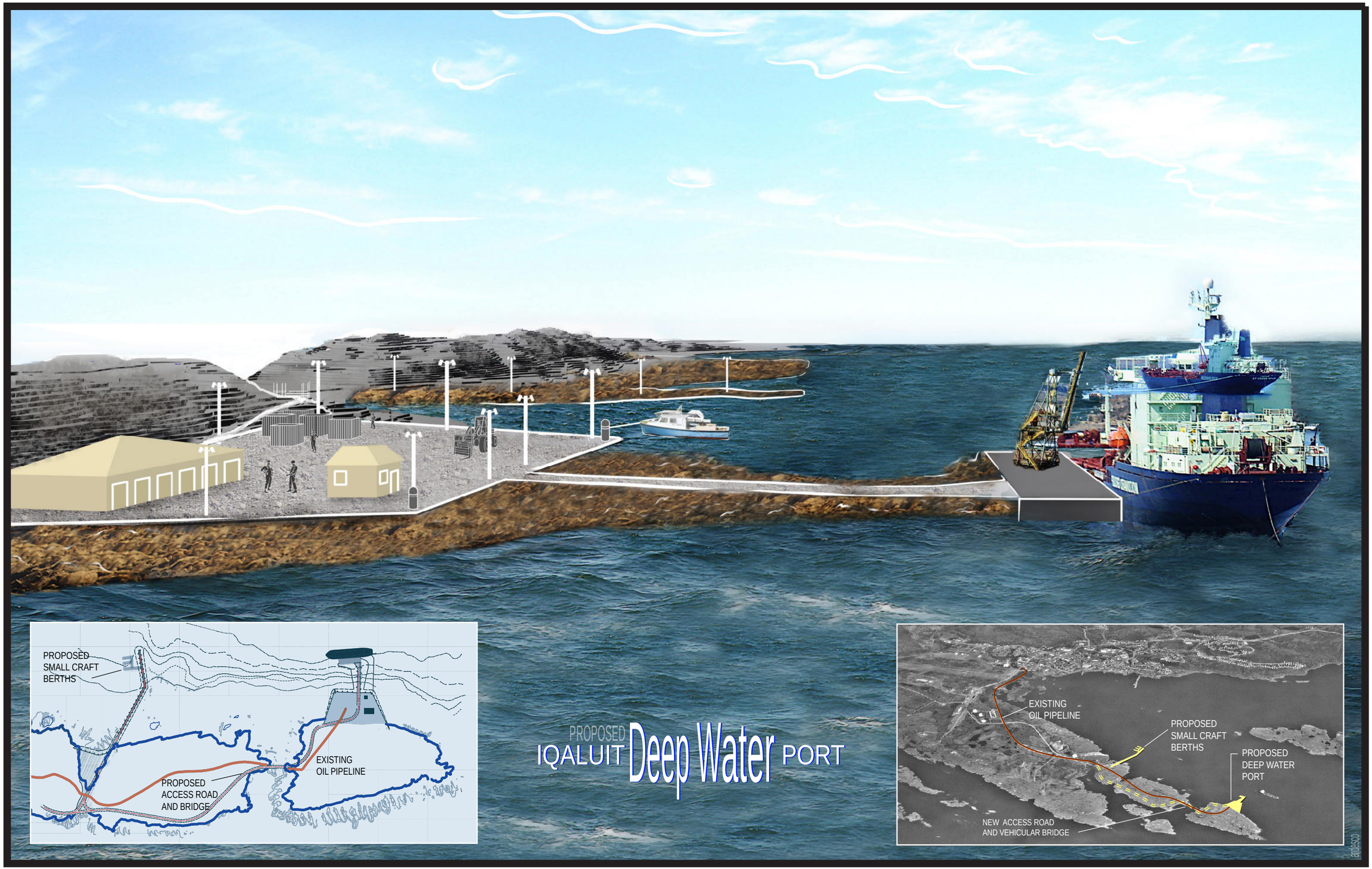
Intergovernmental Oversight Committee

It is recognized that in order to realize the ambitious objectives of this *Strategic Plan* for development of Integrated Port Facilities in Iqaluit, the active cooperation and participation of all three levels of government will be required. It is recommended therefore that an Intergovernmental Oversight Committee be formed, under the leadership of the City, including representatives of the three levels of government and Nunavut Tunngavik Inc. Membership for this Committee is described in Section 10 of the main report.

The preferred option for management of the Integrated Port Facilities identified in the Stakeholder workshops would be a tripartite management structure involving all three levels of government. It was suggested that this management structure would be appropriate during the formative operational stages, and might later be replaced by a public/private or independent management structure. While further detailed planning on management structure for the proposed Integrated Port Facilities is to be carried out, it is envisioned that the formation and work of the Oversight Committee would provide an appropriate means for planning and establishing the initial tripartite management body.

Conceptual Drawing of the Deepwater Port Site

On the next page we are showing an artist's rendition of what the proposed Deepwater Terminal facility might look like based on the preliminary information developed for the Strategic Plan.


PROPOSED
SMALL CRAFT
BERTHS
EXISTING
OIL PIPELINE
PROPOSED
ACCESS ROAD
AND BRIDGE
PROPOSED
IQALUIT Deep Water PORT
EXISTING
OIL PIPELINE
PROPOSED
SMALL CRAFT
BERTHS
PROPOSED
DEEP WATER
PORT
NEW ACCESS ROAD
AND VEHICULAR BRIDGE

1. Introduction

There has long been a recognized need for deepwater port facilities in Iqaluit resulting primarily from some of the highest tidal action in the world. Annual sealift operations during the open-water summer months are a particular challenge since cargo vessels must anchor in deep water, with goods transported to a beach holding area by barge. This is a time-consuming, labour intensive and expensive operation. During the 1970s, a series of federal government studies led to the preparation of a preliminary federal government engineering report in 1980 that recommended the construction of a concrete caisson wharf to handle the shipping of dry cargo and petroleum. In addition to the cumbersome process of dealing with dry cargo, another reason cited for constructing deepwater port facilities was the extremely high environmental risks associated with fuel transfer from petroleum tankers. Both of these considerations would have been addressed directly through the construction of the deepwater port recommended in the study to be constructed in the Iqaluit harbour at Innuit Head. Nevertheless, the project did not proceed 25 years ago likely due to insufficient volumes of both cargo and petroleum products being shipped into Iqaluit at that time to justify the costs.

Since 1980 the population of Iqaluit has grown from approximately 2,500 to well in excess of 6,000 and the Village of Iqaluit has become the capital city of the new territory of Nunavut. The annual volumes of dry goods and petroleum products being shipped to Iqaluit have increased dramatically and other potential marine activities such as the off-shore fishery and tourism have also emerged as factors for consideration.

Earlier this year the City of Iqaluit decided to spearhead the development of a planning process for the establishment of deepwater port facilities at Iqaluit. The starting points for this process were the earlier study completed in 1980 by Public Works Canada and some encouragement from both Government of Canada and Government of Nunavut senior officials.

This document is the initial result of that decision and follows an analysis of the earlier study combined with two Stakeholder workshops and initial investigations into some of the engineering, environmental and socio-economic considerations. The objective, based on the outcomes of the two workshops, is to work towards the development of an Integrated Port Facilities Plan for Iqaluit. This plan, when implemented will meet the long-term sealift needs and objectives for Iqaluit, and support local commercial and other small craft operations. An essential foundation for continuing the pursuit of this goal will be the continued involvement of an active stakeholders group representing current and potential users of the Iqaluit harbour and the proposed new port facilities. It is deemed to be critical to the success of the project that stakeholders participate fully in all stages of the planning.

One of the more significant new considerations that will impact on a port project will be the regulatory requirements that have evolved since 1980 and more specifically the co-management regime now in place as a result of the Nunavut Land Claims Agreement enacted by Parliament in 1993. Stakeholder workshops held in February and May of this year both focussed on this factor, which impacts on environmental, socio-economic, engineering and regulatory considerations.

Stakeholders agreed that the planning for a deepwater port facility must address the needs of all users. Planned facilities must serve not only large vessels, but also the mid-size and smaller vessels that use the harbour and are an essential element of the economy and future growth of Iqaluit and Nunavut. Final port concepts must meet local objectives for users in Iqaluit and at the same time provide benefits to all of Nunavut. Those participating in the planning process up to now include representatives from the following groups and agencies:

- City of Iqaluit
- Government of Nunavut, Legislative Assembly
- Government of Nunavut, Department of Environment
- Government of Nunavut, Department of Community Government and Services
- Amarok Hunters and Trappers Association
- Baffin Fisheries Coalition
- Qikiqtaaluk Corporation
- Local Cargo Hauling firms
- Nunavut Eastern Arctic Shipping (NEAS)
- Nunavut Sealink and Supply Inc. (NSSI)
- Uqsuq Oil
- Iqaluit Chamber of Commerce
- Nunavut Economic Forum
- Nunavut Tungavik Inc.
- Government of Canada, Department of Fisheries and Oceans
- National Defense

Aarluk Consulting and Gartner Lee Limited as well as a Port Planner, Captain Chris Anderson, were engaged by the City of Iqaluit to work on Phase 1 of the project to conduct the initial research and to bring together the various Stakeholders to identify the opportunities and challenges in achieving the goal of establishing integrated port facilities. This *Strategic Plan for the Iqaluit Deepwater Port Project* is the result of those efforts together with the input provided by stakeholders.

The plan details several phases required to plan for and realize the project and provides as well some preliminary cost estimates of each of the phases through to the construction and operation of the port. A preliminary identification of potential cost benefits and economic impacts are also included. It must be emphasized that these projected costs and benefits are at this point initial estimates and will require adjustments as each stage progresses. It must also be noted that the proposed timetable is also preliminary and in many respects should be considered somewhat ambitious since some environmental and engineering studies may result in additional work being completed at certain points, thus extending the timeframe.

2. Vision for the Iqaluit Integrated Deepwater Port

At the May Stakeholder workshop, representatives at the meeting prepared a draft vision statement for development of the Iqaluit integrated port facilities. It is included below with some minor adjustments.

Vision Statement

To provide marine support services for the benefit of the residents of Iqaluit and for Nunavummiut at large in a manner that protects marine assets and:

- *supports a variety of users;*
- *ensures safe and timely access;*
- *supports the efficient shipping and trans-shipment of goods using the best environmental practices; and*
- *provides the infrastructure necessary to serve and promote local industries including tourism, commercial fishing, mineral exploration and traditional pursuits.*

3. Integrated Port Facilities: User Needs

3.1 Introduction

The need for deepwater port facilities located in Iqaluit, serving the city, the region and all of Nunavut, was clearly recognized at least 25 years ago. However, initial plans for construction of the port were not implemented at that time. Since then, with the continued growth of Iqaluit and its designation as capital of Nunavut, the population of the city has almost tripled. With this population and economic growth, the need for port facilities has increased proportionately. However, despite the fact that Nunavut has a longer coastline than any other province or territory in Canada and that all communities in Nunavut except one are located on the ocean, Canadian infrastructure funds have not to date contributed to the construction of port facilities in Nunavut.

Groups currently making use of the harbour area in Iqaluit include the following:

1. Dry cargo handling: construction, other government and commercial, and private
2. Petroleum shipping
3. Fisheries
4. Tourist cruise ships
5. Coast Guard, military and research vessels

6. Small craft operators: hunters and fishermen, local tourism outfitters, and small cargo operators

The lack of adequate port facilities affects in varying degrees all user groups by hindering economic and business development, directly increasing costs, and creating significant, in some cases, untenable risks. As outlined in this section, the need for integrated port facilities serving all user groups is clear and critical to the future development of the City and Nunavut as a whole.

3.2 Shipping Season

The shipping season for large vessels and smaller local craft in the Iqaluit harbour has gradually expanded over the years to take up the entire open water season. Data provided by the Canadian Coast Guard on types of marine shipments to Iqaluit for the years 1992 to 2003 indicates that the earliest arrival in the harbour was June 26th and the latest departure was November 28th. Both of these dates were recorded for petroleum tanker shipments for the most recent year available, 2003.

A summary of initial and final shipping dates by user type is provided below.

Table 1. Iqaluit Harbour
Initial and Final Shipping Dates by Type of Vessel
1992-2003

	Initial Date	Final Date
General Cargo	June 30th	November 17th
Tugs	July 27th	October 22nd
Petroleum Products Tankers	June 26th	November 28th
Fishing Vessels	July 29th	November 13th
Passenger Ships	July 20th	September 4th
Coast Guard Icebreakers	June 26th	November 15th
Other Coast Guard / Navy Vessels	September 16th	September 29th

Source: Canadian Coast Guard

3.3 Historical and Projected Usage

3.3.1 General Cargo

There are two principal carriers of general cargo serving Iqaluit at the present time – Nunavut Sealink and Supply Inc. (NSSI) and Nunavut Eastern Arctic Shipping Inc. (NEAS). NSSI is majority owned by Arctic Co-operatives Limited, in conjunction with Desgagnes Transarctik, which operates four cargo vessels – the Anna Desgagnes, Cecilia Desgagnes, Mathilda Desgagnes, and Camilla Desgagnes. NEAS is majority owned by Inuit birthright corporations in conjuction with Transport Nanuk, a Canadian marine carrier that has operated in the North for almost half a century and operates two cargo vessels – M/V Aivik and M/V Umiavut. Both companies are headquartered in Iqaluit.

NSSI is the official carrier for the Government of Nunavut under the GN Eastern Arctic Re-supply Agreement of 2001. NSSI estimates that anywhere from 30% to 65% of their total shipping business per year is with the Government of Nunavut, depending on the number of government capital projects undertaken in any given year. Between 2001 and 2004, cargo volumes shipped by NSSI increased 33%, and for the year 2004, NSSI shipped just over 25,000 m³ (cubic metres) of goods to Iqaluit. While exact figures were not available, on average NEAS reports that they ship between 12,000 m³ and 15,000 m³ of goods into Nunavut per year. Based on this, an estimate of the total volume of dry cargo shipped to Iqaluit in the last five years is presented in the Table below. Between the years 2000 and 2004, cargo volumes increased by almost 20%.

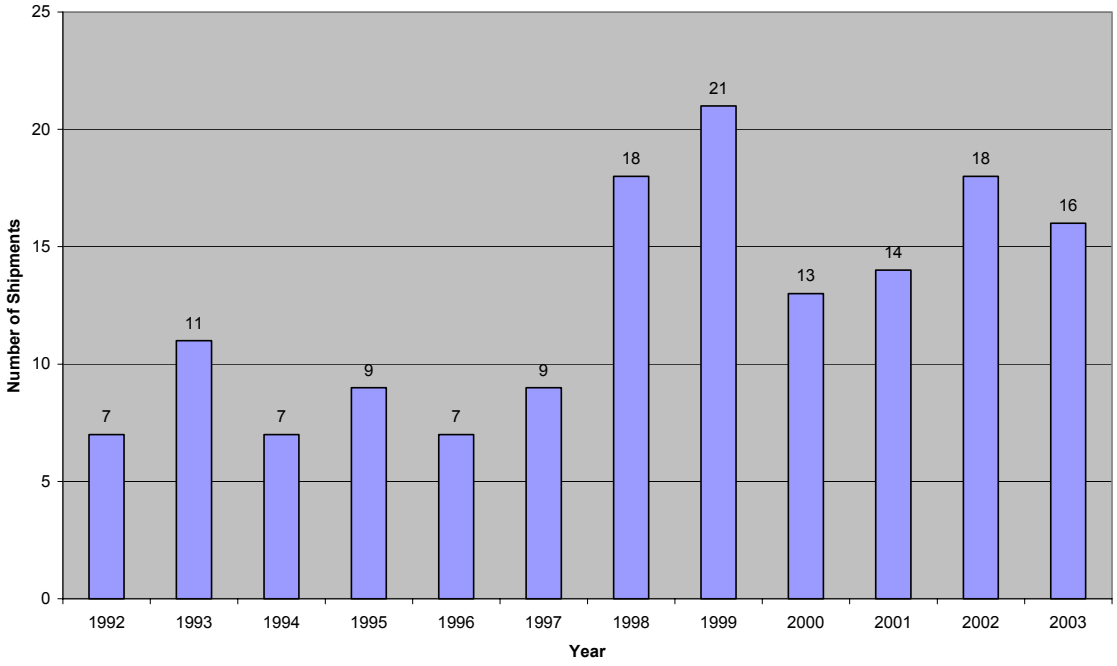
Table 2. Estimated Sealift Weights and Volumes Shipped to Iqaluit, 2000-2004

SEASON	VOLUME (m^3)
2004	39,171
2003	36,372
2002	32,318
2001	32,778
2000	32,783

Sources: NSSI and NEAS

For the years 1992 to 2003, the Coast Guard data provides data on the number of vessels visiting the Iqaluit harbour area. As shown in the graph below, there was in general a doubling of the number of cargo shipments in the six-year period 1998 to 2003 over the previous six-year period 1992 to 1997. The average number of cargo shipments made per season over the first six-year period was 8, while for the more recent six-year period the average number of cargo shipments was 17.

Chart 1. General Cargo: Number of Shipments to Iqaluit (1992-2003)



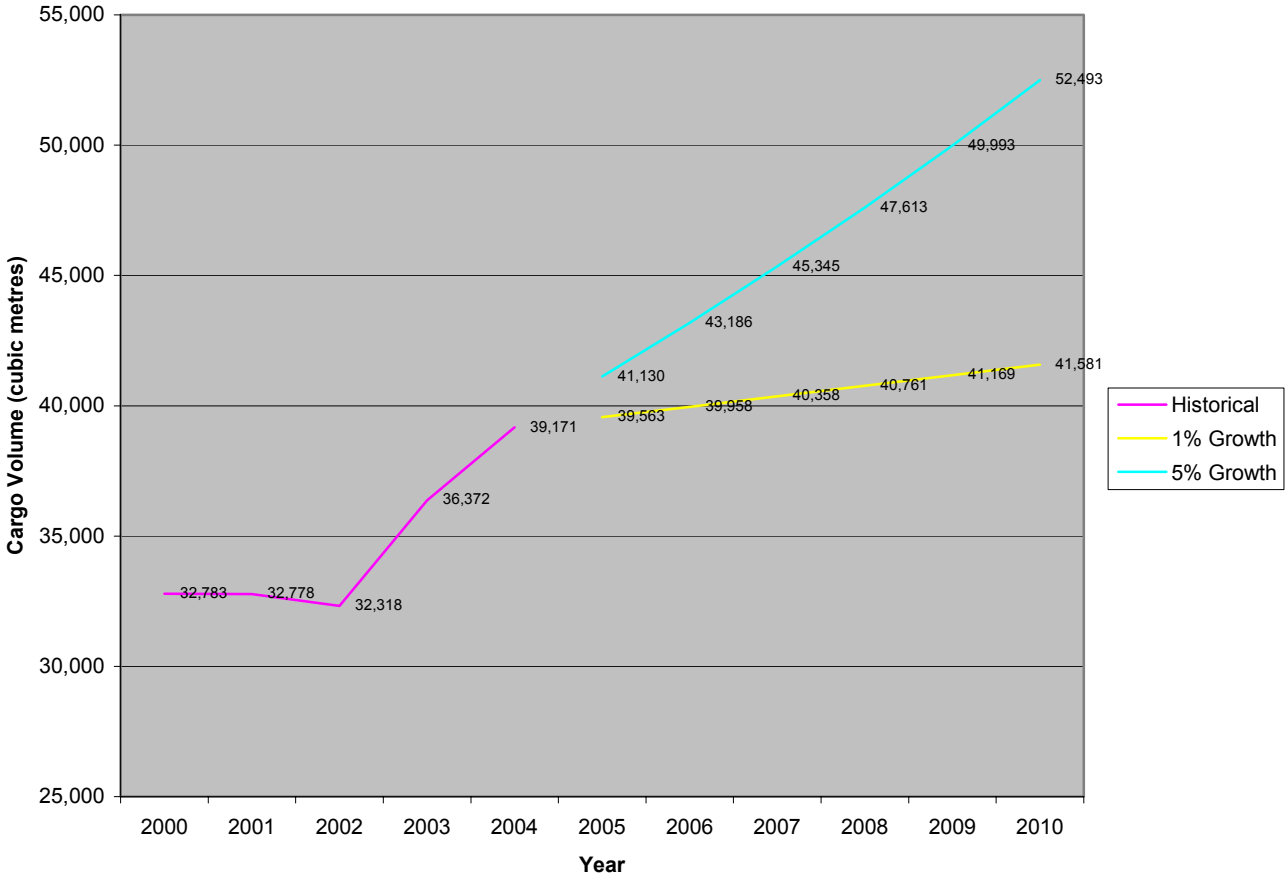
On average, the number of days spent in the Iqaluit harbour area for the purpose of unloading cargo for the years 1992 to 2003 was 4.2 days. For the more recent six-year period, 1998-2003, the average number of days spent in harbour was 4.1. As shown in the table below, the highest annual average time spent in harbour during these years was 5.1 days in 1992, while the lowest average amount of time spent was 3.2 days in 2002. The overall range of time spent in harbour was from 1 day to 14 days.

Table 3. General Cargo Vessels:
Days Spent Unloading in the Iqaluit Harbour Area,
Range and Average (1992-2003)

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Minimum Days Unloading	3	1	2	1	2	1	1	1	3	1	1	1
Maximum Days Unloading	8	7	5	11	7	9	9	15	12	10	7	14
Avg. Days Unloading	5.1	4.5	3.4	4.3	4.0	4.3	4.0	4.3	4.2	4.2	3.2	4.8

While it is unlikely that the rate of growth of cargo volumes in the past three years (20%) will be maintained, industry and government estimates place the projected growth at a minimum of 1 to 3%. At a maximum, it is possible that growth could attain an average rate of up to 5%. The following chart shows projected cargo volumes for the years 2005 to 2010, assuming both a conservative growth estimate of 1% per year and a more generous average growth estimate of 5% per year.

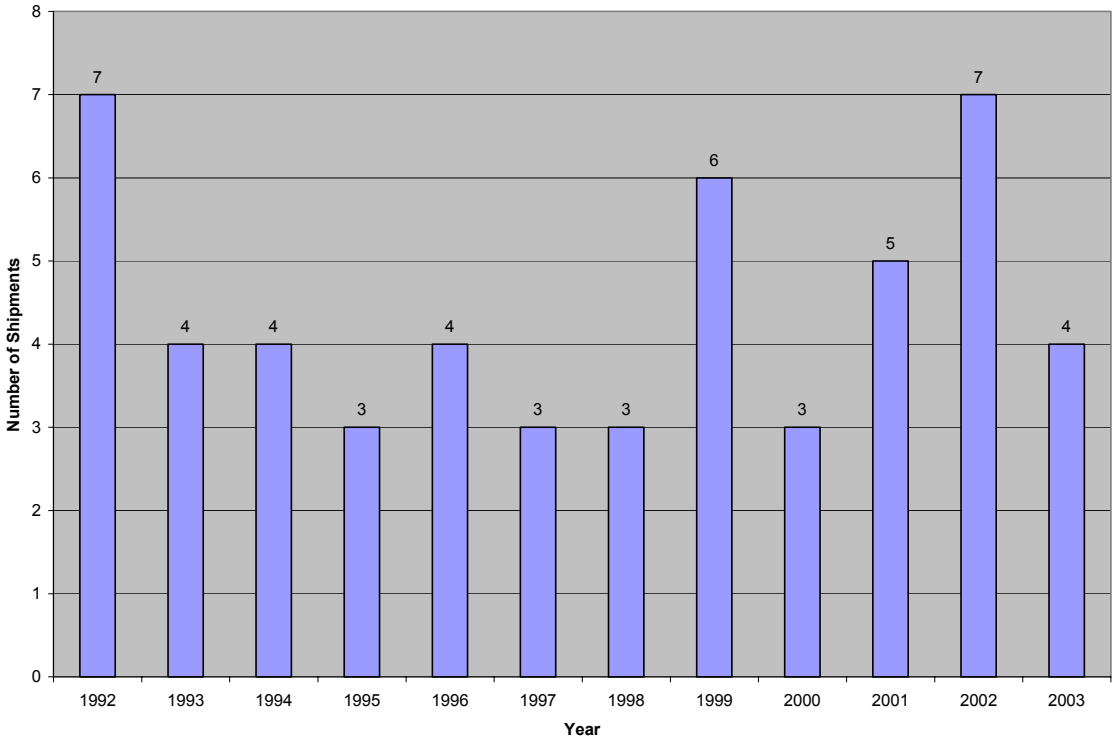
Chart 2. Projected Growth of Total Cargo Shipments



3.3.2 Petroleum Products

Coast Guard data on petroleum shipments show that from the years 1992 to 2003 there were 53 tankers delivering petroleum products to Iqaluit, an average of 4 tankers per year. Although the number of tankers delivering petroleum into Iqaluit over the years has remained fairly constant, as shown in the chart below, the size of the individual shipments has increased with time due to the growth of Iqaluit as a City and as the centre of government in Nunavut. The average number of shipments made per season over this duration was 4.4.

Chart 3. Petroleum Tankers: Number of Shipments to Iqaluit (1992-2003)



Specific data on the total volumes of petroleum products transported to Iqaluit were not available prior to the year 2003. The total volume of petroleum products delivered by tanker in 2003 was 59.7 million litres. While 2004 saw a 20% decrease in volume shipped to 47.7 million litres delivered, the projected volume for 2005 is 70.0 million litres, which would result in a 47% increase over 2004.

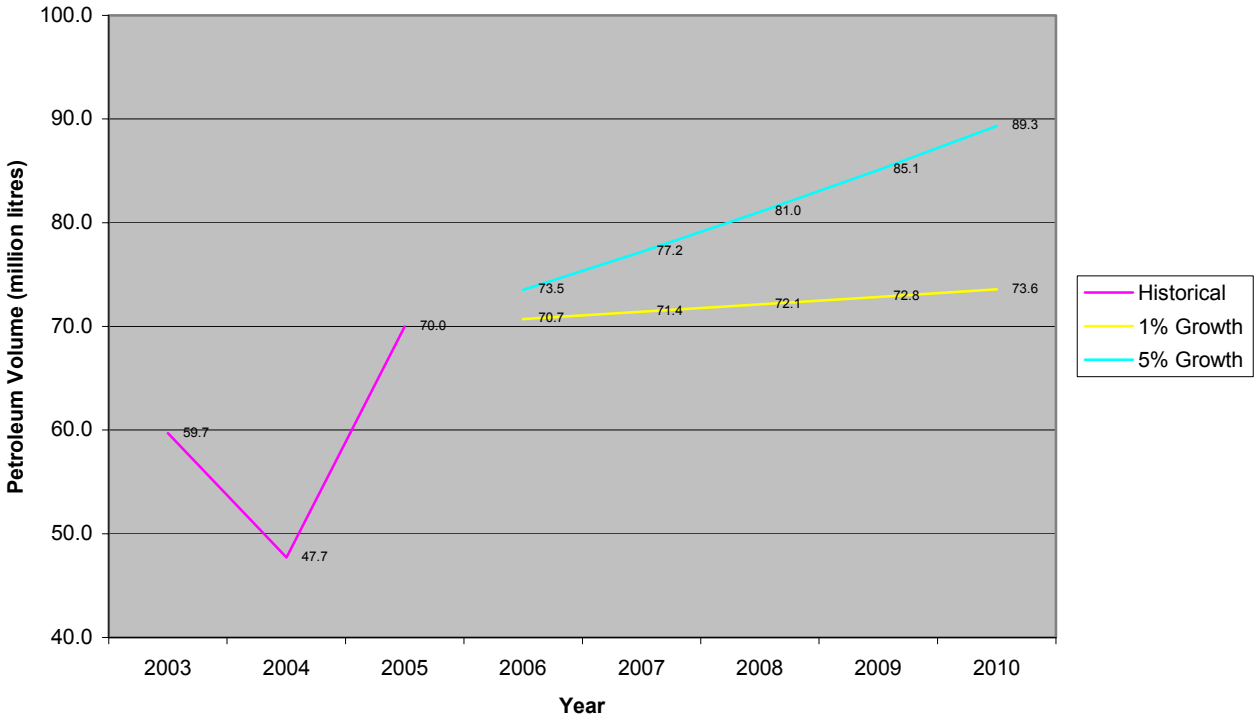
The average days spent in the Iqaluit harbour area transferring petroleum products for the years 1992 to 2003 was 3.9 days, as shown in the table below. The highest annual average during these years was 6.3 days in 2000, while the lowest average amount of time taken was 2.8 days in 1993 and 1994 respectively. The range of time spent in harbour was from 1 day to a maximum of 9 days.

Table 4. Petroleum Product Tankers:
Days Spent Transferring Products in the Iqaluit Harbour Area, 1992-2003

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Minimum Days in Unloading	1	2	2	2	2	4	3	2	3	2	1	2
Maximum Days in Unloading	7	3	3	5	4	9	6	4	7	5	5	5
Avg. Days in Unloading	4.1	2.8	2.8	3.7	3.5	5.7	4.0	3.8	6.3	3.4	3.6	3.3

The following are the projected petroleum volumes for the years 2005 to 2010, assuming both a conservative growth estimate of 1% per year and a more generous growth estimate of 5% per year.

Chart 4. Projected Total Petroleum Volumes Shipped 2005-2010



3.3.3 Fisheries

There are two fisheries currently operating in waters near to Iqaluit that have the potential for major impact on Iqaluit and Nunavut as a whole as a result of development of deepwater port facilities. These are the offshore shrimp fishery and the offshore turbot fishery.

The shrimp fishery is carried out in each of eight Shrimp Fishing Areas (SFA), established by the Northwest Atlantic Fisheries Organization (NAFO), that extend from Davis Strait south to Newfoundland. Qikiqtaaluk Corporation, the Inuit birthright development corporation for the Qikiqtani region located in Iqaluit, holds one and a half licences that allow them access to a total quota of 3,838 metric tonnes (mt) of shrimp from these Shrimp Fishing Areas.[1] In addition, a number of Nunavut-specific quotas have been established for the Shrimp Fishing Areas adjacent to Baffin Island in Shrimp Fishing Areas 0 to 4. The Nunavut Wildlife Management Board allocates these to Nunavut-based fisheries organizations. These quota holders include a number of Hunters and Trappers Organizations, Cumberland Sound Fisheries of Pangnirtung, and members of the Baffin Fisheries Coalition. Overall, in the Shrimp Fishing Areas 0 to 4 adjacent to Baffin Island, there is a Total Allowable Catch of 33,967

[1] Interview with Peter Keenainak, Qikiqtaaluk Corporation,

tonnes. Of this total, Nunavut-based organizations have access to 10,680 tonnes through their quota allocations, or 31% of the Total Allowable Catch[2].

The turbot fishery off Baffin Island is carried out in Davis Strait within two areas. NAFO Division A has a Total Allowable Catch of 4,400 mt, which is allocated entirely to Nunavut interests within the Baffin Fisheries Coalition. NAFO Division 0B has a Total Allowable Catch of 5,500 mt, of which 1,500 mt, or 27%, is currently allocated by the NWMB to Baffin Fisheries Coalition members, including an allocation to Cumberland Sound Fisheries for their inshore winter turbot fishery. The rest of the TAC for Division 0B is allocated to southern fishery organizations through a Developmental/Company Allocation and a Competitive Allocation, neither of which Nunavut organizations have access to. Therefore, Nunavut organizations hold about 60% of the Total Allowable Catch for division 0A and 0B combined.

Up to this point in time all of the shrimp and turbot quotas held by Nunavut organizations are contracted out to outside fishing organizations located mainly in Nova Scotia and Newfoundland, and the 14 factory/freezer trawlers fishing the offshore shrimp and turbot quotas are operated by southern fishery interests.[3] The vessels operate out of Nova Scotia and Newfoundland, taking on crews and supplies and landing catches in ports in these two provinces. Product may occasionally be landed in Greenland, but only very infrequently because of the high cost structure prevailing in Greenland and scheduling problems. Royalties generated from these contracts total approximately $4 million per year under current market conditions, typically 12 to 15% of the landed value of frozen-at-sea product, which therefore is in the range of $36 million per year landed at sea value.[4] Both offshore shrimp vessels and offshore turbot vessels employee Inuit as crewmembers, currently at a level of between 10% and 15% of total crew.

Generally, offshore fishing vessels do not travel to Iqaluit for services or resupply. Over the 12-year period from 1992 to 2003, only 11 fishing vessels have visited the Iqaluit harbour, an average of under 1 vessel per year.

Future use of the Iqaluit harbour on a more regular basis by offshore fishing vessels is entirely dependent on the construction of deepwater port facilities. Once these were established, it has been estimated that at least 50% of the vessels operating in the offshore fishery could choose to make use of the Iqaluit port for trans-shipment, resupply and crew change, since it involves a round trip of only 4 days from the fishing grounds whereas a return trip to Newfoundland can mean up to 12 days lost fishing time. The cost structure of a port in Iqaluit should also be significantly lower than the costs of using a port in Greenland. Each of the vessels could make between 2 to 5 landings per season at the port. This would mean between 14 and 25 landings per season, compared to an average of less than 1 vessel per season currently visiting Iqaluit.

[2] Nunavut Fisheries Strategy, p. 28
[3] The Baffin Fisheries Coalition is currently taking an ownership position in two of the ships, and Qikiqtaaluk Corporation is also considering the acquisition of a factory/freezer trawler for the offshore shrimp fishery.
[4] Overview of Nunavut Fisheries, 23

3.3.4 Cruise Ships

Most cruise ships operating in the Nunavut area bypass the community of Iqaluit. Reasons for this include a lack of suitable bunkering (refuelling) and resupply facilities and the significant difficulty and risk associated with transferring passengers between the cruise ship and the shore. Over the 12-year period from 1992-2003, Canadian Coast Guard records show only 6 cruise ships as visiting Iqaluit. Of 10 cruise ships custom-cleared in 2005 to visit Nunavut, it was possible to confirm 4 cruise ships itineraries, and none of these vessels will be landing at Iqaluit.

Table 5. Cruise ships Confirmed as Visiting Nunavut, 2005

Name	Maximum # of Passengers	Nunavut Communities on Itinerary
Kapitan Khlebnikov	112	Cambridge Bay, Cape Dorset, Pangnirtung, Resolute Bay
Name: Peregrine Mariner	110	Iqaluit, Nanisivik/Arctic Bay, Pond Inlet, Resolute Bay
Name: Clipper Adventurer	122	Clyde River, Iqaluit, Pond Inlet, Qikiqtarjuaq
Ushuaia	66	Cape Dorset, Kimmirut, Pangnirtung

In total, 36 cruise ships were customs cleared for visits to Nunavut during the years 2002 to 2005, as shown in the table below.

Table 6. Cruise ships to receive customs clearance for visits to Nunavut

Year	Number of Cruise Ships Customs Cleared
2002	6
2003	8
2004	12
2005	10

It is difficult to project with accuracy future landings of cruise ships at Iqaluit. However, given the incentive provided by deepwater port facilities, direct air connection to Montreal and Ottawa, re-supply services, and the attractions of a capital city, there is great potential for tourism development It is possible that cruise ship landings at Iqaluit may increase to at least 4 or more per season following construction of a deepwater port.

3.3.5 Coast Guard, Military and Research Vessels

Canadian Coast Guard icebreakers operate around the Iqaluit area, assisting general cargo and petroleum tankers in dealing with ice conditions during the shipping season. Over the twelve-year period from 1992 to 2003, 74 Coast Guard icebreakers have visited the Iqaluit harbour, an average of 6 annually.

In the same period however, only one Navy vessel has visited the Iqaluit harbour, in 2002. This was the HMCS Goose Bay, a Kingston-class coastal defence vessel.

Over the entire twelve-year period, there is no record of a research vessel visiting the Iqaluit harbour. According to the Nunavut Research Institute, there is only one research vessel that may visit Iqaluit this season, a vessel working on the Arctic Net Research Project of the University of Laval.

Given the current emphasis on sovereignty, it is quite possible that the number of military ships visiting Iqaluit will increase in the future if deepwater port facilities were available. With increased research into global warming, there may well be increased activity and visits by research vessels. However, it is difficult at this point to project actual numbers of ships that could be making use

3.3.6 Small Craft

The most active users of the Iqaluit harbour are the owners and operators of smaller craft, generally under 10 m in length. These operators include the very large number of hunters and fishers using the harbour as the base for the marine travel, small- and mid-scale tourism operators and outfitters, and smaller cargo carriers. A proper inventory and survey of smaller craft in Iqaluit has never been conducted, so little accurate data is available. Overall, the Department of Transport suggests that as a rough estimate there are well over 100 smaller boats using the harbour.

Throughout the current planning process for the Iqaluit integrated port facilities, all stakeholders have emphasized that the interests of small craft owners must be taken into account and accommodated in the development of marine facilities. The economic importance of hunting and fishing is sometimes overlooked, but it is critical to the economic health and development of the community. In the late 1980s, a number of studies were carried out in the Baffin region and other regions of Nunavut that found the contribution of wildlife harvesting to be 50% of the household income of Inuit families.[5] While more recent data is not available, and there may be some differences between Inuit families in Iqaluit compared to those living in smaller communities, there can be no question of the economic importance of hunting and fishing to families in Iqaluit and to the community as a whole.

Overall, it is projected that small craft ownership will increase as the population of Iqaluit increases. Development of integrated port facilities that serve small craft operators will also help increase the business opportunities for cargo carriers and tourism operators.

[5] See Weihs, F., R. Higgins, and D. Boult. 1993. A Review and Assessment of the Economic Utilization and Potential of Country Food in the Northern Economy (Royal Commission on Aboriginal Peoples), p. 30-31.

3.4 Issues and Needs in Relation to Integrated Port Facilities

3.4.1 General Cargo

Under the present system, general cargo shipped into Iqaluit can be handled at least four times, including transfers from ship to barge and from barge to shore, sorting on shore, and distribution to customers. At every occurrence of handling, there is the potential for breakage and damage to cargo. Since the risk of damage is estimated for each time goods are handled and taken into account in both the extent of crating used and the calculation of overall transport charges, the number of times goods are handled adds significantly to the cost of shipping. In addition, the transfer of cargo to barges and the unloading of cargo from barges to the shore also introduces a significantly higher than normal risk of damage due to the rough water conditions that frequently prevail in the Iqaluit harbour area.

Given the current lack of wharf facilities, cargo can be unloaded from the vessels for only a few hours during each 24-hour period at the occurrences of the high tides twice a day. This means that a vessel unloading operation may require several days, while the active unloading time is much less. Clearly, the number of days spent in harbour represents direct costs to a shipping company in wages, expenses, and reduced income from alternative shipments during the extended unloading periods, resulting in higher shipping costs.

Over the past number of years, there has been a trend for shipment of smaller items through sealift, and many items have been refused because they could not be handled securely and efficiently. The current trend for use of containers to ship general cargo will make it increasingly possible to accommodate the shipment of smaller items.

Therefore, the needs of general cargo carriers in relation to a deepwater port facility to address these issues include:

- Docking facilities allowing for unloading at all times throughout the day, independent of the tides;
- Facilities to easily handle unloading of containerized shipments and distribution of goods from containers;
- Sufficient number of berths in a port facility to adequately schedule and handle the volume of cargo shipments;
- A large, secure holding area for sealift cargo containers with direct access by vehicles.

3.4.2 Petroleum Products

The current method of unloading petroleum tankers involves anchoring in the Iqaluit harbour area off of Innuit Head, and hooking up a floating hose pipe from the tanker to the shore manifold. The various petroleum products delivered are separated by the use of an air plug.

The transfer of petroleum products by means of a floating pipe creates a very significant environmental risk for spills, as well as creating a hazard for other vessels operating in the harbour. Moreover, the increase in the volume of petroleum products shipped into Iqaluit within the last decade and the resulting extension of the petroleum shipping from the beginning of June to the end of November has created conditions that in turn increase the level of environmental risk exponentially.

By November the transfer of petroleum products is occurring with ice present, as well as with the increased likelihood of high winds and otherwise stormy weather that is prevalent at this time of year. This in itself increases greatly the possibility of an environmental accident. In addition, with the ice present and periods of 20-hour darkness, it is impossible to access the unloading location by water, and it not possible as well to adequately patrol the ship to shore pipeline nor the onshore pipeline. The work at this time of year is also very risky for the workers involved in the operation. As a result of these factors, if a leak or spill did occur, there would be very limited ability to mount an adequate response. Although no spills have occurred within the last decade in Iqaluit, there have been spills in other communities, including three spills by the tanker Tuvaq in 2003 and 2004.[6] If the method of transfer used in Iqaluit continues, it is only a matter of time until a major spill occurs in the Iqaluit harbour, with immense negative consequences in such an environmentally sensitive area.

Similar issues apply to the refuelling of vessels using the Iqaluit harbour, and as a result many vessels will not come into the Iqaluit harbour since they can't take on fuel there in an environmentally safe manner.

In order to address the very significant issues facing petroleum re-supply, the needs of petroleum shippers in relation to a deepwater port facility include:

- A wharf for transfer of petroleum, with a hydraulic oil transfer arm and direct access to the onshore petroleum pipeline;
- Implementation of best practices for the transfer of petroleum from tankers to shore facilities and for bunkering of vessels, which under current conditions and with existing facilities, it is not possible to put in place.

3.4.3 Fisheries

Currently the offshore vessels fishing for shrimp and turbot in waters or near Iqaluit are all operating out of southern ports, obtaining supplies, carrying out crew changes and offloading frozen shrimp and turbot product in these ports. For vessels fishing in waters near Iqaluit, this involves up to twelve day return trip to their home port and back to the fishing grounds, a major loss in time fishing. Occasionally, vessels unload in Greenland, but generally companies find the cost structure of Greenland ports too high, and prefer the longer trip to southern ports.

[6] *Hazardous Cargo Bulletin*, November 2004, http://www.hazardouscargo.com/Storage/IsgResourceFile/Nov-2004/26/hcb_novincident.pdf; see also *Tank and Petroleum Use Mishaps,* http://www.steeltank.com/library/Tank_Petroleum_Use_Mishaps/news-083104.pdf.

A port in Iqaluit could offer fisheries companies and vessels a viable alternative, as long as the cost structure for a port in Iqaluit was competitive. Re-supplying and offloading in Iqaluit would reduce the time for vessels up to twelve days to only three to four days, with very significant reduction in expenses and in time lost fishing. At present however, this is not an option because of the lack of deepwater port facilities in Iqaluit. Current tidal loading and unloading make it too expensive and risky to undertake offloading of cargo, and resupply of goods and crew.

Therefore, needs in relation to development of deepwater port facilities for the fishing industry include:

- Facilities for docking and unloading palletized fish;
- Access to cold-storage facilities in Iqaluit;
- Access to reefer vessels to trans-ship product from Iqaluit to markets in Europe and Asia;
- Facilities for re-supply of vessels, including food and gear;
- Facilities for crew change; and
- Re-supply of water for vessels lacking water-processing facilities on board and for removal of sewage.

3.4.4 Cruise Ships

Despite increased traffic of tourist cruise ships in the region around Baffin Island in the past few years, most cruise ships currently bypass Iqaluit because of a number of critical factors:

- Transfer of passengers to shore and back to ship is an extremely awkward and risky operation, because of the possibility of adverse weather conditions and rough water;
- Transfer of passengers can only be properly carried out at certain times because of the need to adapt to tidal realities, which may cause inconvenience to passengers, with tides much higher in Iqaluit than in other communities in the region;
- The lack of suitable bunkering (refuelling) and re-supply facilities in Iqaluit mean that cruise ships currently prefer to refuel from tankers rather than attempting the risky operation of refuelling by floating pipeline in Iqaluit.

Therefore the needs of cruise ship operators in relation to deepwater port facilities include:

- Convenient and safe means of transferring passengers between vessel and shore;
- Suitable bunkering and re-supply services and facilities.

3.4.5 Coast Guard and Military

The bunkering of Coast Guard icebreakers and of Navy vessels, as well as the unloading of crew in the Iqaluit harbour is a high-risk operation as outlined above. As a result, Coast Guard and military vessels obtain bunkering services direct from tankers or in other ports, rather than attempting to utilize services in Iqaluit.

The needs of Coast Guard and military ships in relation to deepwater port facilities in Iqaluit are for facilities for safe and secure bunkering and re-supply and crew changes that are accessible throughout the tide cycle.

3.4.6 Small Craft

For hunters and fishers in Iqaluit, a boat and motor is by far the largest capital investment made as part of the overall inventory of equipment required for hunting and fishing. These operators then face considerable obstacles and risks associated with the operation of smaller craft in the Iqaluit harbour area.

With tides of almost 12 metres, it is much too far to launch boats at low tie, and boats have to be left out on the tidal flats. At the current breakwater, leaving and landing, and loading and unloading of small craft can be done only during the 1 to 2 hour period every 12 hours at high tide. For tourism operators, the timing of high tides means that tides occurring at suitable hours for loading clients into boats in the morning are available only every second week. Also, there is no sheltered anchoring available in the water all of the time, since the area protected by the present breakwater is dry for much of the tide cycle.

There is no designated boat storage area at the waterfront, and current ad hoc storage areas are overcrowded. As a result, damage to boats from snow removal and snowmobile traffic has been extensive. For small operators, insurance costs are prohibitive, directly as a result of the lack of adequate infrastructure in Iqaluit for docking and storing smaller craft.

Refuelling of small craft is at present a high-risk procedure, since there is no proper fuel truck access to the shore and fuel has to be transferred to the boats in oil drums.

Needs of small craft operators in relation to integrated port facilities are:

- A dock or wharf providing access to boats throughout the whole tide cycle for loading and off-loading or all types smaller craft;
- A breakwater that would provide safe, protected anchorage during the full cycle of the tides;
- Facilities for safe re-supply, refuelling and repair of small craft, accessible at any tide, including a permanent fuelling facility to replace refuelling from drums;

- A designated area to haut out for maintenance and safe storage of small craft, possibly with a slip and trolley for facilitating removal of boats.

4. Preliminary Deep Water Port Concept

4.1 Facilities Location

The city of Iqaluit is located at the head of Koojesse Inlet. Access to the Inlet for deep sea shipping is by way of the natural deepwater channel to the east of Monument Island and Innuit Head. General Cargo ships currently anchor in the deepwater pocket lying northwest of Long Island, and lighter cargo (by barge) to a beach landing area at the head of the inlet. Oil tankers anchor adjacent to the eastern side of Innuit Head and discharge by floating pipeline to a shore pipeline connection located on the eastern side of Innuit Head. Small craft generally use the existing breakwater causeway that extends approximately 275 meters SW from the shore on the northeastern side of the inlet. The only other existing harbour facility is the boat ramp that extends approximately 250 meters east of the shore, and is located approximately 1 kilometer NNW of the oil tanker discharge location. A general site plan showing Koojesse Inlet and the foreshore areas around Iqaluit is presented in Figure 1.

The foreshore area of Koojesse Inlet is intertidal mud flats which are dry during times of low water. The preferred location for a deepwater berth facility is at Innuit Head, at the location currently serving as the terminus of the land based oil pipeline. There is reasonable water depth adjacent to the shore, and adequate area (between Innuit Head and the southern end of Polaris Reef) in which a large ship can be turned.

It is not recommended to attempt development of a small craft facility on the northern side of Koojesse Inlet. Mud flats extend approximately 1.0 km from shore, and it would require extensive breakwater structures (and or dredging) to provide a small craft facility which can be accessed at any stage of the tide. The preferred location for a small craft facility is on the western side of the inlet, in the area immediately south of the existing boat ramp. This area allows development of a small craft facility in water depths of 1 to 3 meters and can be protected by a causeway/breakwater constructed over the inshore reef south of the boat ramp.

The proposed road alignment and both the Deepwater and Small Craft Facilities are shown on Figure 2.

IQALUIT

Rock Ledges

Rock Ledge

LONG ISLAND

Rock Ledge

KOOJESSE INLET

White Top Ledge

Black Ledge

Polaris Reef

INNUIT HEAD

LEGEND:

- PROPOSED ROAD ALIGNMENT ℄
- TOPOGRAPHIC CONTOUR
- EXISTING PIPELINE
- STREAM

0 100 200 400

SCALE 1:10,000

DEPTH CONTOURS

- DRYING AREA
- 0m (LNT)
- 2m
- 5m
- 10m
- 15m
- 20m
- 30m

SPOT DEPTH

21.8 (12.0)

- METRE
- DECIMETRE
- FATHOM
- FEET

DATA SOURCES:

- CANADIAN HYDROGRAPHIC SERVICE CHART 7127 "KOOJESSE INLET AND APPROACHES".
- CITY OF IQALUIT "WWW.CITY.IQALUIT.NU.CA"

NOTES:

- DEPTHS ARE IN METRES AND ARE REDUCED TO CHART DATUM (LOWEST NORMAL TIDE), WHICH AT IQALUIT IS 5.9 METRES (19.5 FEET) BELOW MEAN WATER LEVEL (MWL).

PROJECTION: UTM, ZONE 19
TOPO. CONTOUR INTERVAL: 5m
DEPTH CONTOUR INTERVAL: VARIES

REVIEWED BY: CA
PREPARED BY: CCL
DATE ISSUED: NOT ISSUED
PROJECT NUMBER: 50-236
FILE NAME: Iqaluit Harbour Figures.dwg
REVISION: 0

Project: Iqaluit Deep Water Port
Location: Iqaluit, Nunavut
Client: City of Iqaluit

SITE PLAN

Gartner Lee

Figure No. 1

Path: T:\GIS\05019 - Iqaluit Port Study - 50236 - GIL\Iqaluit Figures\ Plotted on: Sep 21, 2005--4:59pm Edited by: Chonnie

KOOJESSE INLET

Black Ledge

Polaris Reef

AREA 3

AREA 4

INNUIT HEAD

N

LEGEND:

- PROPOSED ROAD ALIGNMENT ℄
- TOPOGRAPHIC CONTOUR
- EXISTING PIPELINE
- STREAM

0 50 100 200

SCALE 1:5,000

DEPTH CONTOURS

- DRYING AREA
- 0m (LNT)
- 2m
- 5m
- 10m
- 15m
- 20m
- 30m

SPOT DEPTH

$21_8(12_0)$

- METRE
- DECIMETRE
- FATHOM
- FEET

DATA SOURCES:

- CANADIAN HYDROGRAPHIC SERVICE CHART 7127 "KOOJESSE INLET AND APPROACHES".
- CITY OF IQALUIT "WWW.CITY.IQALUIT.NU.CA"

NOTES:

- DEPTHS ARE IN METRES AND ARE REDUCED TO CHART DATUM (LOWEST NORMAL TIDE), WHICH AT IQALUIT IS 5.9 METRES (19.5 FEET) BELOW MEAN WATER LEVEL (MWL).

PROJECTION: UTM, ZONE 19
TOPO. CONTOUR INTERVAL: 5m
DEPTH CONTOUR INTERVAL: VARIES

REVIEWED BY: CA
PREPARED BY: CCL
DATE ISSUED: NOT ISSUED
PROJECT NUMBER: 50-236
FILE NAME: Iqaluit Harbour Figures.dwg
REVISION: 0

Project: Iqaluit Deep Water Port
Location: Iqaluit, Nunavut
Client: City of Iqaluit

GENERAL LAYOUT

Gartner Lee

Figure No. 2

Path: F:\GIS\05019 - Iqaluit Port Study - 50236 - GLL\Iqaluit Figures\ Plotted on: Sep 21, 2005--4:15pm Edited by: Channe

It is assumed that the oil pipeline may be re-routed and or modified and upgraded to avoid conflict with the proposed road alignment, and an estimate has been prepared for the cost of bridging the Canoe Passage between the SW peninsula and Innuit Head.

4.2 Proposed Deepwater Facility

The demand for deepwater facilities has been assessed in section 4 of this report. The types and typical dimensions of ships which are forecast to call at the facility are summarized in Table 7 below.

Table 7. Forecast Ship Dimensions for Iqaluit Integrated Port Facilities

Ship Types	Ship Name	DWT	Ship Dimensions (in meters)			
			LOA	Beam	Depth	Draft
General Cargo / Container	Anna Desgagnes	17,850	173.50	23.05	13.70	10.00
Oil Tanker	N/A [1]	30,000	190.00	26.00	13.00	10.50
	Tuvaq	15,954	164.47	22.20	12.02	10.00
Passenger Ship	Peregrine Mariner		117.04	18.28	n/a	6.09
Coast Guard	Louis St Laurent		119.60	24.40	n/a	9.90
Fishing	Arctic Prawns		74.30	15.60	6.20	*5.80*

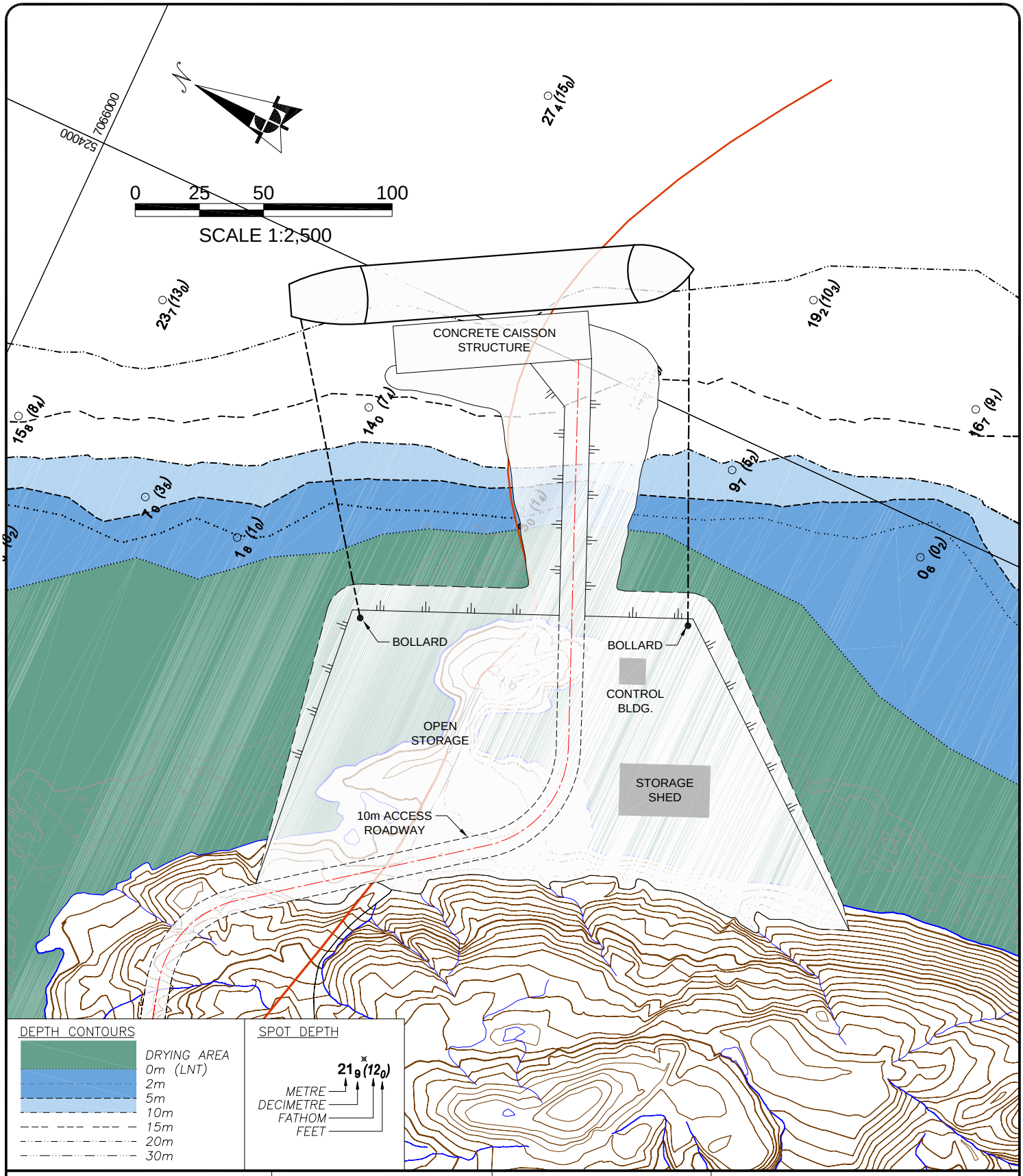
[1] It is reported that the largest oil tanker to call at the existing oil terminal was a 30,000 dwt ship

It is generally agreed that a berth of approximately 80 meters in length, with a working width of 18 meters, located to provide a water depth of 11.0 meters (Chart Datum) at the berth face would be capable of servicing the types of ships forecast to call at the facility. The berth length should allow ships to work two deck cranes (or be assisted with the use of a shore crane), or in the case of oil takers, allow installation of suitable oil transfer arms. It may be preferable to increase the depth of water at the berth face to 12 meters to allow larger oil tankers unrestricted access to the berth.

Oil product would be transferred by shore pipeline to the existing oil tank farm, and it is not anticipated that any support land will be required for oil storage facilities at Innuit Head. General cargo shipments will be discharge to support facilities at the Innuit Head Terminal. This will comprise a covered storage shed, and an open yard area in which containers and some general cargo can be stored awaiting distribution, or for consolidation of empty containers.

It is estimated that a storage shed of approximately 700 square meters will be adequate for short term storage of sensitive general cargo, or cargo stripped from containers. The actual demand for covered storage should be confirmed for final facilities design. An open storage yard of approximately 1 hectare is provided for storage of containers and general cargo which does not require covered storage.

A preliminary layout of the proposed Deepwater Facility is presented in figure 4, and the configuration of a typical caisson structure is presented in Figure 5.



LEGEND:

- PROPOSED ROAD ALIGNMENT ℄
- TOPOGRAPHIC CONTOUR
- EXISTING PIPELINE
- STREAM

DATA SOURCES:

- CANADIAN HYDROGRAPHIC SERVICE CHART 7127 "KOOJESSE INLET AND APPROACHES".
- CITY OF IQALUIT "WWW.CITY.IQALUIT.NU.CA"

NOTES:

- DEPTHS ARE IN METRES AND ARE REDUCED TO CHART DATUM (LOWEST NORMAL TIDE), WHICH AT IQALUIT IS 5.9 METRES (19.5 FEET) BELOW MEAN WATER LEVEL (MWL).

PROJECTION: NAD 83 ZONE 19
CONTOUR INTERVAL: 1m

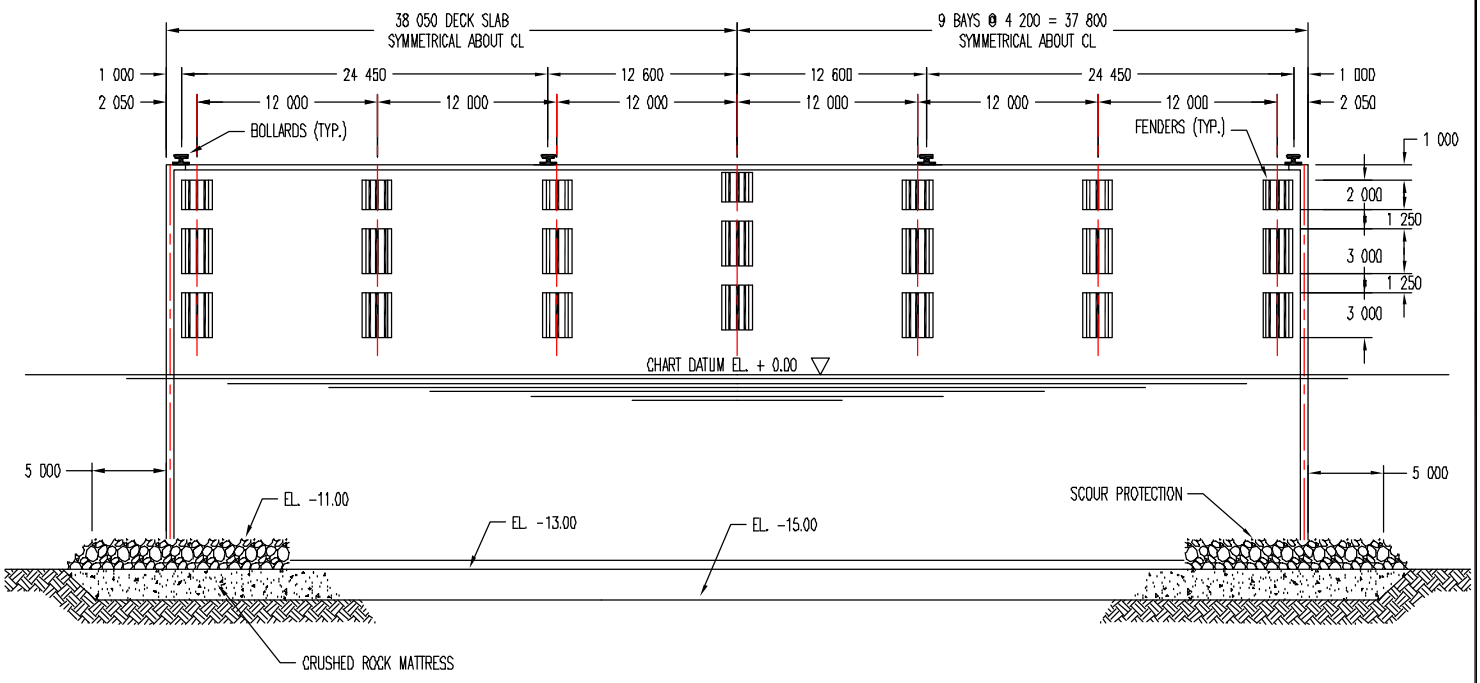
REVIEWED BY: AK
PREPARED BY: CCL
DATE ISSUED: AUGUST, 2005
PROJECT NUMBER: 50-236
FILE NAME: Iqaluit Harbour Figures.dwg
REVISION: 0

Project: Iqaluit Deep Water Port
Location: Iqaluit, Nunavut
Client: City of Iqaluit

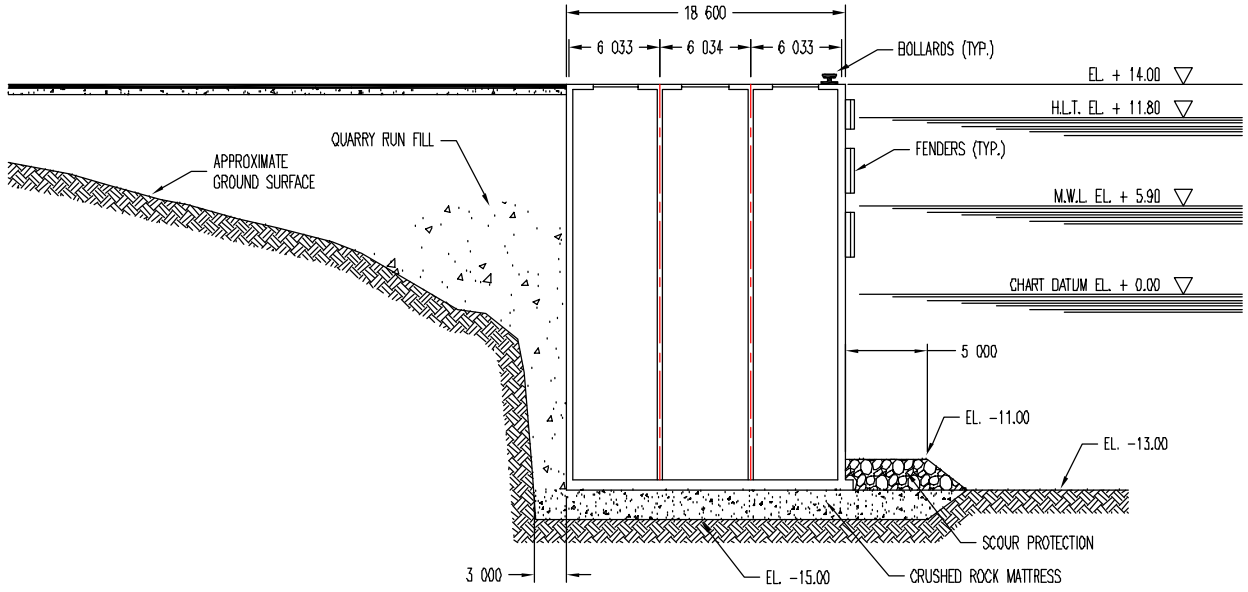
AREA 4
DEEP SEA TERMINAL

Gartner Lee

Figure No. 4



ELEVATION
1:500



SECTION ON CAUSEWAY CL
1:500

0 10 20
SCALE 1:500

LEGEND:	DATA SOURCES:	PROJECTION: CONTOUR INTERVAL:	Project: Iqaluit Deep Water Port Location: Iqaluit, Nunavut Client: City of Nunavut
	NOTES:	REVIEWED BY: CA PREPARED BY: CCL DATE ISSUED: AUGUST, 2005 PROJECT NUMBER: 50-236 FILE NAME: Caisson Detail.dwg REVISION: 0	**WHARF SECTION & FRONT ELEVATION** Gartner Lee Figure No. 5

In summary, the proposed Deepwater Facility would be comprised of the following components:

- Road access to the site (from the existing boat ramp to Innuit Head)
- A proposed bridge crossing at "Canoe Passage".
- Development of a caisson type berth structure (of approximately 80 meters in length, and berth approach causeway.
- Development of a level terminal site area of approximately 2 hectares.
- Provision of a 35 x 20 meter covered storage shed.
- Provision of a 10 x 10 meter operations control building.
- Upgrading of the on-shore oil pipeline and provision of a ship to shore oil transfer arm.
- Provision of cargo handling equipment for port operations.
- Extended distribution of utilities along the road access and within the terminal site.

4.3 Proposed Small Craft Facility

The proposed Small Craft Facility is presented in Figure 3. The proposed development includes the provision of a hardstand area (similar to the open storage area provided at the deepwater facility) adjacent to the existing boat ramp, suitable for storage of small boats and parking of vehicles.

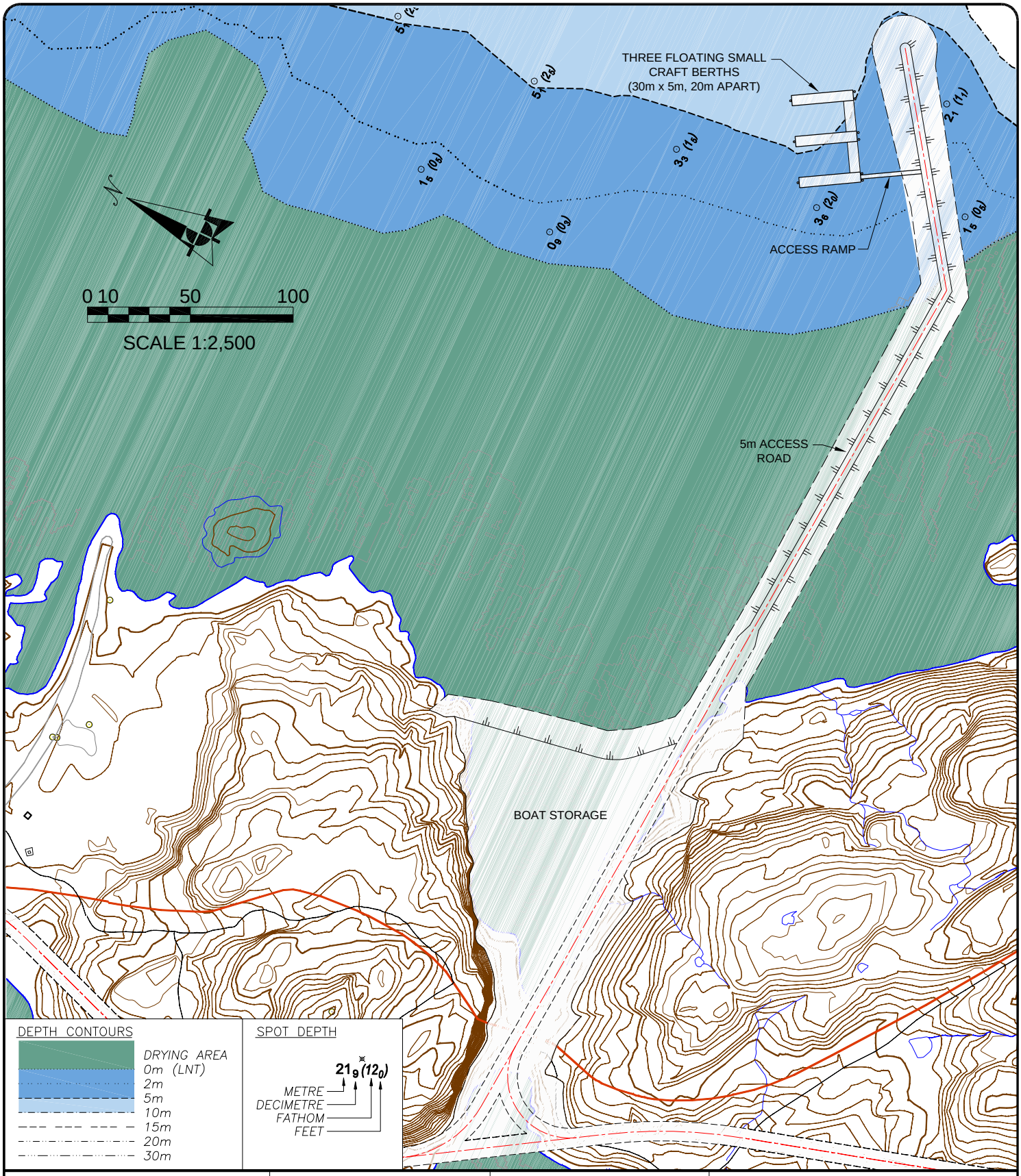
In addition, it is proposed to develop the area immediately south of the boat ramp, by providing a short section of road access and a causeway/breakwater structure over the inshore rock shelf. This will allow development of pile restrained small craft floats, which will allow summer access to boats at any stage of the tide.

There is no definitive information regarding the number of small craft in Iqaluit, but it is estimated to be in excess of 100 boats. The provision of three berthing floats, each of 30 meters length would provide for mooring of 10 to 15 boats per float section (if boats are double banked on one side of the float)for a total of 30 to 45 berths. In the event that the demand for moorage increases, the facility can be expanded by adding float extensions to the proposed structures.

Provision is also made for development of a second hardstand area adjacent to the inshore section of the causeway. This area could be used for installation of a "day" fuel tank which would service one berth of the mooring floats. It also provides for some parking and other ancillary uses.

In summary, the proposed Deepwater Facility comprise the following components:

- Road access to the causeway/ breakwater.
- Development of a hardstand area adjacent to the existing boat ramp.
- Development of a causeway /breakwater structure and adjacent hardstand area.
- Provision of a 30x 30 meter piled small craft floats with two interconnection floats, and an access ramp.



LEGEND:

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NOTES:

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PROJECTION: NAD 83 ZONE 19
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REVIEWED BY: AK
PREPARED BY: CCL
DATE ISSUED: AUGUST, 2005
PROJECT NUMBER: 00-000
FILE NAME: Iqaluit Harbour Figures.dwg
REVISION: 0

Project: Iqaluit Deep Water Port
Location: Iqaluit, Nunavut
Client: City of Iqaluit

AREA 3
SMALL CRAFT FACILITY

Gartner Lee

Figure No. 3

Path: T:\05\05019 - Iqaluit Port Study - 50236 - GLL\Iqaluit Figures\ Plotted on: Sep 21, 2005-4:40pm Edited by: Charone

4.4 Marine Structure for the Deepwater Berth

A review was conducted of the proposed marine structure concepts developed in the 1980 (DPW) *Preliminary Engineering Report for the General Cargo Marine Terminal, Iqaluit, Nunavut*, primarily to assess the viability of the design concepts in light of more recent construction experience, and to upgrade the capital cost estimates for the marine structure component of the project.

Four concepts were reviewed for the marine structure, namely :

1. A design built Concrete Caisson (as per the 1980 DPW Report).
2. Steel Jackets, Concrete Elements and Steel Bridge with precast panels.
3. A combination Steel Pile Walls, Pipe & AZ and HZ.
4. Use of the existing (Tarsiut) Concrete Caisson and Vertical Sheet Pile Wall.

Capital cost estimates were calculated for the purpose of upgrading the marine structure costs developed in the 1980 DPW report, and comparing the four structure concepts noted above. The results of this assessment are presented in tabular format in Table 8 below.

It is noted that Cellular (Cofferdam Style) "Sheet Pile Cells" were not considered in this particular assessment, but they are anticipated to be a viable alternative, and could be constructed at a cost similar to that of Concept 3, and that construction aspects of three of the four concepts have been built in the Arctic, the exception being the Steel jacket concept (Concept 2).

It is anticipated that all four concepts could be constructed during a two-season construction schedule period.

It is recommended that engineering/construction contract companies be approached to develop the most innovative and economical solutions for the design and construction of the marine structure. Concept 3 is considered to be a reasonably "traditional" structure design for Arctic waters and may attract more competitive bids.

To allow comparison with the 1980 DPW report, capital cost estimates presented in the project capital cost estimate are premised on a caisson type structure.

Table 8. NEW TERMINAL DEVELOPMENT (Wharf Concepts)

Concept	Cost	Benefits	Risk
1. Concrete Caisson Wharf	$21,584,000	• Weather and environment resistant • Low maintenance costs • 100% assured constructability • Indefinite service life	• Two seasons to construct. • Expensive marine tow and positioning costs. • Expensive purpose built structure. • Subcontract labour and schedule cost/delays. Only a few contractors in Canada are capable of bidding this design.
2. Steel Jackets, Precast Elements and Steel Bridge with precast deck panels.	$19,600,000	• Cost savings. • Single season construction schedule. • Limited dredging required.	• Design needs to be able to withstand ice loads. • Design requirement for small craft at Wharf face regarding fendering for tides and wind.
3.Combination Walls • Pipe and AZ Wall • HZ Wall	$17,978,000	• Cost Savings. • Potentially a free standing wall.(one tie back) • Pipe and AZ wall can have socket footings in limited overburden.	• Design is susceptible to sea and wind conditions. • Construction is tide and weather dependant • Includes two end “wing” walls allowing development of a wharf apron
4. Caisson Crib (Tarsiut) and Vertical Sheet Pile Wall	$18,589,000	• Costs Savings • No cost for caissons. • Remaining three caissons could be used for “small boat harbour” Break Water. • Potential for single season construction schedule.	• High cost of “marine lift” from Western to Eastern Arctic. • Wharf size would be smaller; 69m X 15m versus vs 79 X 20m.

Note: This comparison table presents costs ONLY for the marine structures component of the Deepwater Facility.

4.5 Cargo Handling Equipment

The Deepwater Facility will require cargo handling equipment to transfer cargo between the berth apron and the storage shed or yard, to strip cargo from containers, and to transfer cargo between storage facilities and trucks.

Typically, the equipment required to transfer cargo is as follows

- A mobile crane (a 150 tonne capacity crane is proposed) will allow offloading of barges that have no cargo handling gear; it can also be used to assist in conventional ship or fishing vessel discharge during low tide periods when it may not be feasible to use ships cranes for cargo discharge.
- A 40 tonne fork lift truck (with both fork and "top" container spreader attachments) will be used to transfer containers and larger units of general cargo.
- A 12 tonne capacity fork lift truck for intermediate units of general cargo.
- Two 3 tonne fork lift trucks, used for handling of smaller general cargo units, and stripping of containers.

In addition, it is assumed that an oil transfer arm will be provided for ship to shore transfer of oil products.

Capital cost estimates in this Plan include allowance for provision of these units of equipment.

4.6 Berth Occupancy

A simple assessment has been made of the level of berth occupancy that can be anticipated over the first twenty years of operation of the Deepwater Terminal Facility (between the years 2005 and 2025), and is presented in Table 9 below.

Table 9. Iqaluit Integrated Port Facilities
Berth Occupancy Assessment

Year 2005 **Product**	**General Cargo**	**Containers**	**Oil Products**	**Fish Products**	**Other ships**	**Total**
Type						
Movement	Import	Imp/Exp	Import	Import		
Annual Tonnage	6,000	12,400	43,000	8,400		
Annual Containers		775				
Ship calls/year	13	13	4	12	8	
Av Shipment Size	461.54	119.23	10,750.00	700.00		
Handling Prod (T or TEU/berth hr)	20	10	350	30		
Av B hrs/ship call	23.08	11.92	30.71	23.33		
Estimated Ops Hours per day	20.00	20.00	22.00	20.00		
Total B days/ship call	1.15	0.60	1.40	1.17	0.75	
Total B days/year	15.00	7.75	5.58	14.00	6.00	48.33
Available B days/year	98	98	98	98	98	
Berth Occupancy level (%/Annum)	**15.31%**	**7.91%**	**5.70%**	**14.29%**	**6.12%**	**49.32%**
Year 2015 **Product**	**General Cargo**	**Containers**	**Oil Products**	**Fish Products**	**Other ships**	**Total**
Type						
Movement	Import	Imp/Exp	Import	Export		
Annual Tonnage	5,490	16,958	52,460	10,248		
Annual Containers		1211				
Ship calls/year	13	13	4	18		
Av Shipment Size	422.31	186.35	13,115.00	569.33		
Handling Prod (T or TEU/berth hr)	22.5	12	400	35		
Av B hrs/ship call	18.77	15.53	32.79	16.27		
Estimated Ops Hours per day	20.00	20.00	22.00	20.00		
Total B days/ship call	0.94	0.78	1.49	0.81	0.75	
Total B days/year	12.20	10.09	5.96	14.64	0.00	42.90
Available B days/year	98	98	98	98	98	
Berth Occupancy level (%/Annum)	**12.45%**	**10.30%**	**6.08%**	**14.94%**	**0.00%**	**43.77%**
Year 2025 **Product**	**General Cargo**	**Containers**	**Oil Products**	**Fish Products**	**Other ships**	**Total**
Type						
Movement	Import	Imp/Exp	Import	Export		
Annual Tonnage	4,440	22,792	63,640	12,432		
Annual Containers		1,628				
Ship calls/year	13	13	5	20		
Av Shipment Size (Tonnes or TEU)	341.54	250.46	12,728.00	621.60		
Handling Prod (T or TEU/berth hr)	25	14	450	40		
Av B hrs/ship call	13.66	17.89	28.28	15.54		
Estimated Ops Hours per day	20.00	20.00	22.00	20.00		
Total B days/ship call	0.68	0.89	1.29	0.78	0.75	
Total B days/year	8.88	11.63	6.43	15.54	0.00	42.48
Available B days/year	98	98	98	98	98	
Berth Occupancy level (%/Annum)	**9.06%**	**11.87%**	**6.56%**	**15.86%**	**0.00%**	**43.34%**

Notes 1) An estimated average annual cargo growth rate of 2% is assumed
2) The percentage of Containerised cargo is assumed to increase annually
3) Container volumes include export of empty containers for general cargo & Fish product
4) Fish products are estimated at 700 T per ship call
5) Cargo Handling productivity increases have been assumed between years 2005 and 2025
6) Cargo Handling productivity rates incoroprate berthing,unberthing and documentation time.
7) Cargo Handling operations are premised on a three shift/day operation.
8) "Other" Ship Calls include passenger, CCG and other ships

These berth occupancy estimates are premised on an average increase of 2% per annum in general cargo and oil product shipments to Iqaluit. An allowance is also made for handling of fisheries product, (including increased annual volumes reefer type containers for transhipment of fish products), and for accommodation of other ships such as passenger ships and Canadian Coast Guard ships over a typical shipping season of approximately 98 days.

The cargo handling productivity rates for general cargo and containerized cargo are typical of those achieved at small multi-purpose berth facilities, and the cargo handling productivity rates noted for oil product discharge fall with the range of those achieved at the existing facility. Increases in cargo handling productivity are anticipated as experience is gained in port operations, and with increase penetration of containerized cargo.

The results indicate that the berth is likely to operate at 40 to 45% occupancy level, which is considered a reasonable level of utilization for a single berth facility. Ships calling the berth should not experience excessive levels of queuing (or delays awaiting the berth).

In the event that there is a substantial increase in the forecast number of ship calls at the berth (beyond that noted in this report), it is considered feasible to incorporate an extension of the wharf to the southeast by providing a second caisson (or alternative) berth structure.

4.7 Capital and Operating Cost Estimates

Preliminary cost estimates have been made for the Capital and Annual Operating costs of the integrated port facility. Detailed estimates are presented (in year 2005 Canadian dollars) in Tables 10 and 11 respectively below.

These estimates are intended for initial planning purposes only and will need to be refined as the preferred design of the port facilities is selected. .

4.8 Summary

The development of an Integrated Port Facility within the harbour area of Iqaluit is considered technically feasible.

A number of options are available with respect to the type of marine structure that is proposed for the berth itself. For this assessment, and specifically in development of project cost, a caisson structure has been proposed as a viable option, but it is noted that a more cost effective design may be presented at future stages of project development.

The next phase of the project would be to progress all aspects of planning and facilities design to a feasibility level (or even to a detailed design level) of assessment, which in turn will provide a higher level of confidence in the capital and operating cost estimates for the project.

Table 10. Iqaluit Integrated Port Facilities: Base Capital Estimate and Total Capital Estimate

Item	Unit	Qty	Unit Cost	Cost
				Cdn $
Deepwater Berth Capital Estimate				
Berth Structure	Lump Sum (LS)			20,000,000
Storage Yard	M^2	20,000	75	1,500,000
Storage Shed	M^2	700	750	525,000
Operations Bldg & furnishings	M^2	100	750	75,000
Site Utilities	LS			2,000,000
Road Access	Linear metre (LM)	1,600	850	1,360,000
"Canoe Passage" Bridge	M^2	800	2,500	2,000,000
Land Pipeline upgrade	L/M	1,800	750	1,350,000
Oil Transfer Arm	LS			1,750,000
Safety and oil spill gear	LS			1,500,000
Subtotal				**30,560,000**
Deepwater Berth Equipment Capital Estimate				
Mobile Crane (150 t capacity)	LS	1	1,500,000	1,500,000
Container Top Lift Truck (40 t Capacity)	LS	1	500,000	500,000
GC Handling Fork Lift Truck (12t)	LS	1	170,000	170,000
GC Handling Fork Lift Truck (5t)	LS	1	85,000	85,000
Container Fork Lift Truck (3t)	LS	2	60,000	120,000
Cargo Handling Gear (slings, ropes, shackles etc.)	LS			100,000
Subtotal				**2,475,000**
Deepwater Berth Total Capital Estimate				**33,035,000**
Small Craft Harbour Capital Estimate				
Road Access	L/M	250	850	212,500
Causeway/Breakwater	L/M	275	4,000	1,100,000
Boat Mooring Floats	M^2	700	300	210,000
Float Piling	per pile	16	7,500	120,000
Access Ramp	M^2	90	450	40,500
Storage Areas	M^2	10,800	50	540,000
Fuel day tanks and supply lines	L/S			200,000
Small Craft Harbour Total Capital Estimate				**2,423,000**
Integrated Port Base Capital Estimate				**35,458,000**
Port Facility: Base Capital, Environmental, Engineering and Contingency				
Base Capital Cost				33,035,000
Environmental assessment/regulatory approvals (@5 % of Capex)				1,651,750
Engineering (@ 6% of Capex)				1,982,100
Contingency (@20% of Capex)				7,003,420
Total Deepsea Facility				**43,672,270**
Small Craft Facility: Base Capital, Environmental, Engineering and Contingency				
Base Capital Cost				2,423,000
Environmental assessment/regulatory approvals (@5 % of Capex)				121,150
Engineering (@ 6% of Capex)				145,380
Contingency (@20% of Capex)				513,676
Total Small Craft Facility				**3,203,206**
Integrated Port Total Capital Estimate, with Environmental, Engineering and Contingency				**46,875,476**

Note- all costs are order of magnitude estimates only and will be refined at the final engineering stage

Table 11. Iqaluit Integrated Port Facilities: Estimated Annual Operating Cost[7]

Item	General Cargo/ Containers	Oil Products	Fish Products	Total
Annual Cargo Volume (metric tonnes)	10,000	43,000	8,400	61,400
Terminal Operating Components				
Est. cargo transfer rate(metric tonnes/berth hr)	22	350	30	
Est Ship Discharge Time (hours/annum)	455	123	280	
Operational Efficiency (working hours/available hours)	0.83	0.92	0.83	
Est Effective Ship Discharge Time (hours/annum)	545.45	134.03	336.00	
Est Effective Ship Discharge Time (days/annum)	22.73	5.58	14.00	
On-site Manpower requirements per shift (number)	14	4	6	
Est cost per hour per man & equipment (dollars per hour)	85	75	85	
Est man & equipment hours per annum	7,636	536	2,016	
Estimated operating costs per annum	**649,091**	**40,208**	**171,360**	**860,659**
Other Terminal Costs	**Capital Estimate**	**% of Cap. Est./yr**		
Terminal Facility Infrastructure Maintenance*	40,553,770	0.75%		304,153
Terminal Facility Equipment Maintenance	3,118,500	2.50%		77,963
Insurance	43,672,270	1.00%		436,723
Overhead & Management	43,672,270	0.25%		109,181
Total Other Terminal Costs				**928,019**
Base Est'd Annual Deepsea Facility Operations Cost				1,788,678
Contigency (at 20%)				357,736
Estimated Annual Deepsea Facility Operations Cost				**2,146,413**

*Note- include Capital estimate of 33,035,000 plus contingency

Note- all costs are order of magnitude estimates only and will be refined at the final engineering stage

[7] It is recommend that funding be acquired to support the Terminal Operating Costs forecast to be spent over the first five years of operations. This will allow the port authority to develop operational experience and market the port facilities over this critical star-up phase of operations.

5. Benefits of Integrated Port Facilities

5.1 Direct Benefits

5.1.1 Cost Savings

Construction of deepwater port facilities at Iqaluit will have a major impact on costs currently experienced by two of the current users of the Iqaluit harbour, general cargo and petroleum products, and by fisheries as a potentially significant future user of Iqaluit port facilities. While detailed estimates of costs and potential cost savings as a key element of feasibility studies, it is possible to provide an initial estimate of the cost savings to these three user groups, using the data outlined above in this section:

General cargo vessels:
For general cargo vessels, current ship days spent in port are calculated from the recent figures on average days in port, 4.1 days, and the average number of cargo vessels, 17 vessels annually. Overall, general cargo ships spend 70 days in port annually. It is estimated that with modern port facilities allowing for unloading through all phases of the tide cycle, reduced number of time handling cargo, a reduced level of cargo damage, and increased use of containerization, this could be reduced by almost 80%, to 15 days annually. In addition, general cargo vessels would save on the costs of lighterage (barging) currently required to transport cargo to the beach.

Petroleum products vessels:
Current annual ship days in port are 16 (an average of 4 vessels per year requiring 3.9 days average for transferring products). It is estimated that through reduced transfer time as a result of more efficient procedures and reduced risk, this could be reduced by a factor of about 60%, to 6 days annually.

Fisheries vessels:
Currently, fisheries vessels are travelling to ports in Newfoundland and Nova Scotia for unloading product, resupply and crew change, which requires from 8 to 12 days for the return trip to port and back to the fishing grounds, depending on the location of the port. If an average of 10 days is used as the current number of days required, this could be replaced by a round trip of 4 days for the projected minimum of 8 fisheries vessels visiting a port at Iqaluit an average of 3 times per season in the future. The results would be very significant cost savings for fisheries vessels, increased fishing time and greater volume of catch where quotas are not currently being filled, and vastly increased visitation to Iqaluit by fisheries vessels (up from an average of less than 1 visit per year).

The initial estimate of cost savings for these three user groups, based on low and high estimates of operating costs per day for vessels, is presented on the following page. The costs estimates are calculated in real terms, that is, inflation has not been factored in at this point.

This initial estimate of costs savings suggests that there could potentially be a savings to these user groups of between $3.5 and $4.9 million annually. When this figure is compared to the project annual operating costs of port facilities, the indication is that there will be a reasonable potential for charging a level of user fees that will cover operating costs and provide for a viable operation, as well as a potential for reducing cargo and petroleum transportation costs. This would be a significant benefit for Nunavut, which has the highest cost of living of any jurisdiction in Canada. This does not take into account at this point additional user fees to be obtained from other user groups.

Table 12. Estimated Cost Savings to General Cargo, Petroleum Products, and Fisheries Users From Construction of Deepwater Port Facilities

	General Cargo		Oil		Fish		Total	
	Low Range	High Range	Low Range	High Range	Low Range	High Range	Low Range	High Range
Current Annual Ship Days in Port or Transit	70	70	16	16	240	240		
Forecast Annual Ship Days at Berth or Transit	12	12	6	6	96	96		
Variance in Annual Port/Berth time or Transit	57.7	57.7	9.6	9.6	144	144		
Estimated Cost per Ship day	25,000	35,000	35,000	45,000	7,000	10,000		
Estimated Annual Ship Cost Savings	1,442,500	2,019,500	336,000	432,000	1,008,000	1,440,000	**2,786,500**	**3,891,500**
Estimated Lighterage cost per day	10,000	15,000					**10,000**	**15,000**
Estimated Lighterage cost per annum	697,000	1,045,500					**697,000**	**1,045,500**
Total Annual Estimated Cost Savings	**2,139,500**	**3,065,000**	**336,000**	**432,000**	**1,008,000**	**1,440,000**	**3,483,500**	**4,937,000**

5.1.2 Increased Use of Port and Port Services by Other User Groups

In addition to the cost savings and associated benefits to the three user groups outlined above, there would potentially be increased use of the Iqaluit port by other user groups identified previously. This includes visits by cruise ships including Iqaluit in their tour schedules and docking for services such as tour passenger changes, resupply and bunkering. There may also be increased use by military Canadian Coast Guard and military vessels for resupply, bunkering and crew change.

Port facilities geared to small craft users would immediately double the opportunities for local outfitters to provide boat tours to visitors, and increased efficiency for small cargo vessels in time required for anchoring, loading and unloading could potentially increase the level of operations and income.

Other direct benefits for local small craft users would be:

- access to boats during the entire cycle of the tides for re-supply, refuelling, loading, and offloading;

- a very significant reduction in damage through protected area for anchorage and designated safe storage area;
- a major reduction in high insurance costs currently related to the lack of infrastructure.

5.1.3 Direct Employment

Direct employment will be created through the operation of the integrated port facilities providing services to all port users. The total projected employment created and wages paid will be the subject of future feasibility analysis.

5.1.4 Environment and Safety

Construction of integrated port facilities will create a safer working environment through the elimination for general cargo of barge transfer across water that frequently takes place in rough seas, and the creation of safer working conditions for the transfer of petroleum products. It will also eliminate hazards from other vessel operators currently encountering the floating pipeline used for the transfer of petroleum products.

Most importantly, the elimination of petroleum product transfer through a floating pipeline will make it possible to prepare proper spill contingency plans, which as discussed above is currently impossible. It would also created a safer environment for refuelling of both large and small vessels, which currently involve environmentally high risk operations.

5.2 Spin-Off Benefits

5.2.1 Fisheries

The potential economic impact of increased visitation to an Iqaluit port could be immense. Use by fishing vessels of the port of Iqaluit will require freezer storage space readily available for the offloaded frozen product. It will also require services for repacking, regrading and containerization of the product. The containerized product could then be trans-shipped via a large container ship that would transport the product to market. This may entail up to three containerships each season, based on the volume of fisheries product.[8] These operations will provide not only increased use of the port, but also major economic spin-offs for the local economy in terms of increased employment, and increased business opportunities and income. The large volumes of fisheries products being shipped out of Iqaluit would greatly increase the current low levels of backhauled cargo, and could possibly result in reductions in overall cargo rates.

[8] Interview with Jerry Ward, Baffin Fisheries Coalition.

Additional spin-off benefits would be created through services required for resupply of the fisheries trawlers, and accommodation and transportation services for crew changes. Having crew changes carried out in Iqaluit rather than in a southern port may also make it easier to promote increased employment of Nunavut Inuit beneficiaries on offshore fisheries vessels. Resupply would include both food services and other marine goods including parts and fishing supplies. Repair and maintenance services, including welders and mechanics would also be in demand.

Finally, construction of port facilities is considered to be a necessary condition for the development and viable operation of a summer inshore fishery within the regional economy. One option proposed for development of the inshore fishery is for communities to use small inshore vessels that would fish in areas around the communities, then off-load their catch to a large regional collector that could transport the product to a port like Iqaluit for processing, storage and trans-shipment.[9]

5.2.2 Provision of Services for Other User Groups

There would also be demand for services from the increased use of the port by other user groups, such as cruise ships and Coast Guard and military, that would impact on both employment and business opportunities and income. These services would include:

- Refuelling
- Resupply of food
- Resupply of parts and maintenance services
- Passenger and crew changes – accommodation and transportation services.

5.3 Further Studies

A full cost/benefit analysis will form part of future comprehensive feasibility studies to be carried out as part of the Iqaluit integrated port planning process. This will include further research and detailing of operational revenues and costs, and further elaboration and quantification of direct and indirect economic benefits provided by the project.

6. Environmental and Socio-Economic Assessment and Regulatory Requirements

The Iqaluit deepwater port facility is to be located on commissioner's land within the municipal boundaries of the City of Iqaluit. The proposed Iqaluit Port Project will require approval from a number of territorial and federal government departments and boards depending on the final project scope. The environmental assessment and regulatory applications required for approval of this project will be

[9] Overview of Nunavut Fisheries, p. 8.

completed in an integrated manner for ease of review and approval by government departments and boards. The environmental assessment and supporting baseline programs will also use an "issues based approach" to ensure that programs are carried out in a strategic and seamless manner. This approach has been developed in response to local concerns (e.g. use of explosives) that have been raised during the initial planning stages of this project. Workplans for environmental and socio-economic baseline programs will be shared with stakeholders and the general public and there will be an emphasis placed on hiring and training local technical support personnel and services.

There are a number of territorial and federal government departments and boards that will play key roles in the assessment and approval of this project. In Nunavut, there are two key stages to approval of major projects. The first stage is the environmental assessment stage where project impacts and appropriate mitigation and monitoring is assessed by the proponent and then reviewed and approved through the Nunavut Impact Review Board or NIRB process. The second stage is the regulatory approval stage which gives a proponent the necessary permits and authorities to initiate development of the project.

The following is a synopsis of approvals that are required and is not intended to represent all the approvals that will be required at all stages of this project.

6.1 Environmental Assessment

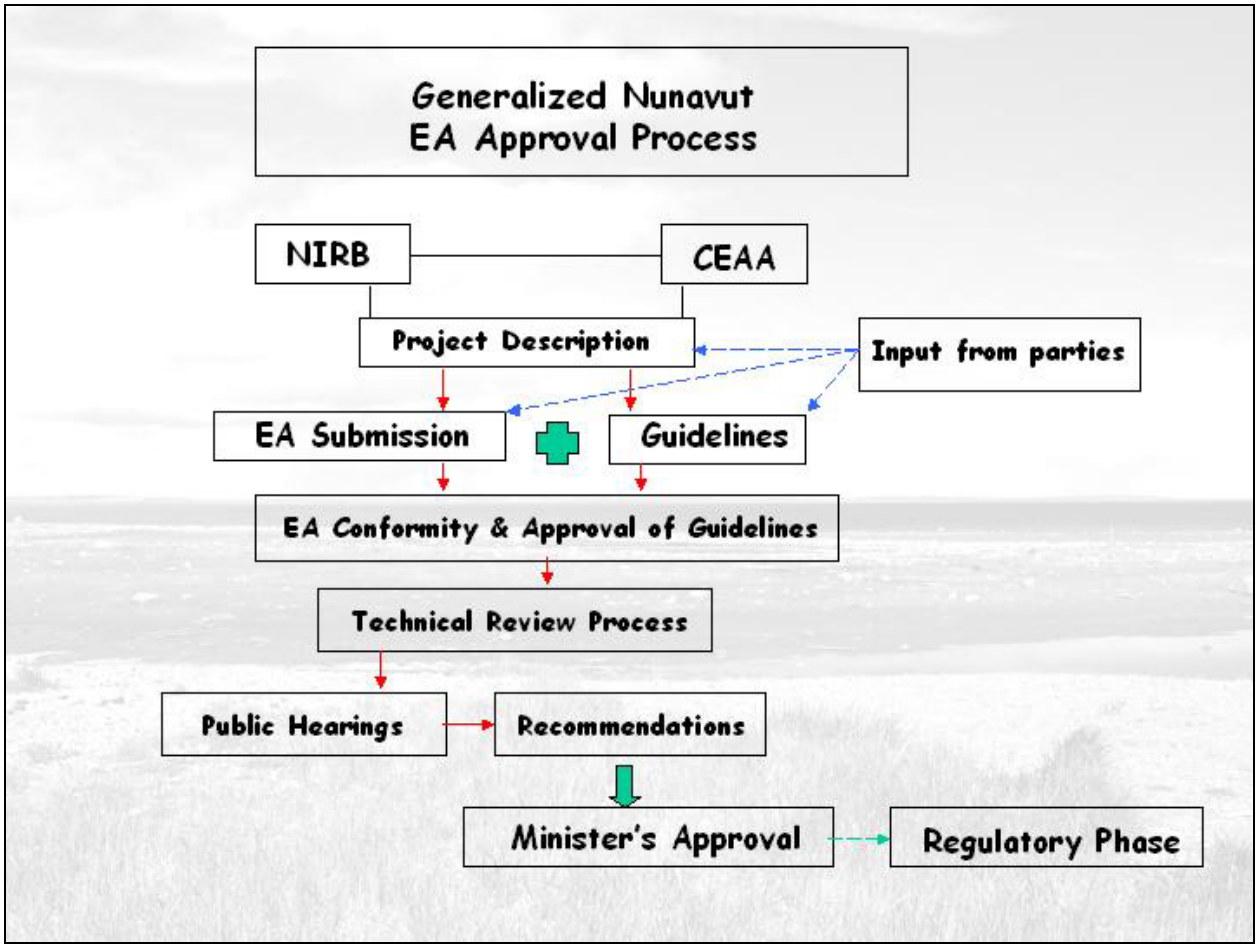
The Project will undergo an environmental review with the Nunavut Impact Review Board ("NIRB") as the Board has principal jurisdiction over the project (commissioner's and municipal land and off-shore). NIRB will undertake a project screening, prepare EIS Guidelines, and, subject to the approval of the project, issue a Project Certificate pursuant to the Nunavut Land Claims Agreement ("NLCA") Article 12, Part 5. NIRB will play a key leadership role in the assessment and approval of this project.

As the Nunavut Planning Commission ("NPC") has no approved plan in the area, the NIRB Project screening and review would likely be done at the request of the Government of Nunavut. NIRB would report its findings on any potential impacts to the Minister of the Department of Indian Affairs and Northern Development ("DIAND") and the need for a review by NIRB (12.5) or a Federal Panel (12.6).

The Project will also require a review under the Canadian Environmental Assessment Agency ("CEAA"), due to the triggering of federal statutes that are for the approval of this project.

A summary of the environmental assessment process in Nunavut is shown in Figure 7 below.

Figure 7- Generalized NIRB Process



6.2 Regulatory Approvals

As the port project will be developed on Commissioner's Land, a *Commissioner's Land Lease* will be required from the Department of Community and Government Services ("CG&S") of the Government of Nunavut ("GN").

If any quarrying were to occur outside of municipal land ('hinterland'), appropriate quarrying permits would be needed from CG&S. Any other land activities of short duration would also require a land use permit from CG&S. The department would submit any land use permits and/ or quarry applications to the Nunavut Impact Review Board for environmental screening. If land based activity is required on federal crown land to support the development of the port project, federal land use approvals would be required through the Department of Indian and Northern Affairs (INAC).

Authorizations will also be required from the GN in regards to health and safety and employment standards.

The Project's development of a dock and associated activities in the marine environment will require a fisheries authorization from Fisheries and Oceans Canada ("DFO"), under section 35 of the *Fisheries Act*. This authorization allows for alteration of fish habitat with associated fisheries habitat compensation being required, depending on the type of activity. It is anticipated there will not be the requirement for a water license under the Nunavut Waters and Nunavut Surface Rights Tribunal Act, as there are no anticipated impacts on receiving fresh water as a result of this project.

Approval will be needed from Transport Canada ("TC") for the Project's construction and operation within navigable waters pursuant to the *Navigable Waters Protection Act.* Any shipping activities would be regulated under the *Canada Marine Act.*

Environment Canada's ("EC") legislations concerning the management of storage tanks will also need to be considered by the project proponent.

The Proponent will have to follow regulations under the *Species at Risk Act ("SARA")* in regards to the species at risk in the area: the Harlequin Duck, the Peregrine falcon, the Beluga whale, the Northern Wolfish, the Spotted Wolfish and Atlantic Wolfish. The *Migratory Birds Convention Act* will also need to be considered, along with its regulations for migratory birds and destruction of habitat.

There are a number of other approvals required such as scientific permits from the Nunavut Research Institute ("NRI") to conduct environmental and socio-economic baseline and monitoring activities.

Clearly the application package required to support the Iqaluit Port Project will have to be comprehensive given the number of authorities required to move this project forward. A transparent and highly consultative approach will be used at all stages to ensure that approval agencies receive sufficient information to move this project forward in an effective manner.

7. Project Planning – Phases of Development and Funding Requirements

The planning phases outlined below are intended to provide general guidance and timing for the overall project. The overall port development and related infrastructure costs are estimated to be in the order of $47 million (Canadian). These costs are preliminary and are based on a general understanding of the proposed port facility. The refinement of these costs will occur as the engineering, permitting requirements and overall project design with ancillary infrastructure is at a more advanced stage. Funding for this project should occur in stages to correspond with the Project Planning Phases, which allows for

effective cash management and gives maximum flexibility as port concepts evolve. The following is an overview of the funding phases required for this project.

1. *Initial Project Planning/Scoping*

This project phase is currently underway. During the winter and spring of 2005, stakeholder workshops with the Iqaluit Port Steering Committee have been held to determine local objectives needs, project visioning and to develop an overall strategy in moving this project forward. This phase should also include preliminary environmental and socio-economic baseline information.

2. *Consultation*

Consultation with the project Steering Committee, government departments and boards, communities and the general public will occur throughout the life of this project.

3. *Integrated Port Plan and Feasibility Engineering*

This phase of the project will use the visioning and stakeholder concepts to develop the Integrated Port Plan including feasibility level engineering. This will be used to refine overall project costs and to refine the assessment and approvals strategy including associated baseline information collection and community consultation.

4. *Baseline Programs*

There will be a requirement to carry out engineering, environmental, socio-economic and IQ baseline programs in 2006 as follow up to the reconnaissance baseline programs outlined in Phase 1 above. It is an advantage to have 2 complete field seasons of field data from break-up until freeze-up to ensure the range of environmental conditions are included in the data set for the approvals process.

5. *Final Engineering and Project Design*

Final engineering and project design will be required prior to submitting regulatory applications. Refinement of the project will occur after receiving comments on the preliminary project design from stakeholders and will be done in concert with the results of the above baseline programs.

6. *Environmental Assessment and Regulatory Approvals*

An integrated regulatory application package including the environmental assessment document will be submitted once a final project design is complete to ensure the project base case does not change throughout the assessment and approval process.

7. *Construction*

It is estimated that 2 construction seasons will be required to complete the Iqaluit Port Project. Construction will not be initiated until all required government and board approvals are in place.

8. *Operation and Monitoring*

It is expected that operation of the facility and post construction monitoring will occur sometime after 2009.

The schedule for the planning phases, and the generalized pro forma funding schedule is presented in Table 12 below.

Table 12. Preliminary Project Schedule – Iqaluit Port Project

Major Activities	*2005*	*2006*				*2007*				*2008*				*2009*			
	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
1. Initial Project Planning/Scoping																	
2. Consultation																	
3. Integrated Port Plan and Feasibility Engineering																	
4. Baseline Programs																	
5. Final Engineering and Project Design																	
6. Environmental Assessment and Regulatory Approvals																	
7. Construction																	
8. Operation and Monitoring								PREP. ONLY									
Generalized Pro Forma Funding Schedule*	$ 35K	$ 35K	$352K	$916K	$780K	$ 670K	$435K	$390K	$920K	$ 630K	$ 635K	$ 11.16M	$6.51M	$5.21M	$3.02M	$5.01M	$3.01M

8. Community Consultation

8.1 Approach

The primary approach to community consultation is based on the decision by the City of Iqaluit at the commencement of the planning project, as the lead organization co-ordinating the Integrated Port Project planning, to form a Steering Committee which has subsequently grown into a larger Stakeholders Group. The Stakeholders Group provides a vehicle for the direct participation of all interested parties in the project direction and planning. The Stakeholders Group serves as a primary mechanism for input of information, concerns and support from the community, as well as for the dissemination of information and reports to all interested parties within the community.

Two major meetings of the Stakeholders Group have been held to date, in February and May of 2005. These included representatives of the City, key user groups for the port facilities, appropriate agencies of the Government of Nunavut, local representatives of the Department of Fisheries and Oceans, economic planning bodies based in Nunavut, Nunavut Tunngavik Inc. as the key organization overseeing implementation of the land claim, the Hunters and Trappers Association representing hunters and fishers involved in traditional harvesting pursuits, and the Iqaluit Chamber of Commerce representing business interests within the City. The objective is to continue to expand participation in the Stakeholders Group to additional representatives of user groups and other local representatives of government departments as the project planning unfolds.

Stakeholder consultations to date have been the basis for the definition of the vision, concept and project description for the integrated port project. The consulting team has complemented this with ongoing research and technical support.

The activities of the Stakeholders Group will be complemented by information and consultation sessions designed for the broader community of Iqaluit, and for other communities in Nunavut that will be impacted through construction and operation of the integrated port facilities.

8.2 Consultation Phases

Phases for community consultation will correspond to key project phases outlined above in section 7:

Initial Project Planning/Scoping (October 2005 – March 2006)

- Stakeholders Group: discussion and feedback of initial concept and project description through at least two Stakeholder meetings/workshops;
- Community: information provided to community members through newsletter and radio, and feedback, concerns and support obtained through a general community information meeting;
- Other impacted communities: initial written information to be provided, and meetings to be held with representatives of other communities.

Engineering and Baseline Programs (April 2006 – September 2007)

- Development and sharing of baseline workplans with Stakeholder groups and communities;
- Stakeholder Group: ongoing reporting and input through scheduled meetings/workshops to provide information as design progresses, and to ensure that community objectives and interests continue to lead and provide a framework for project design;
- Community and other impacted communities: baseline programs, conducted over two summer seasons, will include detailed research through surveys, interviews, focus groups and other means covering current past and current use by all user groups, and all other environmental, socio-economic aspects and cultural aspects related to the project, including project objectives and description, land and resource use, archaeological areas, terrain sensitivities, Inuit cultural objectives and concerns, Inuit, city resident, and Nunavut employment and business contracting participation, etc.

Environmental Assessment and Regulatory Approvals (October 2006 – June 2007)

- Stakeholders Group: the stakeholders will be directly involved in providing input into the environmental assessment process and regulatory approvals process;
- Community: during the environmental assessment, efforts will be directed at ensuring that all community members have sufficient knowledge of and opportunity to participate in the assessment process.

Construction (July – December 2008)

- Stakeholder Group: during the initial stages of construction, the Stakeholders will act as a conduit for monitoring and communication of any community concerns during the construction process.

9. Approach and Scope of Environmental and Socio-Economic Baseline Programs

A number of environmental and socio-economic baseline studies will need to be carried out to ensure there is adequate information to properly assess the short term (e.g. construction) and longer term (e.g. operations) impacts of the Iqaluit Port Project.

The following are examples of baseline programs that will need to be carried out over at least 2 field seasons in support of the assessment and approval of the port project.

Example Physical Baseline Programs:

- Fall/Winter/Spring Ice conditions;
- Near shore marine conditions including detailed bathymetry, distribution and thickness of bottom sediments;
- Inter-tidal assessment;
- Sea level dynamics, including coastal erosion and storm events;
- Climate change-long term impact on sea-ice formation and break up;
- Geotechnical drilling (both sediment and bedrock); and,
- Permafrost considerations.

Example Biological Baseline Programs:

- Fish presence/abundance;
- Fish habitat characterization (also required for compensation requirements);
- Marine mammal presence/abundance;
- Inventory of threatened or endangered species (birds, mammals, fish); and,
- Inter-tidal assessment.

The approach that will be used for the development of baseline programs will be to develop and share workplans with the port stakeholder committee, boards, government and the general public prior to initiation of these programs. Of particular importance will be the integration of *Inuit qaujimajatuqangit* into baseline programs and the linkages between this knowledge and western science.

The Iqaluit Port Project will require services and employees that are resident in Iqaluit to support baseline programs through institutions such as Arctic College. In this context training will be a significant component of the collection of environmental, engineering and socio-economic baseline information.

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The following issues would need to be considered for any social, economic and cultural studies:

- Identification of communities to be impacted in the Baffin region;
- Current need for project;
- Predicted economic benefits of the Project;
- Predicted negative impacts from the Project;
- Assessment of cultural values;
- Archeological studies; and
- The incorporation of Inuit Qaujimajatuqangit ("IQ") (traditional knowledge).

10. Intergovernmental Oversight Committee

It is recognized that in order to realize the ambitious objectives of this Strategic Plan for the Iqaluit Deepwater Port Project, the active cooperation and participation of all three levels of government will be required. It is recommended therefore, that an Intergovernmental Oversight Committee be formed, under the leadership of the City, including representatives of the three levels of government and Nunavut Tunngavik Inc.

Membership of the Intergovernment Oversight Committee would include:

Federal Government:
The Department of Indian Affairs and Northern Development should play a lead role as the agency with overall responsibility for development in the Arctic. Nevertheless, there are other key federal players as well, including the Department of Fisheries and Oceans in conjunction with the Canadian Coast Guard Service and the Department of Transport.

Territorial Government:
There are also several departments with direct interest in the construction and operation of marine facilities, perhaps led by the Department of Intergovernmental Affairs, but including the Departments of Economic Development and Transportation, Environment and Community Government and Services.

Municipal Government:
There should be a combination of Councillors, led by the Mayor and supported by senior officials, and also including two or three key representatives from the broader community. The City would provide leadership of the Oversight Committee.

Nunavut Tunngavik Inc.:
Although not a governmental group, because of their integral role in the creation of Nunavut and representational function played on behalf of the Inuit, Nunavut Tunngavik Inc. should also play a role in the oversight committee.

An early decision should be taken as to how this committee will be formally structured including members and alternates, its broad responsibilities and how information will be shared and developed as the project proceeds. It should be this Committee that ensures a close level of coordination between all interested parties and determines the specific and unique roles that each of the parties will play in realizing the vision of an Integrated Port. The Committee should meet at least quarterly throughout each stage of development outlined earlier in this plan, and detailed public reports, approved by the Committee, should be issued at least semi-annually. In this way accountabilities will be established and effective communication between all interested parties assured.

During the Stakeholder workshops, a preferred option for initial management of the Integrated Port Facility was identified. This option would involve a tripartite management structure involving all three levels of government. It was suggested that this initial management structure would be appropriate during the formative operational stages, and might later be replaced by a public/private or independent port authority once management and operational patterns and procedures have become established. While further planning on management structure for the proposal Integrated Port will be carried out, it is envisioned that the formation and work of the Oversight Committee would provide an appropriate means for planning and establishing an initial tripartite management body.

11. Conclusions

In this study an examination has been conducted of various factors that must be considered before a deepwater port facility at Iqaluit can be constructed and it has been determined that such an endeavour is indeed both technically feasible and economically desirable. Preliminary estimates of costs for each of the phases necessary to bring the construction of port facilities to fruition have been identified and range of cost benefits also initially assessed. To complete this project, considerable effort will be required and it will take time. Perhaps the most ambitious estimate for completion of this project is four years, but more realistically five years from this point before the first ship could be berthed at the new wharf .

This report notes that there are a number of options available with respect to the type of marine structure for the berth itself. Nevertheless, in order to develop some preliminary cost estimates it was necessary to

choose one of these and a caisson structure has been proposed as a viable option. Notwithstanding this initial choice, more cost effective designs may be presented at future stages of project development.

A significant feature of the planning stage must be completion of a broad range of environmental and socio-economic impact studies. Once these studies have been completed and all of the regulatory requirements have been satisfied and engineering and design work completed, at least two full seasons is estimated as being necessary for the actual construction of this type of facility

As identified in the earlier stakeholder workshops, the notion of an integrated port facility has also been shown as the most logical way of proceeding rather than considering the establishment of facilities designed to serve only one or two marine user groups. The length of the shipping season in Frobisher Bay is short and in order to maximize the potential benefits of a deepwater port, a wide group of users must be considered. Since 1992, the shipping season has been extended from as early as June 30th to as late as November 28th just one day short of five months.[10] While falling far short of year-round access this is still a significant period for active marine activity in the arctic.

The broad vision for Deepwater Port Facilities in Iqaluit is to provide marine support services for the benefit of the residents of Iqaluit and for Nunavummiut at large in a manner that protects marine assets and supports a variety of users.

Potential user groups include those involved in dry cargo handling including provision of construction materials, petroleum re-supply, support for the minerals industry, fisheries, tourist cruise ship operations, Coast Guard, military and research vessels as well as small craft users including hunters and fishermen, local tourism outfitters, and small cargo operators. Two separate but linked facilities are included in the integrated plan – a berthing area for large vessels and a small craft harbour area.

The benefits will include a significant decrease in off-loading times for cargo ships resulting in considerable cost savings; opportunities for cruse ship arrivals and departures facilitating passenger changes and resulting in significant economic spin-offs for Iqaluit; and opportunities for vessels engaged in the off-shore fishery to use the port facilities to refuel and re-supply and offload product for transshipment to international destinations. Crew changes will also be possible in all cases thus realizing additional benefits to the local Iqaluit economy. The facilities available for smaller craft will assure much safer and more efficient means for local owners and passengers to use these classes of vessels. Equally important will be a dramatic reduction in environmental risk in transferring fuel products as well as an overall reduced impact on the inter-tidal zone with the cessation of current off-loading procedures.

It is proposed that the project schedule be developed in 8 distinct phases including: initial project planning/scoping; consultation; integrated port plan and feasibility engineering; baseline socio-economic and environmental programs; final engineering and project design; environmental assessment and

[10] Although the full shipping season is five months duration, to be conservative in forecasting usage, we have focused only on the period of most active shipping, which is approximately ninety-eight days. The duration of this most active period may well expand with the availability of a deepwater port.

regulatory approvals; construction and finally operation and monitoring. While some of the preliminary work has commenced this year, it is estimated that the remainder of Phase 1 and the other phases will take a minimum of an additional four years for completion.

Estimated capital and operating costs for the integrated port facilities are shown in the table below. Note that all estimated costs are order of magnitude estimates only and will be refined at the final engineering stage.

Table 13. Iqaluit Integrated Port Facilities:
Summary of Estimated Capital and Operating Costs

Deepwater Berth	$32,060,000
Deepwater Berth Equipment	$ 2,475,000
Deepwater Berth - Base Capital Cost	***$34,535,000***
Small Craft Harbour - Base Capital Cost	***$ 2,423,000***
Integrated Port Base Capital Cost Estimate	***$36,958,000***
Total Capital Cost Estimate, incuding engineering, approvals and contingency	**$49,228,056**
Annual Operating Cost Estimate	**$ 2,146,413**

The most immediate requirement is the identification of funding sources to complete the preliminary work and to begin the regulatory and engineering planning process. Since the federal government is always involved in the installation of saltwater port facilities, various federal departments are seen as the primary source of required planning and capital funding, but the full and active cooperation and involvement of both territorial and municipal governments will also be required. This support will include the marshalling of existing resources to help facilitate the development.

At all stages the public must be kept fully informed and indeed play an active role in the entire process thus ensuring appropriate input at each stage and a full understanding of the planning, construction and operational processes.

Appendices

APPENDIX A

STEERING COMMITTEE WORKSHOP NOTES

FEBRUARY 16, 2005

Iqaluit Integrated Deepwater Port Plan

Stakeholder Planning Workshop
Iqaluit, Nunavut, May 26, 2005

Workshop Notes

1. Introduction

The City of Iqaluit is spearheading the development of a plan for establishment of deepwater port facilities at Iqaluit. The intent of this planning project is to produce an *Integrated Port Facilities Plan* that will meet the long-term needs of Iqaluit for sealift and handling of other large vessels and at the same time provide facilities to address the needs of local commercial and other small and mid-size craft operators.

An essential foundation for pursuing this plan is the establishment of an active stakeholders group representing current and potential users of the proposed new integrated port facilities. It is critical to the success of the project that stakeholders participate fully in all stages of the planning.

An initial meeting of Stakeholders was organized by the City and held in Iqaluit on February 16th, 2005. At that meeting there was discussion of the various groups that use the current Iqaluit harbour, and a presentation by the consulting team on environmental, socio-economic, engineering and regulatory considerations. The key point agreed upon by stakeholders at the initial meeting was that the planning must addresses the needs of all users. Planned facilities must serve not only large vessels, but also the mid-size and smaller vessels that use the harbour and are an essential element of the economy and future growth of Iqaluit and Nunavut. Final port concepts must meet local objectives for users in Iqaluit and at the same time provides benefits to all of Nunavut.

The second meeting of Stakeholders was held in Iqaluit on May 26th, 2005. This meeting included an expanded Stakeholder group representing:

- City of Iqaluit
- Government of Nunavut, Legislative Assembly
- Government of Nunavut, Department of Environment
- Government of Nunavut, Department of Community Government and Services
- Amarok Hunters and Trappers Association
- Baffin Fisheries Coalition
- Qikiqtaaluk Corporation
- Local Cargo Hauling
- Nunavut Eastern Arctic Shipping (NEAS)

- Nunavut Sealink and Supply Inc. (NSSI)
- Uqsuq Oil
- Iqaluit Chamber of Commerce
- Nunavut Economic Forum
- Nunavut Tungavik Inc.
- Government of Canada, Department of Fisheries and Oceans

A list of participants is provided in Appendix 1.

Opening comments at the May 26th workshop were made by both Mayor Elisapee Sheutiapik and Deputy Mayor Glen Williams. City representatives noted that the City has obtained resources to hire a consulting team under Aarluk Consulting and Gartner Lee Limited to work on initial project research and to bring together the various Stakeholders to identify the opportunities and challenges in achieving the goal of establishing integrated port facilities. Objectives for the workshop were:

1. To ensure that stakeholders have a common understanding of circumstances and factors affecting marine activity in Frobisher Bay, specifically with respect to:
   - Current status of marine vessel activity and results of research and special studies undertaken in recent years. (1980-2005)
   - Growth of types of marine vessel traffic in Frobisher Bay over the past several years
   - Environmental and Regulatory considerations concerning construction and operation of Deepwater Port facilities

2. To identify user group needs in relation to the establishment of an Iqaluit Deepwater Port:
   - Medium to Long Term potential of marine vessel activity with or without a Deepwater Port Facility
   - Opportunities and Challenges impacting on the establishment of Deepwater Port Facilities in Iqaluit

3. To Explore and Identify Basic Concepts and Options to meet Local Objectives of a Deepwater Port.

4. To develop a Vison and Planning Framework for the establishment and operation of a Deepwater Port facility in Iqaluit.

5. To understand the scope of work and steps which must be undertaken and completed in order to realize the Port Vision.

A complete statement of objectives and the agenda for the workshop are provided in Appendix 2.

The workshop was facilitated by the consulting team – Terry Forth and Fred Weihs of Aarluk Consulting, and Steve Morison and Chris Anderson of Gartner Lee Limited. During the morning session, the consulting team presented the results of research to date, and a summary of engineering and environmental considerations. In the afternoon session, detailed discussions

were held among the stakeholder representatives on their current situation. potential for development, and the specific needs of each group in relation to integrated port facilities. The participants also developed a draft Vision Statement for development of integrated port facilities, and identified next steps required to pursue the project. The results of these discussions are presented in the notes below.

2. User Groups: Current Situation and Potential

a) General Cargo Shipping

Current Situation

Number of shipments:

- Initial data on shipping to Iqaluit was obtained from the Canadian Coast Guard for the 12-year period 1992-2003;
- Over the entire period 1992-2003, there were 150 vessels landing general cargo in Iqaluit, or an average of 13 shipments annually;
- From 1992-1997, there were 8 shipments on average annually, and from 1998-2003 the average number of shipments doubled to 16 annually;
- One of the larger cargo ships currently in use is 361 feet in length and has a minimum draught of 25 feet;
- There were also 9 shipments of general cargo by tug and barge over the period, with 8 of these occurring between 1999 and 2003.

Shipping season:

- Over the 12-year period, the earliest general cargo shipment arrived in Iqaluit June 30th;
- Last shipment left Iqaluit November 17th.

Unloading times and costs:

- Over the 12-year period, general cargo vessels spent an average of 4.3 days in harbour;
- In 2003, the days spent in harbour by general cargo vessels ranged from 1 day to 14 days;
- Currently, sealift is a tidal operation which involves handling of cargo up to four times, and there is significant damage during transfer by barge in rough water;
- The number of times goods are handled adds to the overall cost of shipping, since the risk of damage is estimated for each time goods are handled and taken into account in crating,
- The number of days in harbour represents direct costs to shipping company, which is passed on to consumers;
- The beach master system costs the federal government about $300,000 per year; currently there is no system for cost recovery;
- There is some uncertainty whether the Canadian Coast Guard will continue to operate the beach master service.

Nature of the sealift:

- Previously, standard sealift packaging was in 2.5 cubic metre crates of approximately 100 kilos each;
- In recent years, package size of sealift goods has been decreasing, with an increasing number of complaints related to problems of consolidation and getting delivery of smaller packages;
- This has resulted in a strong trend to containerization of cargo and use of larger ships.

Transshipment:

- Transshipment of cargo on to other communities is already occurring through Iqaluit;
- Current transshipment volumes are low, but increasing.

Potential

- In the future, carriers will move increasingly to accepting small packages and containerizing shipments, with shipments going to a redistribution centre for distribution to customers;
- This will allow vessels to move to more secure facilities, and will reduce handling and damage;
- Containerization will result in reduced shipping costs.
- There is also great potential for increased transshipment, however the required infrastructure in not currently in place

b) Petroleum

Current Situation

Number of shipments and volumes:

- Coast Guard data on petroleum shipments shows that there were 53 tankers delivering petroleum products to Iqaluit from 1992 to 2003, an average of 4 tankers per year;
- Number of tankers has remained fairly constant over the years, but size of shipments are increasing;
- Volume of fuel delivered in 2004 was 47.7 million litres;
- Projected volume of fuel to be delivered in 2005 is 70.0 million litres.

Shipping season:

- Over the 12-year period, earliest petroleum shipment arrived in Iqaluit June 26th;
- Last shipment left Iqaluit November 28th.

Unloading times:

- Over the 12-year period 1992-2003, average days spent in the Iqaluit harbour were 3.8 days;
- In 2003, days spent in harbour ranged from 3 days to 5 days.

Current issues:

- The major problem facing petroleum shipments is accessibility;
- Until a couple of years ago, the sealift season for petroleum was 6 to 8 weeks in duration;
- Now the sealift season lasts from the end of June right up to the end of November, a period of 5 months;
- The increase in the shipping season has created increased risk;
- By November, the sealift is operating with ice present and in 20 hours of darkness, coupled with an increased likelihood of high winds and otherwise stormy weather;
- At this time of year, it is not possible to get to the ship unloading location any more by water, and it is no longer possible to adequately patrol the ship to shore pipeline or the onshore pipeline;
- A single 1000 to 1500 foot floating hose line is used, which can be a navigation hazard;
- Onshore, there is a single 10 inch line;
- An air plug is used to separate the petroleum products;
- The work at this time of year is very risky for workers, and they have no shelter from the weather;
- Once the ship is hooked up to the shore manifold, the whole operation becomes the responsibility of the terminal;
- If a problem (i.e. a leakage or spill) did occur, it becomes an issue of accessibility and of safety;
- Right now, the spill contingency plan only applies to the land; there is no spill contingency plan applicable to the ship to shore operation;
- All of these factors mean that it is a very high risk operation;
- There is a clear environmental risk in transferring fuel in later fall/early winter that is not adequately covered in current spill contingency plans; to date there have no incidents in regards to fuel transfer however the risk remains high with the current method of fuel transfer.

Potential

- The potential for increased sales of petroleum products through Iqaluit is very great;
- This includes bunkering (refueling) of ships in the area and fuel deliveries to other projects (e.g. mining sites);
- The capacity is present in Iqaluit to hold fuel for meeting the needs of a variety of customers outside the direct needs of the city;
- Fishing vessels, cruise ships, exploration company vessels, military vessels in the area all require refueling;
- However, the demand for vessel refueling either cannot be met with current facilities, or can only be met at very high risk;
- Many vessels won't come into the Iqaluit harbour because they can't take on fuel there given current facilities;
- Refueling of vessels requires a safe docking facility with hydraulic arms;
- The environmental risk associated with fuel transfer is more easily managed in a port facility.

c) Small Cargo Vessels and Other Small Craft

Current Situation

- Small craft (less than 10 m in length) are the most frequent users of the harbour, and many of the operators are hunters, along with small and mid-size cargo or tourism operators;
- A boat and motor is the largest capital expenditure required for any hunter;
- However, there is little data currently available on use of the Iqaluit harbour by small and mid-size vessels;
- The Government of Nunavut is planning a survey to look at small craft use in communities, but the current survey will not include Iqaluit;
- Insurance for small craft is very expensive and often unaffordable; the high cost of insurance is directly related to the lack of infrastructure in Iqaluit;
- Currently, refueling of smaller boats is a high risk procedure: there is no proper fuel truck access and fuel is transferred from oil drums;
- A lot of vessels want to come to Iqaluit to refuel, but can't because of lack of facilities;
- There is no designated area and no facilities for storage of smaller boats, which are currently just pulled up on the shore in a very crowded area, resulting in significant damage to the boats from snow removal, snowmobile traffic, etc.;
- The current breakwater does not provide adequate protection:
    - Leaving, landing, loading and unloading of small craft at the breakwater can be done only during 1 to 2 hour period every 12 hours at high tide;
    - There is no sheltered anchoring available in the water all of the time, since the area protected by the breakwater is dry for much of the tide cycle.

d) Fishery

Current Situation

Number of fishing vessels and shipping season:

- Over the 12-year period 1992-2003, only 11 fishing vessels have visited the Iqaluit harbour, an average of about 1 per year;
- The earliest visit by a fishing vessel over the 12-year period was July 29th, and the latest departure of a fishing vessel was November 13th.

Current fishing operations:

- There are three classes of fishing boats –30-64 feet, 65 to 99 feet, and over 100 feet;
- Currently there are 5 vessels operating in the area near Iqaluit that are fishing for turbot;
- The turbot season last from mid-May to December.
- There are 17 offshore shrimp licences in the area, with 152,000 metric tones of quota;
- Currently there are 14 vessels fishing for shrimp, with 15 to be operating next year;
- Shrimp vessels are from 48 m to 63 m in length;
- Shrimp fishing is a year round activity, starting in January in Newfoundland, reaching Baffin in late June and operating in the area until December;

- The vessels hold up to 500 metric tones of product;
- 99% of the fishery products are sold outside of Canada (Europe, Asia, etc.);
- Fishing vessels require port facilities to unload and transship product, cold storage facilities, and services for food, fuel, oil, and crew changes;
- There needs to be increased access for Nunavut to the fishery: current access and allocation arrangements discriminate against Nunavut, which is the only coastal jurisdiction in Canada that does not have access to the majority of its adjacent fish resources;
- Infrastructure is required to enable Nunavut to land and process its own fish resources;
- Nunavut has been excluded when the federal government has made major marine infrastructure investments for harbours, ports, service centres, processing plants and cold-storage facilities;
- There are no facilities in Baffin to properly accommodate fishing vessels: currently, vessels leave the Baffin area and go to Nuuk or St. Anthony land their catch, resupply and refuel, and then head back up to the Baffin area to fish again, which is an expensive method of operating for the fishing companies;

Potential

- Construction of port facilities in Iqaluit would change the economics of the whole picture, making Iqaluit an economic option for loading, offloading, trans-shipment, refueling, etc. of offshore fishing vessels;
- Iqaluit could service fishing vessels in the area from July to November if the required port facilities were available;
- Port facilities in Iqaluit would also help development of inshore fisheries in other communities: fish could be stored in smaller communities in containers, moved to Iqaluit, and then transferred to reefer boats;
- This could help to obtain increased fishery allocations;
- A port facility would provide essential support to the inshore fishery;
- All fish caught off Newfoundland have to be shipped through Newfoundland; this policy can't be implemented in Nunavut currently, because required port facilities do not exist, resulting in a huge economic loss to Nunavut;
- There is a need to get much higher quota allocations: there are no quotas available now around Iqaluit, but they are available around Qikiqtarjuaq, Clyde River, and Pond Inlet;
- If facilities were available, quotas could be fished by Nunavummiut through the inshore fishery.

e) Tourism

Current Situation

- Over the 12-year period from 1992-2003, 6 cruise ships have visited Iqaluit;
- Most cruise ships currently bypass Iqaluit because suitable refueling and resupply facilities are not available;

- Transfer of passenger to shore and back to ship is currently an awkward and sometimes risky operation;
- Cruise ships now refuel directly from a tanker;
- Lack of facilities limits services provided to tourists from smaller tourism operators: tides suitable for loading clients into boats in the morning are available only every 2nd week.

Potential

- There is great potential for tourism development if marine facilities were developed;
- This would double the time smaller tourism operators could be providing services to clients;
- Mid-size passenger boats could be chartered by local tourism operators;
- Large cruise ships would have a convenient port for refueling, resupply, and exchange of passengers.

f) Coast Guard and Military Vessels

Current Situation

- Over the 12-year period from 1992-2003, 72 Coast Guard icebreakers have operated around the Iqaluit harbour, an average of 6 per year;
- Over the 12-year period, only 3 other Coast Guard or military vessels have visited Iqaluit;
- The earliest arrival of a Coast Guard or military vessel over the 12 years was June 26th, and the latest departure was November 15th.
- The resupply and refueling of the military vessels is a high risk operation.

Potential

- There should be increased activity by military vessels in the future related to considerations of sovereignty;
- There should also be increased activity of research vessels related to research in climate change, etc.

3. Engineering and Environmental Considerations

1980 Engineering Study:

- The 1980 preliminary engineering study prepared by Public Works identified Inuit Head as the preferred location;
- The engineering study looked at construction of a deep sea port, with a 77 metre concrete caisson wharf connected by a causeway to an open storage area, a transit shed, and an 1.6 kg roadway for access;
- Alternative construction methods considered for the wharf included steel sheet pile bulkhead, timber crib, and floating platform;
- The port would operate late June to November;

- The engineering report noted that construction would required dredging (48,000 cubic metres), and blasting of rock.

Environmental considerations:

- The environmental impact of dredging must be considered: could the proposed causeway be put out further to reduce or eliminate dredging?
- On the other hand, dredged materials could be used to extend existing small boat breakwater;
- The cost of dredging versus extending the causeway farther will have to be considered, and DFO will be looking at the environmental impact of dredging as part of the environmental assessment;
- DFO is pleased to be involved at the start of the planning process for the integrated port facility, and would like to be involved in all phases, particularly during the design stage;
- Concerns were expressed about the use of explosives in the water, the time of year this might be done, and the resulting impact on marine life;
- The potential use of explosives will have to be considered during the environmental assessment;
- If explosives were to be used, advice would be sought from the HTO on when and how to blast in order to minimize the impact on marine life;
- It appears that the route proposed for the access road does not impact on areas of existing grave sites; however, the route of an access road needs to be examined in more detail;
- Options for the road to span the existing gap (construction of a bridge versus in-filling of the gap) need to be examined in terms of cost, impact on marine life, and impact on boating routes and operations (existing gap provides sheltered passage for smaller vessels in rough weather);
- Under the Fisheries Act, there is a requirement for compensation for damage to fish habitat: if a portion of fish habitat is negatively impacted by port construction, equivalent new habitat has to be created elsewhere;
- Guidelines on fish habitat compensation can be obtained from DFO;
- If compensation for the alteration of fish habitat is required for the port project, it would be useful to look at the option of building up the habitat in the Sylvia Grinnell River, which is an important char river for the community of Iqaluit;
- Members of the HTO are very concerned about the transfer of petroleum from tankers that arrive in October and November: there is a high risk of spills, given the heavy winds and rough water in October/November, and this would be a very serious situation if a spill did occur.

6. Needs of Users in Relation to Integrated Port Facilities

Dry Cargo

The needs of users shipping general cargo to Iqaluit in relation to integrated port facilities include:

- Vessels to be able to move to a secure facility for off-loading;
- Reduced time for discharging cargo;
- Safer environment for unloading cargo;
- Reduced number of handlings for cargo, which will reduce crating costs as well as handling costs;
- Facilities to handle containerization and redistribution of cargo, that will handle smaller lots of goods;
- One or two berths for vessels, depending on the number and volume of cargo shipments, and the ability to adequately schedule shipments.

Petroleum

The needs of users shipping and receiving petroleum include:

- A safe dock for transfer of petroleum, with a hydraulic oil transfer arm, and direct access to the pipeline;
- Implementation of best practices for the transfer to petroleum from tankers to shore facilities, and for bunkering (refueling) of vessels.

Small Craft/Cargo

The needs of users with small craft and mid-size vessels, including hunters, mid-size cargo vessel operators and tourism operators, include:

- Safe, protected anchorage in the harbour;
- A place to gain access to boats throughout the whole tide cycle;
  - Possibly a floating dock and access ramp for small and mid-sized vessels;
  - A slip to put larger boats in and out of the water;
  - Fixed point to unload fish to dock level by crane;
  - Vehicle access to the wharf;
- Facilities for safe resupply and refueling (gasoline and diesel), accessible at any tide;
- Permanent fueling facility (gas bar) to replace refueling from truck and drum, for both gas and diesel;
- An area to haul out for maintenance and safe storage: possibly a slip with a trolley for facilitating removal of boats, and an area for safe storage linked by the trolley;
- What about cost of fees for use of dock versus current no cost for anchoring;
- A protected area for anchorage with water present all the time: possibly extend the existing breakwater to small island, or construct an additional breakwater.

Fishery

The needs of users involved in offshore and inshore fishery operations include:

- Port facilities for docking, and facilities for cold storage, refueling, resupply and crew change, and transshipment to market;
- Unloading of palletized fish for larger boats, buckets for small inshore vessels.

7. Vision Statement

The stakeholder representatives at the workshop prepared the following draft vision statement for development of the Iqaluit integrated port facilities:

> **The vision for the Iqaluit Deep Water Port Facilities is to provide services for the residents of Iqaluit and the region that are integrated for a variety of users to ensure safe and timely access, and that support the efficient shipping of goods using the best environmental practices, and to provide the infrastructure necessary to serve and promote industries such as tourism, commercial fishing, mineral exploration and traditional pursuits, while at the same time ensuring the protection of marine assets.**

5. Options for Management of Port

The stakeholder representatives identified the following options for management of the integrated port facilities. The management functions would encompass the port and harbour operations, beach master duties, and collection of user fees. Facilities would be required to accommodate Canada Customs operations. These management options are to be explored further in subsequent stages of the research and development of the integrated port plan.

1. Independent Port Authority
2. Local Board
3. City of Iqaluit
4. Transport Canada
5. Private enterprise
6. Phased approach to management, starting perhaps as a joint venture among the City of Iqaluit, the Government of Nunavut, and the Government of Canada, and evolving to private sector or port authority management arrangements.

8. Moving Forward

a) Directions and Sources for Further Research

1. Current and forecast traffic by all users:
   - Look at Port of Churchill for comparisons;
   - Conduct market survey to determine extent to which user groups will utilize integrated port facilities;

- Sources of information on fishing vessels:
  - Government of Nunavut Fisheries Strategy documents;
  - Look at number of vessels currently operating in the area that would come into Iqaluit for provisioning and repair if the infrastructure was there;
  - Fishing vessels are licensed by DFO; should be able to identify where the fishing vessels are going and why;
  - Fisheries Coalition is a source of information;
  - CMAC review should provide useful information: source is Peter Kanunan, Winnipeg
- Sources of information on tourism:
  - Sources for data on larger passenger ships are GN Dept. of Economic Development and Nunavut

2. Economic Development
   - In developing the integrated port concept and presenting it to government, it is essential to tie port planning to priorities for environmental protection and economic development.

3. Port Management
   - A major question for planning is who will manage the port facilities;
   - Investigation and research into this must be pursued actively.

4. Operating Costs and User Fees
   - Port will have to be self-sufficient in O&M;
   - Therefore, need to address ongoing O&M costs, and extent to which user fees are required;
   - Quantify efficiencies and benefits to existing users, compared to any additional user fees and costs;
   - Investigate option of having shipping fees go to local authority.

b) Next Steps

1. Obtaining Initial Support:

- Concept for integrated port facilities has widespread support from current City Council;
- Need to inform public of advantages to the community as a whole, and obtain further input on community needs, and input from Inuit Qaujimajatuqangit;
- Need to go to Assembly at next sitting and obtain support:
  - Each stakeholder group should write directly to the three MLAs, with a copy to the City, to obtain a letter of support;
- Will need to lobby in Ottawa for support and to identify potential sources of funding, based on preparation of a detailed business case document and proposal.

2. Preparation of Business Case:

- Need to build a comprehensive business case to provide information and obtain support of Government of Nunavut, Government of Canada, industry and other user groups, and public;
- The Business Case document will include:
  - Rationale for construction of integrated port facilities at Iqaluit;
  - Quantification and comparison of efficiencies and other benefits created by new facilities, and potential costs to users;
  - Proposal for phased funding related to port development schedule, addressing both public and private funding partnerships;
  - Overall cost and timing for planning, design, construction and operation of integrated port facilities;
  - Consideration of impact on environment, to be fully investigated through subsequent environmental assessment;
  - Analysis of feasibility.

Appendix 1: List of Stakeholder Representatives

Name	Organization
Mayor Elisapee Sheutiapik	City of Iqaluit
Deputy Mayor Glen Williams	City of Iqaluit, and local tour operator/outfitter
Kim Rizzi	City of Iqaluit – Economic Development Officer
Hunter Tootoo	MLA – Iqaluit Centre
Wayne Lynch	Dept. of Environment – GN Fisheries
Joshua Kango	Board Member –Amarok HTA
Sammy Josephie	Board Member –Amarok HTA
Sytukie Joamie	Secretary Manager –Amarok HTA
Peter Keenainak	Qikiqtaaluk Corporation
Russell Chislett	Owner/Operator – Soapstone Hauling
Archie Angnakak	NEAS - Iqaluit
Glenn Cousins	President, Iqaluit Chamber of Commerce, and Manager of Northmart Store
John Paton	Nunavut Sealink and Supply Inc. (NSSI)
Barry Cornthwaite	NSSI and Arctic Coops Ltd.
John Dawe	Community Government and Services, Government of Nunavut
Monica Ell	Director of Business Development, NTI; also representing the Nunavut Economic Forum
Scott Cooper	Uqsuq Oil
Andrejka Lokar	Fisheries and Oceans, Government of Canada
John Fast	Community and Government Services, Government of Nuanvut
David Alexander	Baffin Fisheries Coalition

Appendix 2: Workshop Objectives and Agenda

Iqaluit Deepwater Port, Stakeholder Workshop
Objectives for the Workshop

Overall Purpose:

Complete the Initial Phase 1 Planning for an Iqaluit Deepwater Port by the Stakeholder Group

Specific Workshop Objectives:

1. To ensure that stakeholders have a common understanding of circumstances and factors affecting marine activity in Frobisher Bay, specifically with respect to:

    - Current status of marine vessel activity and results of research and special studies undertaken in recent years. (1980-2005)

    - Growth of types of marine vessel traffic in Frobisher Bay over the past several years

    - Environmental and Regulatory considerations concerning construction and operation of Deepwater Port facilities

2. To identify user group needs in relation to the establishment of an Iqaluit Deepwater Port

    - Medium to Long Term potential of marine vessel activity with or without a Deepwater Port Facility

    - Opportunities and Challenges impacting on the establishment of Deepwater Port Facilities in Iqaluit

3. To Explore and Identify Basic Concepts and Options to meet Local Objectives of a Deepwater Port

4. To develop a Vison and Planning Framework for the establishment and operation of a Deepwater Port facility in Iqaluit.

5. To understand the scope of work and steps which must be undertaken and completed in order to realize the Port Vision.

Iqaluit Deep Water Port

Phase 1 Planning Workshop
Navigator Inn, Iqaluit
Thursday May 26, 2005

Agenda

1. Welcome -Mayor Elisapee Sheutiapik and Deputy Mayor Glen Williams
2. Introduction of Stakeholders and Project Team Members
3. Review Workshop Objectives and Agenda
4. Background/Overview
5. Report on project findings from research conducted to date.
    - Types of Shipping and Activity Data,
    - Bio-physical and Regulatory Information
    - Port Planning and Engineering Considerations
    - Lessons Learned from other Nunavut Ports – Polaris and Nanisivik
    - Other proposed Nunavut Ports – Kimmirut and Bathurst Port and Road
6. User Needs and Local Objectives

Lunch Break – Noon until 1:30 PM

7. Visioning –
    - How do we see the Iqaluit Deepwater Port?
- Who will it serve and what benefits will be achieved for Nunavut?

8. Brainstorming, identification and discussion of Key Issues – Strengths, Weaknesses, Opportunities and Threats
9. Next Steps – Phase II – Phase III Timetable
10. Workshop Closing

APPENDIX B

STAKEHOLDER

WORKSHOP NOTES

MAY 26, 2005

Iqaluit Integrated Deepwater Port Plan

Stakeholder Planning Workshop
Iqaluit, Nunavut, May 26, 2005

Workshop Notes

1. Introduction

The City of Iqaluit is spearheading the development of a plan for establishment of deepwater port facilities at Iqaluit. The intent of this planning project is to produce an *Integrated Port Facilities Plan* that will meet the long-term needs of Iqaluit for sealift and handling of other large vessels and at the same time provide facilities to address the needs of local commercial and other small and mid-size craft operators.

An essential foundation for pursuing this plan is the establishment of an active stakeholders group representing current and potential users of the proposed new integrated port facilities. It is critical to the success of the project that stakeholders participate fully in all stages of the planning.

An initial meeting of Stakeholders was organized by the City and held in Iqaluit on February 16th, 2005. At that meeting there was discussion of the various groups that use the current Iqaluit harbour, and a presentation by the consulting team on environmental, socio-economic, engineering and regulatory considerations. The key point agreed upon by stakeholders at the initial meeting was that the planning must addresses the needs of all users. Planned facilities must serve not only large vessels, but also the mid-size and smaller vessels that use the harbour and are an essential element of the economy and future growth of Iqaluit and Nunavut. Final port concepts must meet local objectives for users in Iqaluit and at the same time provides benefits to all of Nunavut.

The second meeting of Stakeholders was held in Iqaluit on May 26th, 2005. This meeting included an expanded Stakeholder group representing:

- City of Iqaluit
- Government of Nunavut, Legislative Assembly
- Government of Nunavut, Department of Environment
- Government of Nunavut, Department of Community Government and Services
- Amarok Hunters and Trappers Association
- Baffin Fisheries Coalition
- Qikiqtaaluk Corporation
- Local Cargo Hauling
- Nunavut Eastern Arctic Shipping (NEAS)

- Nunavut Sealink and Supply Inc. (NSSI)
- Uqsuq Oil
- Iqaluit Chamber of Commerce
- Nunavut Economic Forum
- Nunavut Tungavik Inc.
- Government of Canada, Department of Fisheries and Oceans

A list of participants is provided in Appendix 1.

Opening comments at the May 26th workshop were made by both Mayor Elisapee Sheutiapik and Deputy Mayor Glen Williams. City representatives noted that the City has obtained resources to hire a consulting team under Aarluk Consulting and Gartner Lee Limited to work on initial project research and to bring together the various Stakeholders to identify the opportunities and challenges in achieving the goal of establishing integrated port facilities. Objectives for the workshop were:

1. To ensure that stakeholders have a common understanding of circumstances and factors affecting marine activity in Frobisher Bay, specifically with respect to:
   - Current status of marine vessel activity and results of research and special studies undertaken in recent years. (1980-2005)
   - Growth of types of marine vessel traffic in Frobisher Bay over the past several years
   - Environmental and Regulatory considerations concerning construction and operation of Deepwater Port facilities

2. To identify user group needs in relation to the establishment of an Iqaluit Deepwater Port:
   - Medium to Long Term potential of marine vessel activity with or without a Deepwater Port Facility
   - Opportunities and Challenges impacting on the establishment of Deepwater Port Facilities in Iqaluit

3. To Explore and Identify Basic Concepts and Options to meet Local Objectives of a Deepwater Port.

4. To develop a Vison and Planning Framework for the establishment and operation of a Deepwater Port facility in Iqaluit.

5. To understand the scope of work and steps which must be undertaken and completed in order to realize the Port Vision.

A complete statement of objectives and the agenda for the workshop are provided in Appendix 2.

The workshop was facilitated by the consulting team – Terry Forth and Fred Weihs of Aarluk Consulting, and Steve Morison and Chris Anderson of Gartner Lee Limited. During the morning session, the consulting team presented the results of research to date, and a summary of engineering and environmental considerations. In the afternoon session, detailed discussions

were held among the stakeholder representatives on their current situation. potential for development, and the specific needs of each group in relation to integrated port facilities. The participants also developed a draft Vision Statement for development of integrated port facilities, and identified next steps required to pursue the project. The results of these discussions are presented in the notes below.

2. User Groups: Current Situation and Potential

a) General Cargo Shipping

Current Situation

Number of shipments:

- Initial data on shipping to Iqaluit was obtained from the Canadian Coast Guard for the 12-year period 1992-2003;
- Over the entire period 1992-2003, there were 150 vessels landing general cargo in Iqaluit, or an average of 13 shipments annually;
- From 1992-1997, there were 8 shipments on average annually, and from 1998-2003 the average number of shipments doubled to 16 annually;
- One of the larger cargo ships currently in use is 361 feet in length and has a minimum draught of 25 feet;
- There were also 9 shipments of general cargo by tug and barge over the period, with 8 of these occurring between 1999 and 2003.

Shipping season:

- Over the 12-year period, the earliest general cargo shipment arrived in Iqaluit June 30th;
- Last shipment left Iqaluit November 17th.

Unloading times and costs:

- Over the 12-year period, general cargo vessels spent an average of 4.3 days in harbour;
- In 2003, the days spent in harbour by general cargo vessels ranged from 1 day to 14 days;
- Currently, sealift is a tidal operation which involves handling of cargo up to four times, and there is significant damage during transfer by barge in rough water;
- The number of times goods are handled adds to the overall cost of shipping, since the risk of damage is estimated for each time goods are handled and taken into account in crating,
- The number of days in harbour represents direct costs to shipping company, which is passed on to consumers;
- The beach master system costs the federal government about $300,000 per year; currently there is no system for cost recovery;
- There is some uncertainty whether the Canadian Coast Guard will continue to operate the beach master service.

Nature of the sealift:

- Previously, standard sealift packaging was in 2.5 cubic metre crates of approximately 100 kilos each;
- In recent years, package size of sealift goods has been decreasing, with an increasing number of complaints related to problems of consolidation and getting delivery of smaller packages;
- This has resulted in a strong trend to containerization of cargo and use of larger ships.

Transshipment:

- Transshipment of cargo on to other communities is already occurring through Iqaluit;
- Current transshipment volumes are low, but increasing.

Potential

- In the future, carriers will move increasingly to accepting small packages and containerizing shipments, with shipments going to a redistribution centre for distribution to customers;
- This will allow vessels to move to more secure facilities, and will reduce handling and damage;
- Containerization will result in reduced shipping costs.
- There is also great potential for increased transshipment, however the required infrastructure in not currently in place

b) Petroleum

Current Situation

Number of shipments and volumes:

- Coast Guard data on petroleum shipments shows that there were 53 tankers delivering petroleum products to Iqaluit from 1992 to 2003, an average of 4 tankers per year;
- Number of tankers has remained fairly constant over the years, but size of shipments are increasing;
- Volume of fuel delivered in 2004 was 47.7 million litres;
- Projected volume of fuel to be delivered in 2005 is 70.0 million litres.

Shipping season:

- Over the 12-year period, earliest petroleum shipment arrived in Iqaluit June 26th;
- Last shipment left Iqaluit November 28th.

Unloading times:

- Over the 12-year period 1992-2003, average days spent in the Iqaluit harbour were 3.8 days;
- In 2003, days spent in harbour ranged from 3 days to 5 days.

Current issues:

- The major problem facing petroleum shipments is accessibility;
- Until a couple of years ago, the sealift season for petroleum was 6 to 8 weeks in duration;
- Now the sealift season lasts from the end of June right up to the end of November, a period of 5 months;
- The increase in the shipping season has created increased risk;
- By November, the sealift is operating with ice present and in 20 hours of darkness, coupled with an increased likelihood of high winds and otherwise stormy weather;
- At this time of year, it is not possible to get to the ship unloading location any more by water, and it is no longer possible to adequately patrol the ship to shore pipeline or the onshore pipeline;
- A single 1000 to 1500 foot floating hose line is used, which can be a navigation hazard;
- Onshore, there is a single 10 inch line;
- An air plug is used to separate the petroleum products;
- The work at this time of year is very risky for workers, and they have no shelter from the weather;
- Once the ship is hooked up to the shore manifold, the whole operation becomes the responsibility of the terminal;
- If a problem (i.e. a leakage or spill) did occur, it becomes an issue of accessibility and of safety;
- Right now, the spill contingency plan only applies to the land; there is no spill contingency plan applicable to the ship to shore operation;
- All of these factors mean that it is a very high risk operation;
- There is a clear environmental risk in transferring fuel in later fall/early winter that is not adequately covered in current spill contingency plans; to date there have no incidents in regards to fuel transfer however the risk remains high with the current method of fuel transfer.

Potential

- The potential for increased sales of petroleum products through Iqaluit is very great;
- This includes bunkering (refueling) of ships in the area and fuel deliveries to other projects (e.g. mining sites);
- The capacity is present in Iqaluit to hold fuel for meeting the needs of a variety of customers outside the direct needs of the city;
- Fishing vessels, cruise ships, exploration company vessels, military vessels in the area all require refueling;
- However, the demand for vessel refueling either cannot be met with current facilities, or can only be met at very high risk;
- Many vessels won't come into the Iqaluit harbour because they can't take on fuel there given current facilities;
- Refueling of vessels requires a safe docking facility with hydraulic arms;
- The environmental risk associated with fuel transfer is more easily managed in a port facility.

c) Small Cargo Vessels and Other Small Craft

Current Situation

- Small craft (less than 10 m in length) are the most frequent users of the harbour, and many of the operators are hunters, along with small and mid-size cargo or tourism operators;
- A boat and motor is the largest capital expenditure required for any hunter;
- However, there is little data currently available on use of the Iqaluit harbour by small and mid-size vessels;
- The Government of Nunavut is planning a survey to look at small craft use in communities, but the current survey will not include Iqaluit;
- Insurance for small craft is very expensive and often unaffordable; the high cost of insurance is directly related to the lack of infrastructure in Iqaluit;
- Currently, refueling of smaller boats is a high risk procedure: there is no proper fuel truck access and fuel is transferred from oil drums;
- A lot of vessels want to come to Iqaluit to refuel, but can't because of lack of facilities;
- There is no designated area and no facilities for storage of smaller boats, which are currently just pulled up on the shore in a very crowded area, resulting in significant damage to the boats from snow removal, snowmobile traffic, etc.;
- The current breakwater does not provide adequate protection:
    - Leaving, landing, loading and unloading of small craft at the breakwater can be done only during 1 to 2 hour period every 12 hours at high tide;
    - There is no sheltered anchoring available in the water all of the time, since the area protected by the breakwater is dry for much of the tide cycle.

d) Fishery

Current Situation

Number of fishing vessels and shipping season:

- Over the 12-year period 1992-2003, only 11 fishing vessels have visited the Iqaluit harbour, an average of about 1 per year;
- The earliest visit by a fishing vessel over the 12-year period was July 29th, and the latest departure of a fishing vessel was November 13th.

Current fishing operations:

- There are three classes of fishing boats –30-64 feet, 65 to 99 feet, and over 100 feet;
- Currently there are 5 vessels operating in the area near Iqaluit that are fishing for turbot;
- The turbot season last from mid-May to December.
- There are 17 offshore shrimp licences in the area, with 152,000 metric tones of quota;
- Currently there are 14 vessels fishing for shrimp, with 15 to be operating next year;
- Shrimp vessels are from 48 m to 63 m in length;
- Shrimp fishing is a year round activity, starting in January in Newfoundland, reaching Baffin in late June and operating in the area until December;

- The vessels hold up to 500 metric tones of product;
- 99% of the fishery products are sold outside of Canada (Europe, Asia, etc.);
- Fishing vessels require port facilities to unload and transship product, cold storage facilities, and services for food, fuel, oil, and crew changes;
- There needs to be increased access for Nunavut to the fishery: current access and allocation arrangements discriminate against Nunavut, which is the only coastal jurisdiction in Canada that does not have access to the majority of its adjacent fish resources;
- Infrastructure is required to enable Nunavut to land and process its own fish resources;
- Nunavut has been excluded when the federal government has made major marine infrastructure investments for harbours, ports, service centres, processing plants and cold-storage facilities;
- There are no facilities in Baffin to properly accommodate fishing vessels: currently, vessels leave the Baffin area and go to Nuuk or St. Anthony land their catch, resupply and refuel, and then head back up to the Baffin area to fish again, which is an expensive method of operating for the fishing companies;

Potential

- Construction of port facilities in Iqaluit would change the economics of the whole picture, making Iqaluit an economic option for loading, offloading, trans-shipment, refueling, etc. of offshore fishing vessels;
- Iqaluit could service fishing vessels in the area from July to November if the required port facilities were available;
- Port facilities in Iqaluit would also help development of inshore fisheries in other communities: fish could be stored in smaller communities in containers, moved to Iqaluit, and then transferred to reefer boats;
- This could help to obtain increased fishery allocations;
- A port facility would provide essential support to the inshore fishery;
- All fish caught off Newfoundland have to be shipped through Newfoundland; this policy can't be implemented in Nunavut currently, because required port facilities do not exist, resulting in a huge economic loss to Nunavut;
- There is a need to get much higher quota allocations: there are no quotas available now around Iqaluit, but they are available around Qikiqtarjuaq, Clyde River, and Pond Inlet;
- If facilities were available, quotas could be fished by Nunavummiut through the inshore fishery.

e) Tourism

Current Situation

- Over the 12-year period from 1992-2003, 6 cruise ships have visited Iqaluit;
- Most cruise ships currently bypass Iqaluit because suitable refueling and resupply facilities are not available;

- Transfer of passenger to shore and back to ship is currently an awkward and sometimes risky operation;
- Cruise ships now refuel directly from a tanker;
- Lack of facilities limits services provided to tourists from smaller tourism operators: tides suitable for loading clients into boats in the morning are available only every 2nd week.

Potential

- There is great potential for tourism development if marine facilities were developed;
- This would double the time smaller tourism operators could be providing services to clients;
- Mid-size passenger boats could be chartered by local tourism operators;
- Large cruise ships would have a convenient port for refueling, resupply, and exchange of passengers.

f) Coast Guard and Military Vessels

Current Situation

- Over the 12-year period from 1992-2003, 72 Coast Guard icebreakers have operated around the Iqaluit harbour, an average of 6 per year;
- Over the 12-year period, only 3 other Coast Guard or military vessels have visited Iqaluit;
- The earliest arrival of a Coast Guard or military vessel over the 12 years was June 26th, and the latest departure was November 15th.
- The resupply and refueling of the military vessels is a high risk operation.

Potential

- There should be increased activity by military vessels in the future related to considerations of sovereignty;
- There should also be increased activity of research vessels related to research in climate change, etc.

3. Engineering and Environmental Considerations

1980 Engineering Study:

- The 1980 preliminary engineering study prepared by Public Works identified Inuit Head as the preferred location;
- The engineering study looked at construction of a deep sea port, with a 77 metre concrete caisson wharf connected by a causeway to an open storage area, a transit shed, and an 1.6 kg roadway for access;
- Alternative construction methods considered for the wharf included steel sheet pile bulkhead, timber crib, and floating platform;
- The port would operate late June to November;

- The engineering report noted that construction would required dredging (48,000 cubic metres), and blasting of rock.

Environmental considerations:

- The environmental impact of dredging must be considered: could the proposed causeway be put out further to reduce or eliminate dredging?
- On the other hand, dredged materials could be used to extend existing small boat breakwater;
- The cost of dredging versus extending the causeway farther will have to be considered, and DFO will be looking at the environmental impact of dredging as part of the environmental assessment;
- DFO is pleased to be involved at the start of the planning process for the integrated port facility, and would like to be involved in all phases, particularly during the design stage;
- Concerns were expressed about the use of explosives in the water, the time of year this might be done, and the resulting impact on marine life;
- The potential use of explosives will have to be considered during the environmental assessment;
- If explosives were to be used, advice would be sought from the HTO on when and how to blast in order to minimize the impact on marine life;
- It appears that the route proposed for the access road does not impact on areas of existing grave sites; however, the route of an access road needs to be examined in more detail;
- Options for the road to span the existing gap (construction of a bridge versus in-filling of the gap) need to be examined in terms of cost, impact on marine life, and impact on boating routes and operations (existing gap provides sheltered passage for smaller vessels in rough weather);
- Under the Fisheries Act, there is a requirement for compensation for damage to fish habitat: if a portion of fish habitat is negatively impacted by port construction, equivalent new habitat has to be created elsewhere;
- Guidelines on fish habitat compensation can be obtained from DFO;
- If compensation for the alteration of fish habitat is required for the port project, it would be useful to look at the option of building up the habitat in the Sylvia Grinnell River, which is an important char river for the community of Iqaluit;
- Members of the HTO are very concerned about the transfer of petroleum from tankers that arrive in October and November: there is a high risk of spills, given the heavy winds and rough water in October/November, and this would be a very serious situation if a spill did occur.

6. Needs of Users in Relation to Integrated Port Facilities

Dry Cargo

The needs of users shipping general cargo to Iqaluit in relation to integrated port facilities include:

- Vessels to be able to move to a secure facility for off-loading;
- Reduced time for discharging cargo;
- Safer environment for unloading cargo;
- Reduced number of handlings for cargo, which will reduce crating costs as well as handling costs;
- Facilities to handle containerization and redistribution of cargo, that will handle smaller lots of goods;
- One or two berths for vessels, depending on the number and volume of cargo shipments, and the ability to adequately schedule shipments.

Petroleum

The needs of users shipping and receiving petroleum include:

- A safe dock for transfer of petroleum, with a hydraulic oil transfer arm, and direct access to the pipeline;
- Implementation of best practices for the transfer to petroleum from tankers to shore facilities, and for bunkering (refueling) of vessels.

Small Craft/Cargo

The needs of users with small craft and mid-size vessels, including hunters, mid-size cargo vessel operators and tourism operators, include:

- Safe, protected anchorage in the harbour;
- A place to gain access to boats throughout the whole tide cycle;
  - Possibly a floating dock and access ramp for small and mid-sized vessels;
  - A slip to put larger boats in and out of the water;
  - Fixed point to unload fish to dock level by crane;
  - Vehicle access to the wharf;
- Facilities for safe resupply and refueling (gasoline and diesel), accessible at any tide;
- Permanent fueling facility (gas bar) to replace refueling from truck and drum, for both gas and diesel;
- An area to haul out for maintenance and safe storage: possibly a slip with a trolley for facilitating removal of boats, and an area for safe storage linked by the trolley;
- What about cost of fees for use of dock versus current no cost for anchoring;
- A protected area for anchorage with water present all the time: possibly extend the existing breakwater to small island, or construct an additional breakwater.

Fishery

The needs of users involved in offshore and inshore fishery operations include:

- Port facilities for docking, and facilities for cold storage, refueling, resupply and crew change, and transshipment to market;
- Unloading of palletized fish for larger boats, buckets for small inshore vessels.

7. Vision Statement

The stakeholder representatives at the workshop prepared the following draft vision statement for development of the Iqaluit integrated port facilities:

> **The vision for the Iqaluit Deep Water Port Facilities is to provide services for the residents of Iqaluit and the region that are integrated for a variety of users to ensure safe and timely access, and that support the efficient shipping of goods using the best environmental practices, and to provide the infrastructure necessary to serve and promote industries such as tourism, commercial fishing, mineral exploration and traditional pursuits, while at the same time ensuring the protection of marine assets.**

5. Options for Management of Port

The stakeholder representatives identified the following options for management of the integrated port facilities. The management functions would encompass the port and harbour operations, beach master duties, and collection of user fees. Facilities would be required to accommodate Canada Customs operations. These management options are to be explored further in subsequent stages of the research and development of the integrated port plan.

1. Independent Port Authority
2. Local Board
3. City of Iqaluit
4. Transport Canada
5. Private enterprise
6. Phased approach to management, starting perhaps as a joint venture among the City of Iqaluit, the Government of Nunavut, and the Government of Canada, and evolving to private sector or port authority management arrangements.

8. Moving Forward

a) Directions and Sources for Further Research

1. Current and forecast traffic by all users:
   - Look at Port of Churchill for comparisons;
   - Conduct market survey to determine extent to which user groups will utilize integrated port facilities;

- Sources of information on fishing vessels:
  - Government of Nunavut Fisheries Strategy documents;
  - Look at number of vessels currently operating in the area that would come into Iqaluit for provisioning and repair if the infrastructure was there;
  - Fishing vessels are licensed by DFO; should be able to identify where the fishing vessels are going and why;
  - Fisheries Coalition is a source of information;
  - CMAC review should provide useful information: source is Peter Kanunan, Winnipeg
- Sources of information on tourism:
  - Sources for data on larger passenger ships are GN Dept. of Economic Development and Nunavut

2. Economic Development
   - In developing the integrated port concept and presenting it to government, it is essential to tie port planning to priorities for environmental protection and economic development.

3. Port Management
   - A major question for planning is who will manage the port facilities;
   - Investigation and research into this must be pursued actively.

4. Operating Costs and User Fees
   - Port will have to be self-sufficient in O&M;
   - Therefore, need to address ongoing O&M costs, and extent to which user fees are required;
   - Quantify efficiencies and benefits to existing users, compared to any additional user fees and costs;
   - Investigate option of having shipping fees go to local authority.

b) Next Steps

1. Obtaining Initial Support:

- Concept for integrated port facilities has widespread support from current City Council;
- Need to inform public of advantages to the community as a whole, and obtain further input on community needs, and input from Inuit Qaujimajatuqangit;
- Need to go to Assembly at next sitting and obtain support:
  - Each stakeholder group should write directly to the three MLAs, with a copy to the City, to obtain a letter of support;
- Will need to lobby in Ottawa for support and to identify potential sources of funding, based on preparation of a detailed business case document and proposal.

2. Preparation of Business Case:

- Need to build a comprehensive business case to provide information and obtain support of Government of Nunavut, Government of Canada, industry and other user groups, and public;
- The Business Case document will include:
  - Rationale for construction of integrated port facilities at Iqaluit;
  - Quantification and comparison of efficiencies and other benefits created by new facilities, and potential costs to users;
  - Proposal for phased funding related to port development schedule, addressing both public and private funding partnerships;
  - Overall cost and timing for planning, design, construction and operation of integrated port facilities;
  - Consideration of impact on environment, to be fully investigated through subsequent environmental assessment;
  - Analysis of feasibility.

Appendix 1: List of Stakeholder Representatives

Name	Organization
Mayor Elisapee Sheutiapik	City of Iqaluit
Deputy Mayor Glen Williams	City of Iqaluit, and local tour operator/outfitter
Kim Rizzi	City of Iqaluit – Economic Development Officer
Hunter Tootoo	MLA – Iqaluit Centre
Wayne Lynch	Dept. of Environment – GN Fisheries
Joshua Kango	Board Member –Amarok HTA
Sammy Josephie	Board Member –Amarok HTA
Sytukie Joamie	Secretary Manager –Amarok HTA
Peter Keenainak	Qikiqtaaluk Corporation
Russell Chislett	Owner/Operator – Soapstone Hauling
Archie Angnakak	NEAS - Iqaluit
Glenn Cousins	President, Iqaluit Chamber of Commerce, and Manager of Northmart Store
John Paton	Nunavut Sealink and Supply Inc. (NSSI)
Barry Cornthwaite	NSSI and Arctic Coops Ltd.
John Dawe	Community Government and Services, Government of Nunavut
Monica Ell	Director of Business Development, NTI; also representing the Nunavut Economic Forum
Scott Cooper	Uqsuq Oil
Andrejka Lokar	Fisheries and Oceans, Government of Canada
John Fast	Community and Government Services, Government of Nuanvut
David Alexander	Baffin Fisheries Coalition

Appendix 2: Workshop Objectives and Agenda

Iqaluit Deepwater Port, Stakeholder Workshop
Objectives for the Workshop

Overall Purpose:

Complete the Initial Phase 1 Planning for an Iqaluit Deepwater Port by the Stakeholder Group

Specific Workshop Objectives:

1. To ensure that stakeholders have a common understanding of circumstances and factors affecting marine activity in Frobisher Bay, specifically with respect to:

    - Current status of marine vessel activity and results of research and special studies undertaken in recent years. (1980-2005)

    - Growth of types of marine vessel traffic in Frobisher Bay over the past several years

    - Environmental and Regulatory considerations concerning construction and operation of Deepwater Port facilities

2. To identify user group needs in relation to the establishment of an Iqaluit Deepwater Port

    - Medium to Long Term potential of marine vessel activity with or without a Deepwater Port Facility

    - Opportunities and Challenges impacting on the establishment of Deepwater Port Facilities in Iqaluit

3. To Explore and Identify Basic Concepts and Options to meet Local Objectives of a Deepwater Port

4. To develop a Vison and Planning Framework for the establishment and operation of a Deepwater Port facility in Iqaluit.

5. To understand the scope of work and steps which must be undertaken and completed in order to realize the Port Vision.

Iqaluit Deep Water Port

Phase 1 Planning Workshop
Navigator Inn, Iqaluit
Thursday May 26, 2005

Agenda

1. Welcome -Mayor Elisapee Sheutiapik and Deputy Mayor Glen Williams
2. Introduction of Stakeholders and Project Team Members
3. Review Workshop Objectives and Agenda
4. Background/Overview
5. Report on project findings from research conducted to date.
    - Types of Shipping and Activity Data,
    - Bio-physical and Regulatory Information
    - Port Planning and Engineering Considerations
    - Lessons Learned from other Nunavut Ports – Polaris and Nanisivik
    - Other proposed Nunavut Ports – Kimmirut and Bathurst Port and Road
6. User Needs and Local Objectives

Lunch Break – Noon until 1:30 PM

7. Visioning –
    - How do we see the Iqaluit Deepwater Port?
- Who will it serve and what benefits will be achieved for Nunavut?

8. Brainstorming, identification and discussion of Key Issues – Strengths, Weaknesses, Opportunities and Threats
9. Next Steps – Phase II – Phase III Timetable
10. Workshop Closing