

1. EXECUTIVE SUMMARY	5
2.1. The Arctic Environment	6
2.1.1 Distinctive Features	6
2.1.2 Canadian Hydrographic Service	6
2.2. Vessel Traffic in the Arctic	7
2.3. Trends	8
2.3.1 Commercial Vessels	8
2.3.2 Cruise Ships (Passenger Ships)	8
2.4. Reported Marine Occurrences in the Canadian Arctic from 2010 to 2013	9
3. CURRENT REQUIREMENTS FOR ARCTIC NAVIGATION	10
3.1. Canadian Requirements	10
3.2. Russian Requirements	11
3.3. United States Requirements	11
4. RISK MANAGEMENT	11
4.1. Risk Assessment	11
4.2. Prevention	12
5. TULAKTARVIK'S RECOMMENDATIONS	14
Recommendation 1 – Expedite mapping of the Arctic	14
Recommendation 2 – Conduct independent studies to identify navigational risk areas	14
Recommendation 3 – Establish secured navigational routes in the Arctic to minimize response time	14
Recommendation 4 – Station permanent assistance vessels	14
Recommendation 5 – Implement a toll system	14
Recommendation 6 – Minimize administrative and response times	14
Recommendation 7 – Use Inuit knowledge of the region	14
APPENDIX A – Routes of the Northwest Passage and Northern Sea Route	15
APPENDIX B – Marine Traffic in the Arctic, 1974–2007	16
APPENDIX C – Who's Tulaktarvik	17

1. EXECUTIVE SUMMARY

Tulaktarvik, an Inuit-owned company and the operating entity of the partnership, combines the know-how of 30 years with the northern experience of Qikiqtaaluk Corporation (**APPENDIX C**).

Tulaktarvik's mission is to improve the development of marine services in Nunavut by bringing innovative solutions and services that support the growth of Nunavut's infrastructure while creating meaningful employment and career development opportunities for the Inuit. Tulaktarvik offers solutions adapted to the unique conditions of the Arctic.

It goes without saying that Tulaktarvik has a vested interest in the Canadian Arctic marine industry's development; nevertheless, ocean-related industries must not, in any way, place at risk the fragile Arctic environment.

We believe that Canadian authorities should favour prevention and promote response readiness. Tulaktarvik feels that prevention measures such as those being implemented in other comparable countries would rapidly and significantly help promote safe shipping in the Arctic. Our recommendations are based on reports from various Canadian and foreign experts, government departments and agencies.¹

Tulaktarvik's recommendations:

- Expedite the mapping of the Northwest Passage;
- Conduct independent studies to identify navigational risk areas;
- Establish secured navigational routes in the Arctic, and station assistance vessels in risk areas along these routes to minimize response time;
- Implement a toll system to prevent assistance services from imposing a financial burden for the government;
- Align regulatory approaches in the Arctic with current Canadian standards by giving the lead to Transport Canada (TC);
- Use Aboriginal knowledge of the region by training and equipping the local workforce so it may be directly involved in response agencies and organizations;
- Create response organizations, similar to ECRC², that include a significant Inuit involvement;
- Set up response equipment depots north of 60°N latitude to minimize response delays.

¹ TC, TSB, DFO, CCG, UN-IMO, Washington Department of Ecology, etc.

² Eastern Canada Response Corporation

2. BACKGROUND INFORMATION

2.1. The Arctic Environment

2.1.1 Distinctive Features

Even for the most experienced navigator, transiting in the Arctic, particularly in less travelled areas, can be a slow and cautious exercise.

The International Maritime Organization (IMO) has recognized that ships operating in the Arctic and Antarctic are exposed to a number of risks such as poor weather conditions and that the relative lack of good charts, communication systems, and other navigational aids poses a challenge for mariners.³

On April 3, 2012, the Transport Safety Bureau (TSB) expressed the following concerns: The Canadian Arctic Archipelago is very remote from available Search and Rescue (SAR) and pollution response resources. Consequently, accidents such as the grounding of the *Clipper Adventurer* can have far reaching impacts, including the possible damage to or loss of vessels, injuries and loss of human life, as well as damage to the fragile northern environment.⁴

The easing of navigation through the melting polar sea ice and the possibility of a navigable Northwest Passage are raising the prospect of greater physical linkages between Arctic communities and the rest of the world. For Arctic communities, transportation links within the region and beyond have been predominately by air. This is extremely expensive and, given the rising price of fuel, will continue to be so for the foreseeable future. The increased use of marine transport can only help to alleviate the isolation of Arctic communities.⁵

2.1.2 Canadian Hydrographic Service

According to CHS, less than 10% of the Canadian Arctic has been surveyed to modern standards, and many charts are based on information that was obtained more than 50 years ago using less reliable technologies than those that exist today. The routes commonly used are those that have been surveyed more extensively.

³ OMI, "Polar Shipping Safety," <http://www.imo.org/OurWork/Safety/SafetyTopics/Pages/PolarShippingSafety.aspx>, accessed on April 19, 2014.

⁴ TSB, Marine Investigation Report M10H0006, <http://www.tsb.gc.ca/eng/rapports-reports/marine/2010/m10h0006/m10h0006.asp>, accessed on April, 19, 2014.

⁵ *The Arctic: Transportation, Infrastructure and Communication*, Industry, Infrastructure and Resources Division, <http://www.parl.gc.ca/Content/LOP/researchpublications/prb0808-e.pdf>, accessed on April,17, 2014.

Many hydrographic charts of the area contain only limited information, are updated infrequently, and include chart notes, "Danger, Chart Contains Positional Errors. Use with extreme caution."⁶

2.2. Vessel Traffic in the Arctic

Until 1988, there were few passenger ships voyaging in the Arctic. In the years 1980–1987, there were only 4 Arctic passenger voyages conducted by one passenger vessel. However, in the past 7 years, there have been a total of 105 separate voyages conducted by 7 different passenger vessels. During this time, there has been an average of 9 passenger vessels per year conducting a total of 15 voyages per year. With approximately 105 passengers per voyage, this gives a total of about 1575 passengers in the Arctic every year.

Of the 118 vessels in the Canadian Arctic that conducted 284 voyages in 2011, there were 15 tankers and 7 passenger vessels. Tankers are considered high risk because an accident could have severe environmental consequences. Passenger vessels are also considered high risk since, among other consequences, an emergency in the Arctic could leave passengers and crew stranded for an extended period of time in a harsh environment.

Table 1 – Commercial vessels, including voyages conducted by cruise ships in Arctic waters in 2013 (NORDREG ZONE)

Year 2013	Cargo	Tankers	Tugs	Passenger Ships	Container Ships	Grain Ships	Fishing Vessels	Total
Ships	11	11	20	9	5	17	22	95
Voyages	35	28	36	17	10	17	128	271

Source: Canadian Coast Guard, April 15, 2014.

Note: Other vessels are not included in this table: Government Vessels (CCG/USCG, National Defense, RCMP), research vessels, pleasure crafts, etc.

It is expected that, with the continued melting of polar ice, traffic will increase as vessels (particularly foreign flagged and crewed) increasingly use the Northwest Passage and new and previously inaccessible areas open up for passenger ships to visit. The TSB expressed concern that, given the remoteness of the region, the navigational challenges of the Arctic, and the potential unfamiliarity of foreign crews with Arctic navigation, ships, passengers, crew and the environment are at risk.⁷

For instance, in October 2013, the *Nordic Orion* was the first large cargo ship (75,000 gross tonnage) to ply the Arctic from West to East, from the Pacific to the Atlantic, a

⁶ Canadian Coast Guard Web site, <http://www.ccg-gcc.gc.ca/shorelinesfall2011-3>.

⁷ <http://www.tsb.gc.ca/eng/rapports-reports/marine/2010/m10h0006/m10h0006.asp>.

legendary route, full of icebergs, remote and poorly mapped, and far from any salvage operator. The 225-metre ship left Vancouver, BC, loaded with Canadian coal destined for a Finnish smelting company. Through the typical Panama Canal route, the cargo would have sailed 1,000 more nautical miles and spent \$80,000 more on fuel, according to its Danish-owned freighter's operator, Nordic Bulk Carriers.

According to the Danish operator, "The Northwest Passage cuts one week from the conventional route through the Panama Canal, saves money and fuel and, most importantly, allows a 25% increase in cargo."⁸ The *Nordic Orion* loaded 15,000 tons more coal than it would have on a typical voyage through the more shallow Panama Canal. "Sailing the Northwest Passage is a high-risk strategy, but with high potential profit."⁹

2.3. Trends

2.3.1 Commercial Vessels

In the Arctic, since the navigation period cannot be predicted and the ice moves, there is a large part of uncertainty in the transit time. For container ships, carriers sell a firm delivery date. They cannot afford delays and specific equipment, a crew with Arctic experience, and higher insurance costs are required. There are heavy financial penalties for delays. Additionally, winter navigation remains impossible, which means logistical changes twice a year, an expensive process for carriers.

2.3.2 Cruise Ships (Passenger Ships)

Another sector with a constant growth since 1974 that directly affects Arctic navigation is the cruise sector, which has been rapidly expanding since the 2000s (Dupré, 2008)¹⁰. According to Vail and Clinton (2002)¹¹, it is difficult to determine its value, but some observers believe the cruise sector injects more than \$4 million into Nunavut's economy annually.¹²

The presence of large cruise ships (*The World* can accommodate 500 passengers) with minimal ice classes and the potential unfamiliarity of foreign crews with Arctic navigation raises safety concerns for human lives in case of accident. Recall that the *MS Explorer* sank off Antarctica in 2007 even with a 1AS ice class.¹³

⁸ Nordic Bulk Carriers, <http://fr.reuters.com/article/topNews/idFRPAE98Q06U20130927>, accessed on April 14, 2014.

⁹ Knut Espen Solberg, Arctic Sea Specialist, DNV Norwegian Maritime Services Company.

¹⁰ Dupré Sophie, *Les croisières touristiques dans l'Arctique canadien : une réalité tangible à l'appropriation territoriale encore limitée*. Laval University.

¹¹ Clinton and Vail. (2006). Nunavut Economic Outlook. Update of five years of progress. Nunavut Economic Forum.

¹² Laval University, Electronic Thesis Collection, *Évolution du transport maritime dans l'Arctique depuis 1974 : quelles tendances?*, <http://archimede.bibl.ulaval.ca/archimede/fichiers/26043/ch05.html>.

¹³ Frédérique Lasserre, Laval University, interviewed on April 30, 2014.

Certain abuses have also been noted in the American Arctic, where no specific regulation for ice navigation exists. For instance, the cruise ship MS *Hanseatic* anchored off the shore of Barrow, Alaska, in September 2013. It carried more than 300 passengers and crew and ferried passengers ashore in rigid-hulled inflatables without any formal entry into the United States.¹⁴

2.4. Reported Marine Occurrences in the Canadian Arctic from 2010 to 2013

Table 2 – Salvage and Rescue Operations Annually, Northwest Territories, Nunavut and Hudson Bay

2010	2011	2012	2013
23	28	34	14

Source: Canadian Coast Guard, April 15, 2014.

An average of 24,75 Salvage and Rescue operations annually for the last 4 years. Note: 271 vessel voyages were reported in the Canadian Arctic in 2013 (Table 1).

2.4.1. Grounding of the Passenger Vessel *Clipper Adventurer* on August 7, 2010, in Coronation Gulf, Nunavut

On August 27, 2010, at approximately 18:32, the passenger vessel *Clipper Adventurer* ran aground in Coronation Gulf, Nunavut, while on a 14-day Arctic cruise.

With a 4,376 gross tonnage, a 4.6-metre maximum draft, 3,884-kW twin propellers and 90.91 metres long, the *Clipper Adventurer* was built in Yugoslavia in 1975. The vessel has an ice-strengthened hull (1A *Lloyd's Register* ice class). At the time of the occurrence, the vessel was carrying 128 passengers and 69 crew members.

According to the TSB report,¹⁵ the *Clipper Adventurer* accident was caused by a succession of errors and breaches of rules by the ship owner, the carrier and especially the master and officers. The vessel, its passengers and crew were placed at risk, and the accident could have had very serious consequences for the environment, given the particular conditions of the Arctic.

According to the TSB report, it took:

¹⁴ *Responding to Oil Spills in the U.S. Arctic Marine Environment*, Committee on Responding to Oil Spills in the U.S. Arctic Marine Environment; Ocean Studies Board; Polar Research Board; Division of Life and Earth Studies; Marine Board; Transportation Research Board; National Research Council. 2014.

¹⁵ See the complete report: <http://www.tsb.gc.ca/fra/rapports-reports/marine/2010/m10h0006/m10h0006.asp>.

- 2 days for the first salvage and rescue vessel, the CCGS¹⁶ *Amundsen*, to arrive on the scene and conduct hydrographic surveys of the area throughout to ensure its own safety before initiating the salvage operation;
- 3 days for the 128 passengers to be transferred from the *Clipper Adventurer* to the *Amundsen* and taken to Kugluktuk;
- 4 days for the first vessel tasked with assisting with pollution control, the CCGS *Sir Wilfrid Laurier*, to arrive at the grounding site;
- 5 days for a dive team and a salvage company, hired by the ship management company to refloat the *Clipper Adventurer*, to arrive on site;
- 6 days for a salvage planning meeting to be held on board with all concerned parties including representatives of the owner, insurer, Lloyds Registry, the Canadian Coast Guard, TC, the flag state, and the vessel's crew;
- 7 days before the salvage company hired the AHTS *Alex Gordon* and the tug *Point Barrow* which had arrived on the scene;
- (On 6 September, 11 days after the vessel ran aground, with the wind north-westerly at 40–45 knots, gusting 49 knots, with approximately 2- to 3-m seas, the vessel began rolling heavily, pitching, and pounding on the sea floor.)
- 11 days before an initial (unsuccessful) attempt was made to tow the vessel off;
- 13 days before the tug *Nunakput* was retained by the salvage company (it arrived 2 days later);
- 16 days before 2 more (also unsuccessful) salvage attempts were made using roller bags and 3 tugs;
- 18 days before the salvage company hired a fourth tug, the *Kooktook*;
- 19 days (on September 14) before another attempt was successfully made and the *Clipper Adventurer* was towed to safety.

3. CURRENT REQUIREMENTS FOR ARCTIC NAVIGATION

3.1. Canadian Requirements

To be allowed to sail in the Canadian Arctic, vessels' authorities:

- must submit a sailing plan report prior to entry in the NORDREG Zone;
- must provide the Governor in Council with evidence of financial responsibility;
- are not required to pay fees north of 60°N latitude;
- must comply with the Zone/Date System (for vessels that carry more than 453 m³ of pollutants);
- must comply with special construction requirements (for vessels that carry more than 453 m³ of pollutants or that exceed 100 gross tonnage);
- must provide a position report immediately after entry into the NORDREG Zone, and daily at 1600 Coordinated Universal Time (UTC);

¹⁶ Canadian Coast Guard Ship

- must provide a final report on arrival at a berth within the NORDREG Zone;
- must provide a final report immediately before exiting the NORDREG Zone.

3.2. Russian Requirements

Vessels sailing the Northeast Passage (Northern Sea Route-NSR) under the Russian jurisdiction must comply with specific regulations that apply to Arctic waters. To be allowed to sail in the Russian Arctic waters, vessels' authorities¹⁷:

- Must have a mandatory vessel inspection conducted;
- Must provide a civil liability certificate;
- Must pay fees to use the NSR;
- Must report position twice a day while in transit in Russian waters;
- Must maintain selected route unless under state "ice pilot";
- Must be assisted by an icebreaker (mandatory) at certain choke points (fees posted and negotiable);
- Must have a *Russian Register* L1, UL or ULA ice class (*Lloyds Register* 1A, 1AS and AC1).

3.3. United States Requirements

Although no American laws specifically regulate navigation in Arctic waters¹⁸, U.S. authorities passed a comprehensive legislative and regulatory framework on oil shipping, the 1990 *Oil Pollution Act* (OPA 90) in the aftermath of the *Exxon Valdez* oil spill which occurred in 1989.

4. RISK MANAGEMENT

4.1. Risk Assessment

The International Maritime Organization (IMO) has recognized that ships operating in the Arctic and Antarctic are exposed to a number of risks such as poor weather conditions and that the relative lack of good charts, communication systems, and other navigational aids pose a challenge for mariners.¹⁹

With no response organization (ECRC type) certified north of 60°N latitude, there is a significant risk of aggravation of an occurrence with consequences on local populations, the environment and Arctic navigation.

¹⁷ www.tc.gc.ca/media/documents/marinesafety/santos-pedro_e.pp.

¹⁸ David R. Avey, Senior Marine Safety Inspector, Safety and Security Group, Transport Canada. Interviewed on May 1, 2014.

¹⁹ OMI, « Polar Shipping Safety », <http://www.imo.org/OurWork/Safety/SafetyTopics/Pages/PolarShippingSafety.aspx>, accessed on April 16, 2014.

The TSB report findings on the *Clipper Adventurer*²⁰ grounding substantiate the existence of the following risks:

- Response, salvage and rescue time in the Arctic takes days and even weeks rather than hours as is the case on typical navigation routes.
- Ship operators, carriers and crews, even with Arctic navigation experience, are not well prepared to face Arctic navigation conditions.
- Obtaining NOTSHIPS through the CCG website can be problematic due to unreliable Internet access north of 60°N latitude.
- Marine infrastructure and services are non-existent along Arctic navigational routes.
- Only 10% of Arctic waters have been chartered.
- Resources currently available are not adequate to ensure monitoring and enforcement of legislation, or the safety of passengers, coastal communities and the environment.

4.2. Prevention

Given the increased risks confirmed by all stakeholders, and since there is already traffic in this region and that the trend is rising, a risk management plan must be implemented.

According to Transport Canada, the risk has decreased over the years, primarily due to increased preventative measures that have been implemented, including the phase-in of double-hulled tankers, the requirement to have contracts with response organizations and increased monitoring and inspections.²¹

The first step of a prevention approach would be to certify a response organization north of 60°N latitude as is the case in the South (such as ECRC).

As Transport Canada insists, Tulaktarvik also believes it is important to invest in prevention efforts along Arctic navigational routes given the response constraints in these waters.

To identify areas at risk, nautical charts and publications for considered routes must be produced.

Tulaktarvik believes it is possible to increase safety by taking preventative steps such as ensuring the presence of assistance vessels with appropriate ice classes in strategic zones along the routes identified in order to be able to respond to any distress call from a disabled ship during the navigation period.

²⁰ At the time of the grounding, no salvage vessels were in the area and the CCGS *Amundsen* was approximately 36 hours away from the site.

²¹ Transport Canada, <http://www.tc.gc.ca/eng/marinesafety/tp-tp15039-bground-3179.htm>.

Response vessels and organizations should be able to count on spare equipment and material to minimize response time; depots must therefore be built along the busiest routes.

Additionally, every commercial vessel should have on board appropriate spill control equipment such as anti-pollution oil booms.

Finally, to have, Transport Canada be the sole decision-maker and the sole lead in navigation matters north of 60°N latitude, as is the case in the South, would minimize administrative delays and response time when facing a marine occurrence.

5. TULAKTARVIK'S RECOMMENDATIONS

Since almost 90% of marine accidents are navigation accidents and their consequences are difficult to control, it is important to implement an active prevention plan in risk areas.

Tulaktarvik's recommendations are based on Canadian and international data and best practices in place around the world to provide Canada with a world-class tanker safety plan.

Recommendation 1 – Expedite mapping of the Arctic

The acceleration of the mapping (APPENDIX A) program is essential to complete mapping work for the navigational areas that are currently busiest, and for navigation routes being considered.

Recommendation 2 – Conduct independent studies to identify navigational risk areas

All stakeholders agree that Arctic navigation poses unique challenges. Tulaktarvik considers it pertinent that a group of experts examine the issue and identify the highest-risk areas, where it would be appropriate to implement world-class safety measures.

Recommendation 3 – Establish secured navigational routes in the Arctic to minimize response time

Tulaktarvik believes mandatory navigational routes must be opened to ensure the safety of passengers, coastal communities and the environment, and that a guaranteed assistance service with a prescribed time limit must be implemented along these routes.

Recommendation 4 – Station permanent assistance vessels

It is difficult to secure risk areas without assistance vessels permanently on duty in strategic navigational areas along the prescribed routes that can rapidly respond to a distress call from any vessel during the navigational period.

Recommendation 5 – Implement a toll system

Charging fees for the use of mandatory and secured routes would help to finance a permanent service-vessel assistance system and an Arctic marine infrastructure, similar to the Russian approach for the use of the Russian Northern Sea Route, without increasing public spending.

Recommendation 6 – Minimize administrative and response times

Tulaktarvik believes it would be appropriate for Transport Canada to be the lead regulatory agency 'North of 60' as it currently is south of 60°N latitude, and that Inuit marine response organizations should be accredited by Transport Canada for the Arctic (similar to ECRC for the South).

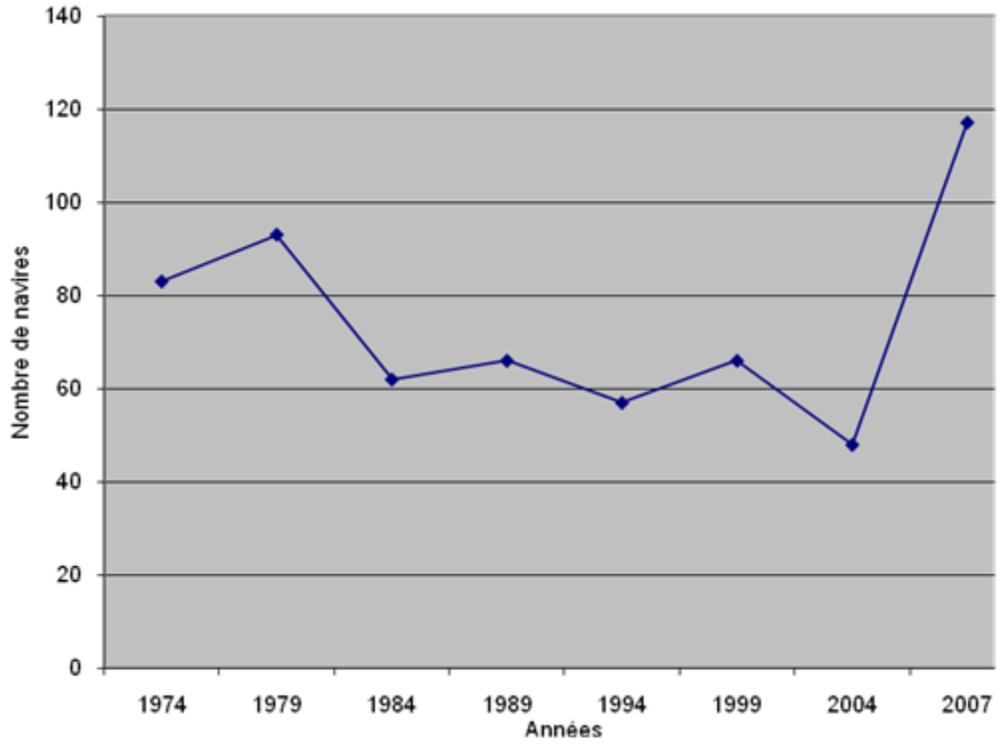
Recommendation 7 – Use Inuit knowledge of the region

Implement and fund training and development programs for local workers to help them gain professional qualifications to be involved in any type of marine emergency response.

APPENDIX A – Routes of the Northwest Passage and Northeast Passage



APPENDIX B – Marine Traffic in the Arctic, 1974–2007



Source: Compiled from NORDREG data.

APPENDIX C – WHO’S TULAKTARVIK



PRESS RELEASE
For immediate release

**NEW PARTNERSHIP TO SERVE
CANADA’S NORTH**

Iqaluit, Nunavut, April 20, 2010 – Qikiqtaaluk Corporation Inc. and Ocean Group Inc. have entered into a partnership to capitalize on the strengths of both firms. Tulaktarvik, an Inuit-owned company and the operating entity of the partnership, combines the know-how of Ocean with the Northern experience of Qikiqtaaluk, making available proven solutions to be adapted for use in the unique conditions of the Arctic.

Tulaktarvik, whose head office is in Iqaluit, will begin its operations in May 2010. Amongst its services, Tulaktarvik will provide ice-class harbour tugs, barges for cargo and for marine undertakings and works, underwater interventions, top-side ship repairs, ship construction, dredging, temporary wharf solutions and platform construction for Nunavut communities and the mining industry.

"Ocean is a world leader in its field. Tulaktarvik’s mission is to improve the development of marine services in Nunavut by bringing innovative solutions and services that support the growth of Nunavut infrastructure. Qikiqtaaluk Corporation has chosen Ocean Group as its partner because of the company's impressive track record in marine services. Tulaktarvik can offer wharf solutions to every Nunavut community as well as to the mining industry," stated Harry Flaherty, President of Qikiqtaaluk Corporation.

Gordon Bain, President and CEO of Ocean Group added: "A joint venture with Qikiqtaaluk Corporation is a significant expansion to the existing cooperation between our two companies. For Ocean Group, it is important to cooperate in long term partnerships with reputable companies such as Qikiqtaaluk Corporation. This newly signed agreement will promote Tulaktarvik as a leader in the marine services industry in Canada’s North for years to come."

PARTNERSHIP TO BETTER SERVE CANADIAN NORTH

About Qikiqtaaluk Corporation

Qikiqtaaluk Corporation (QC) is an Inuit birthright development corporation created by the Qikiqtani Inuit Association. QC is mandated to pursue and develop economic and employment opportunities on behalf of the Inuit in the region. With 70% of its staff of Inuit heritage, QC places a high priority on maximizing employment and training opportunities for Inuit in all of its projects. QC has emerged as a **Nunavut developer and project manager**, and grew up as an experienced partner in various industrial fields, including: Public-Private Development Partnerships, Employment and Training Services, Environmental Management, Transportation and Logistic Services, Offshore Fisheries, Real Estate and Property Management, Construction Development, Petroleum Distribution, Information Technology, and Retail Operations. QC is currently working to develop major infrastructure projects throughout Nunavut, such as ports, airports, hydroelectric plants, housing and commercial facilities, natural resources exploration, etc.

About Ocean Group Inc.

Ocean, recognized as a groundbreaker on the Saint-Lawrence Seaway and the Great Lakes, employs more than 450 people, owns Canada's most important fleet of ice-class harbour tugs and marine equipment. Ocean offers a wide range of integrated services such as harbour towing, pilot boat services, salvage, marine construction and repair, equipment rental, dredging, welding and machining, mechanics, short and long distance transportation by tug and barge, and much more.

The company uses state-of-the-art and innovative operational methods as well as high-tech equipment. It relies on a diversified team of employees, highly qualified in their field and whose know-how is recognized by their peers throughout the country.

CONTACT Qikiqtaaluk Corporation
Mr. Harry Flaherty
President
867-979-8400
hflaherty@qcorp.ca

Ocean Group Inc.
Mr. Philippe Filion
Director – Public Affairs
418-694-1414
Philippe.filion@groupocean.com