

An aerial photograph of two large industrial barges on a body of water. The barges are dark-colored with white superstructures. The water is a deep blue-grey. The text is overlaid on the image.

Preliminary Analysis of an Arctic Route to the Oil Sands

The Mariport Group Ltd

for GNWT Transportation

April 2007



BACKGROUND:

Mariport retained to undertake the preliminary analysis as a desk study.

Draws on experience in Arctic navigation and the Mackenzie River.



OBJECTIVE:

- Determine if the route was feasible
- Determine the limitations
- Assess the opportunities
- Evaluate impact on Mackenzie capacity and risk
- Advise on areas of uncertainty and next steps



STUDY COVERED:

- Shipping and Transportation costs
- Heavy Lift Market
- Arctic Access
- Water Resource issues
- Oil Sands Development
- Impact on Mackenzie River
- Economic Development Opportunities



2. Current Rail/Road Route

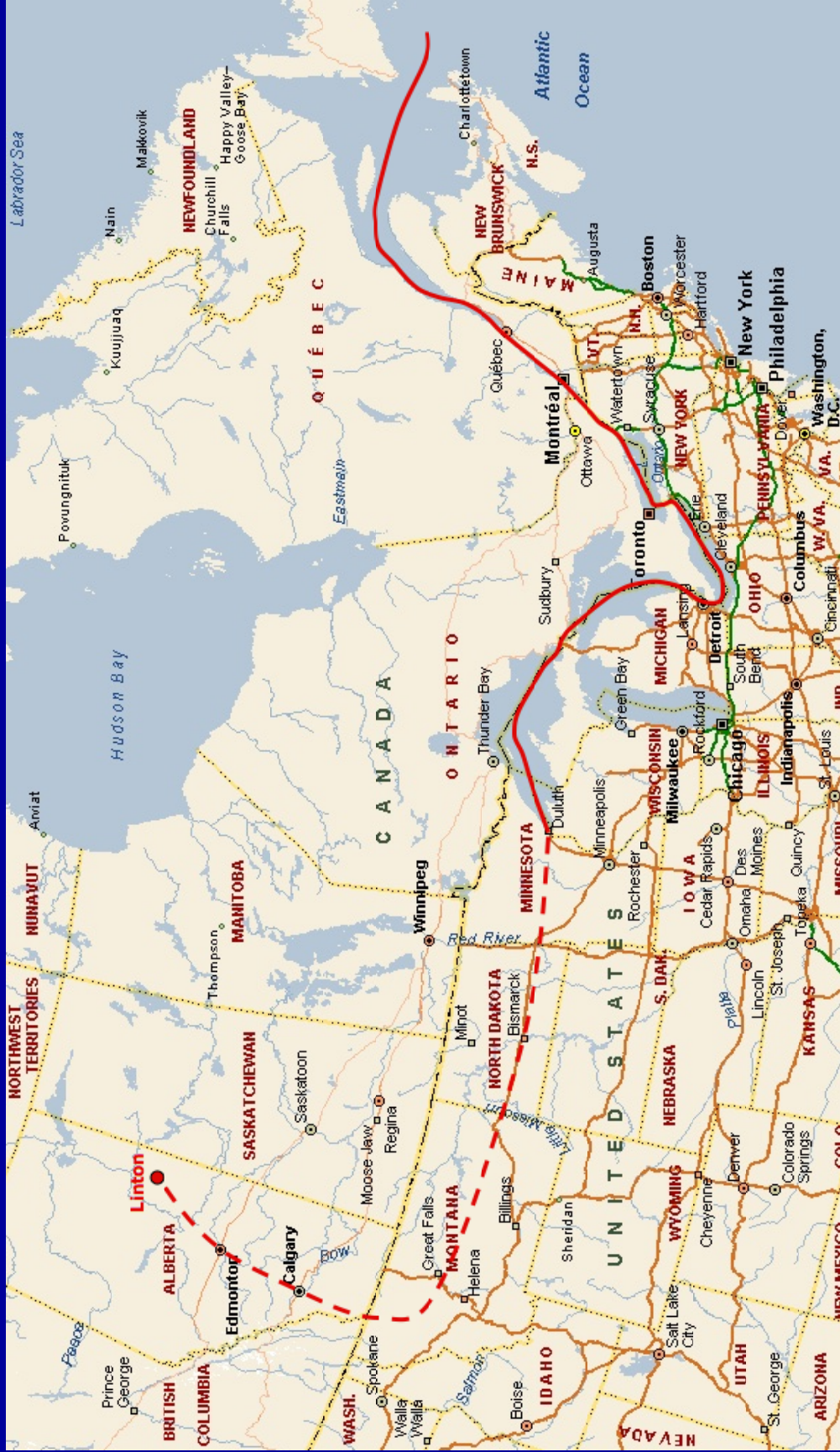
- Limited in capability
- 14'2" width
- 20'2" above the rail (about 16'6" on the rail car)
- 450 tonnes for delivery north of Fort McMurray due to road bridge.





Exemplary move via Duluth





3. Arctic Route

- Effectively removes size limits
- Based on understanding of capability 1,000 tonne loads definitely achievable
- 1,500 tonnes probably achievable
- 2,000 tonnes may not be achievable





INDICATIVE TRANSPORTATION COSTS SINGLE UNIT-1

Europe to Fort MacKay

- via Arctic \$5m
- via Great Lakes \$6m



INDICATIVE TRANSPORTATION COSTS SINGLE UNIT-2

Far East to Fort MacKay

- via Arctic \$6m
- via Great Lakes \$10m



OVERALL COSTS

- Could be reduced by shipping several units on the same vessel
- Costs sensitive to shipping market conditions and availability of suitable heavy lift ships



HEAVY LIFT COMPANIES

- Six companies with capabilities of at least 500tonnes per lift.
- New ships being delivered with capabilities up to 2,000 tonnes
- Seventh company with deck ships that could be considered
- More companies/ships with lesser lifts



HEAVY LIFT FLEET

- About 65 ships by 2009 with a lift of over 500 tonnes
- About 20 semi-submersible ships and barges with lifts up to 20,000 tonnes
- 10 open deck ships





ARCTIC ACCESS – FROM ATLANTIC

Somewhat restricted relative to ice capability of the ship. Reliable access every year not guaranteed, although passage has been open at least part of the last five years. Earliest arrival at Tuktoyaktuk about end August.



ARCTIC ACCESS – FROM PACIFIC

Less restricted relative to ice capability of the ship. Access more reliable. Earliest arrive off Tuktoyaktuk about mid August.





Heavy Lift ship with barges for Cooper Services, 2001



COMPANIES ON THE MACKENZIE

- Horizon North Logistics building six new barges in China
- Cooper Barging delivered three new barges in 2001.
- NTCL is the largest company with an extensive fleet



MACKENZIE RIVER

Season essentially 1 June to mid October. Water depths getting low at end season, but still workable end August/early September.



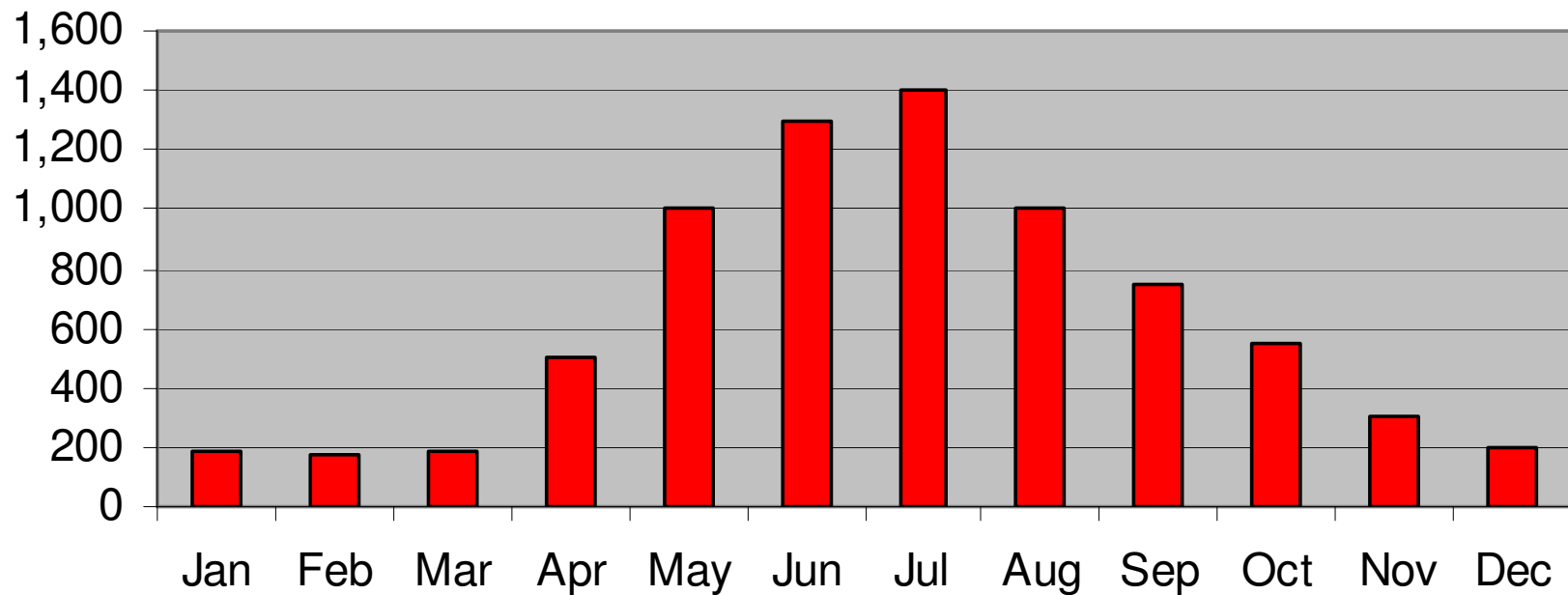
SLAVE AND ATHABASCA RIVERS

Transit as far as Fort Smith probably achievable during season of arrival. However, Athabasca flows and water depths peak in July



ATHABASCA RIVER DISCHARGES BELOW FORT MCMURRAY

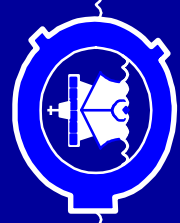
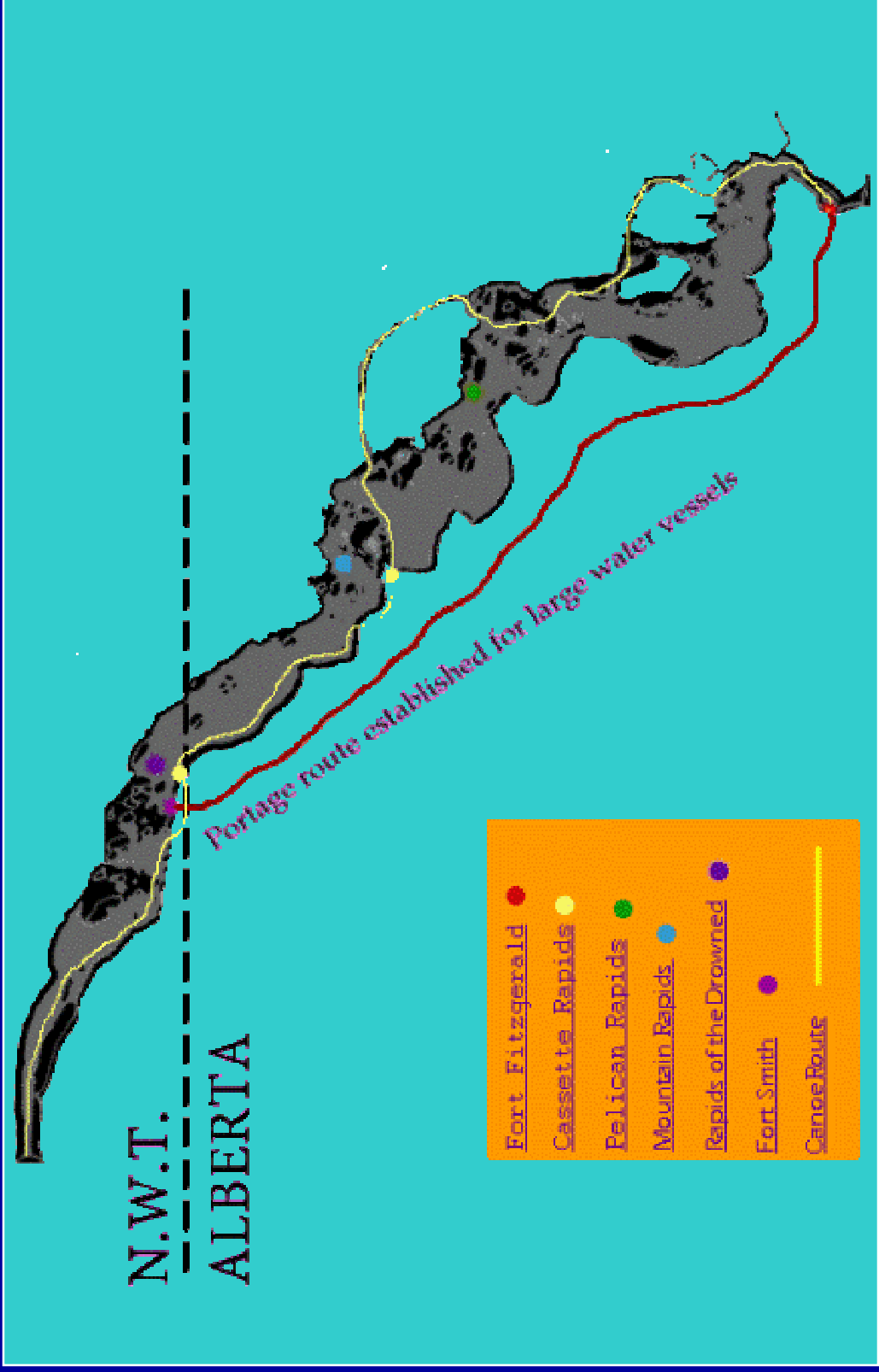
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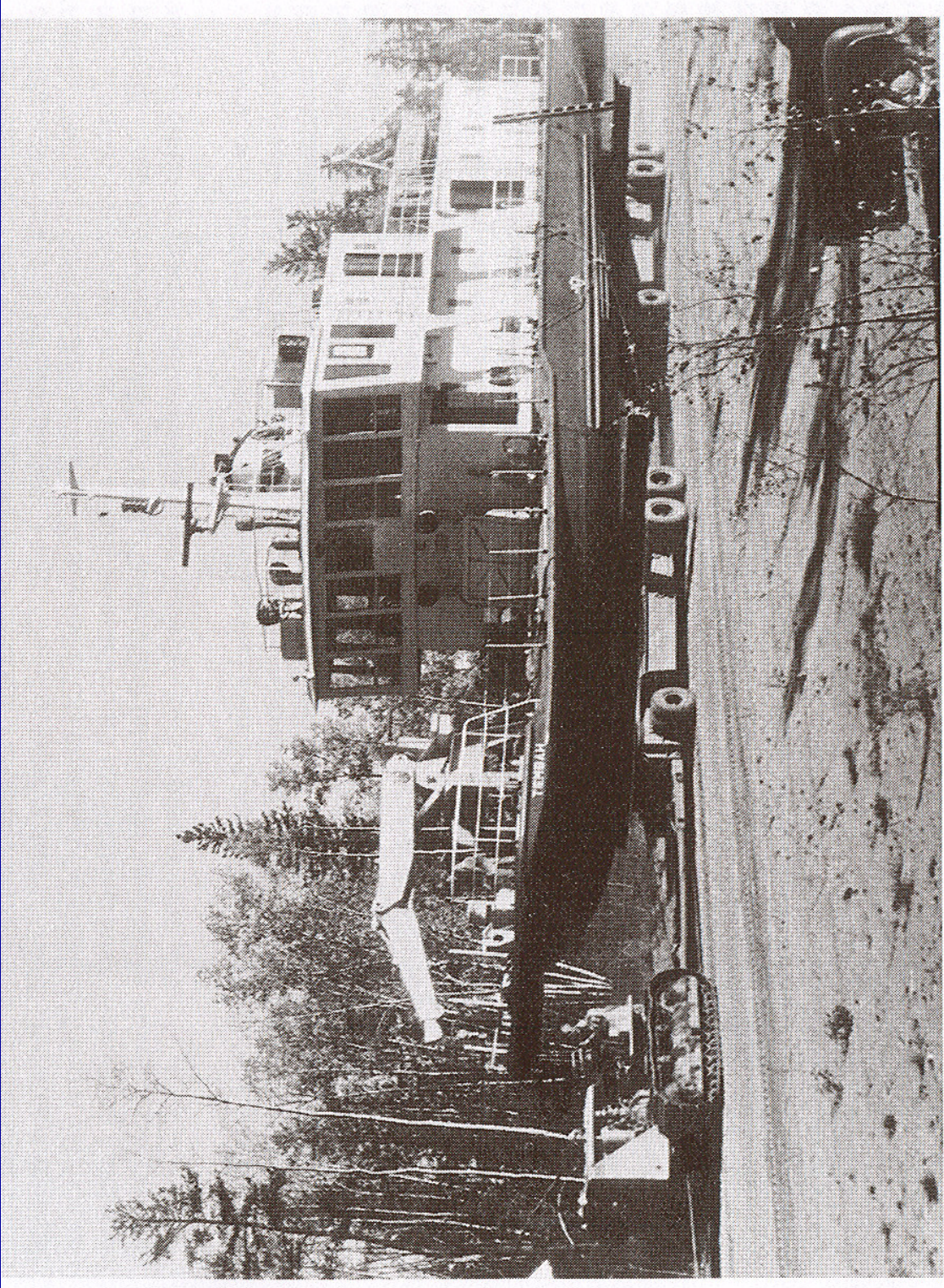


PORTAGE

Rapids between Fort Smith and Fort Fitzgerald not navigable so have to portage. May need to winter units at Fort Smith, moving them in June/July to Fort MacKay.







NWT OPPORTUNITY

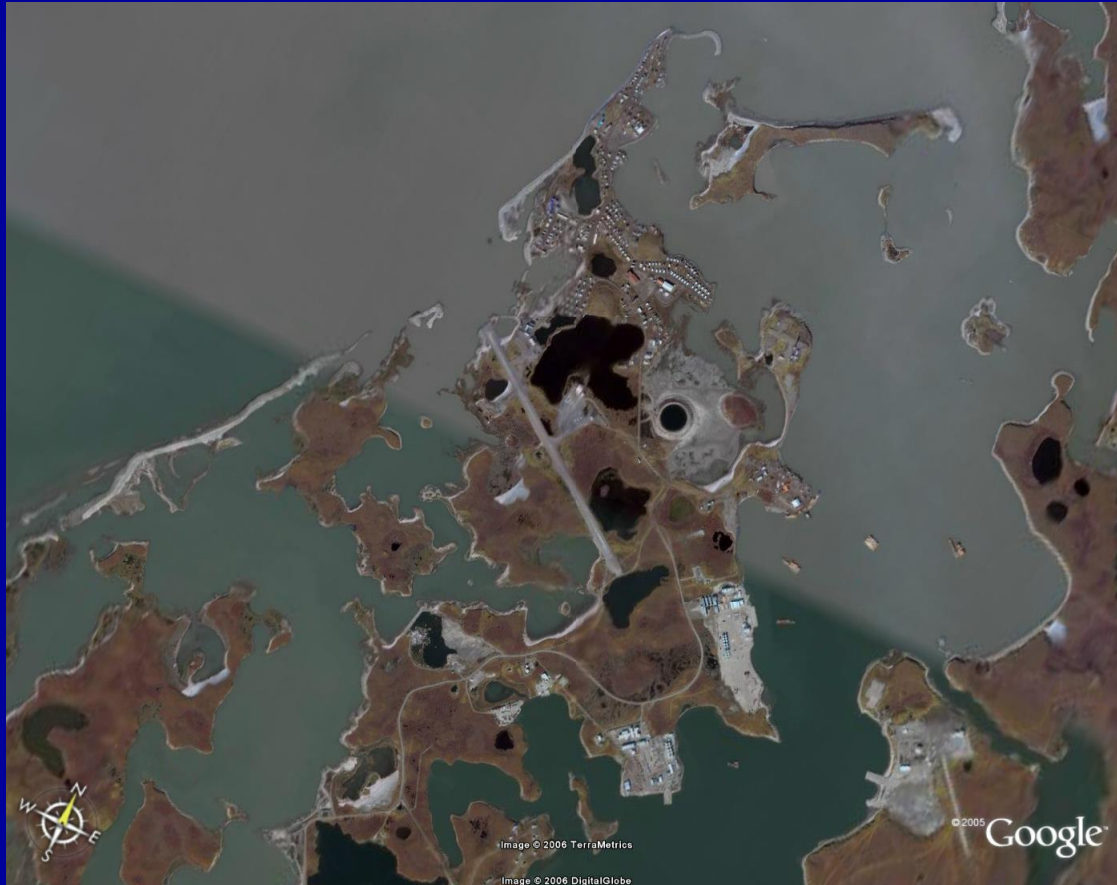
- Economic Benefit potential in Tuktoyaktuk and Fort Smith.



ARCTIC SERVICE CENTRE

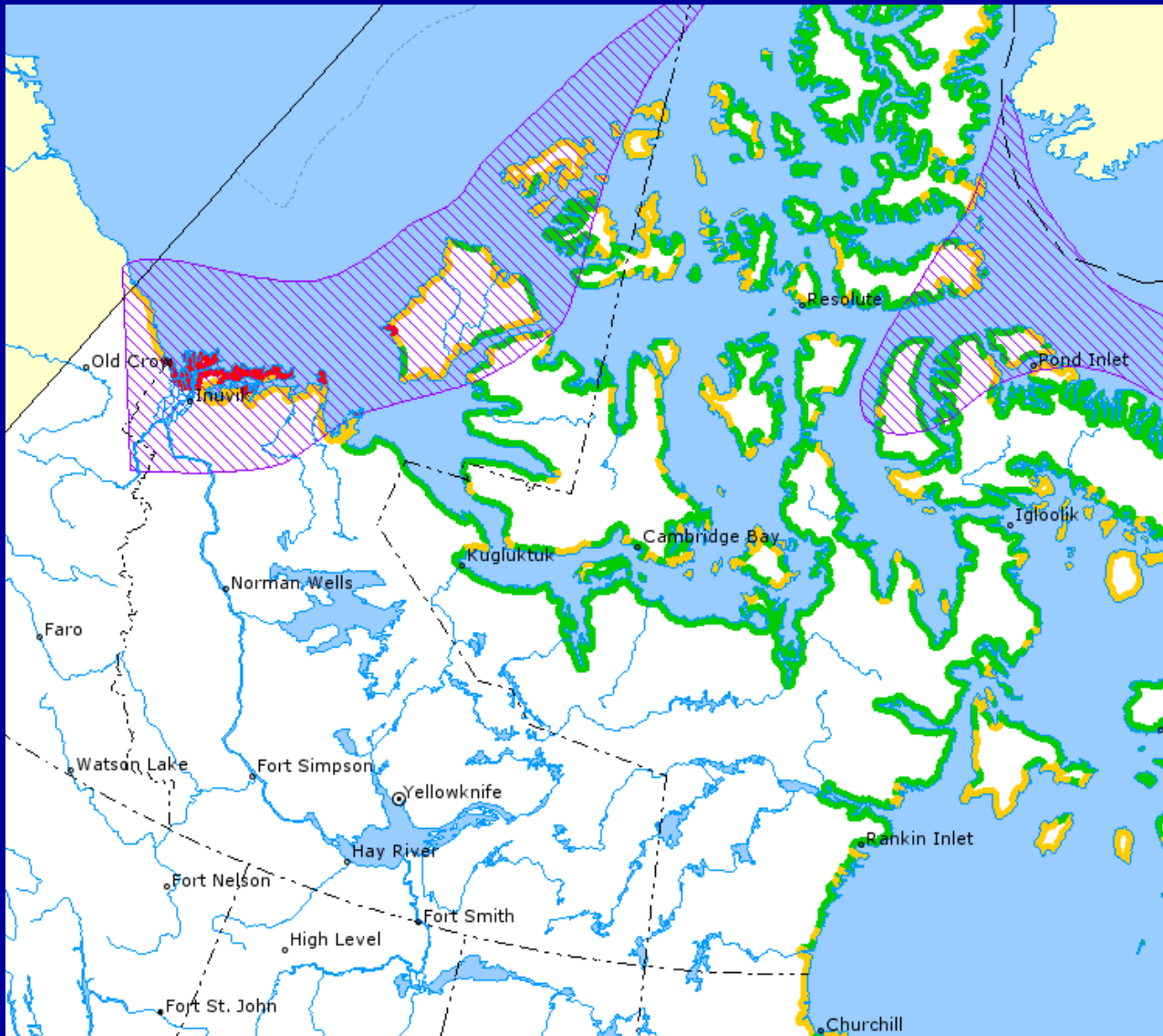
- Tuktoyaktuk very active in oil and gas exploration support mid 1970's through mid 1980's
- Could be readily re-activated infrastructure still there
- May need dredging





Tuktoyaktuk





Sinking Area in Western Arctic



FORT SMITH

- Opportunity for added value activity prior to final delivery if units wintered
- All weather road and full air service available
- Workforce capabilities present
- Head of navigation for lower Slave River





Fort Smith



FUTURE ACTION - TRAFFIC

- Need a good indication of type, size, weight, time frame and number of units that could move.
- Need data for quotes on ship and rail transportation
- Mariport would maintain confidentiality of sources in any market discussions



FUTURE ACTION- ROUTE NAVIGABILITY

- In discussion with Canadian Hydrographic Service regarding multi – client river survey
- Results may show that we are being overcautious regarding season and depths



FUTURE ACTION- SEASON LENGTH

- Investigating the availability and cost of air cushion technology to get around shallow draft above Fort Smith, and extend season



FUTURE ACTION- COMMUNICATION

- Intend to issue updates on key issues, once we have information in hand regarding quotes for transportation.
- Need to know what aspects the oil sands companies need to see addressed.



COMPANY MEETINGS

Oil Companies

Chevron, Encana, Husky, Imperial, Petrocanada, Suncor, Syneneco

Heavy Lift

Mammoet

Barge

Horizon North Logistics



DELIVERABLE AT MEETINGS

- Electronic copy of power point
- One hard copy as notes
- 30-45minutes presentation
- 45-60 minutes Q&A and discussion



RECEPTION of PRESENTATION

- Very Interested
- Most companies aware of option, but had not really thought it through.
- Issues relative to risk
- Some don't like the prospect of wintering, others can see some benefit.



OIL COMPANY REPRESENTATION

- Smallest Group two persons
- Largest group six persons
- Generally amenable to a collective approach.



ACTION ITEMS

- Navigability
- Dredging at Tuktoyaktuk
- Shipment time lines
- Risk Review
- Feed back from Heavy Lift Companies
- Response to Mariport by end May



TIME LINE

- Companies need to assess feasibility ASAP
- Need to totally change design process to use
- Early projects may not benefit
- All see route being used well beyond 2020.



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You have a tiger by the tail

