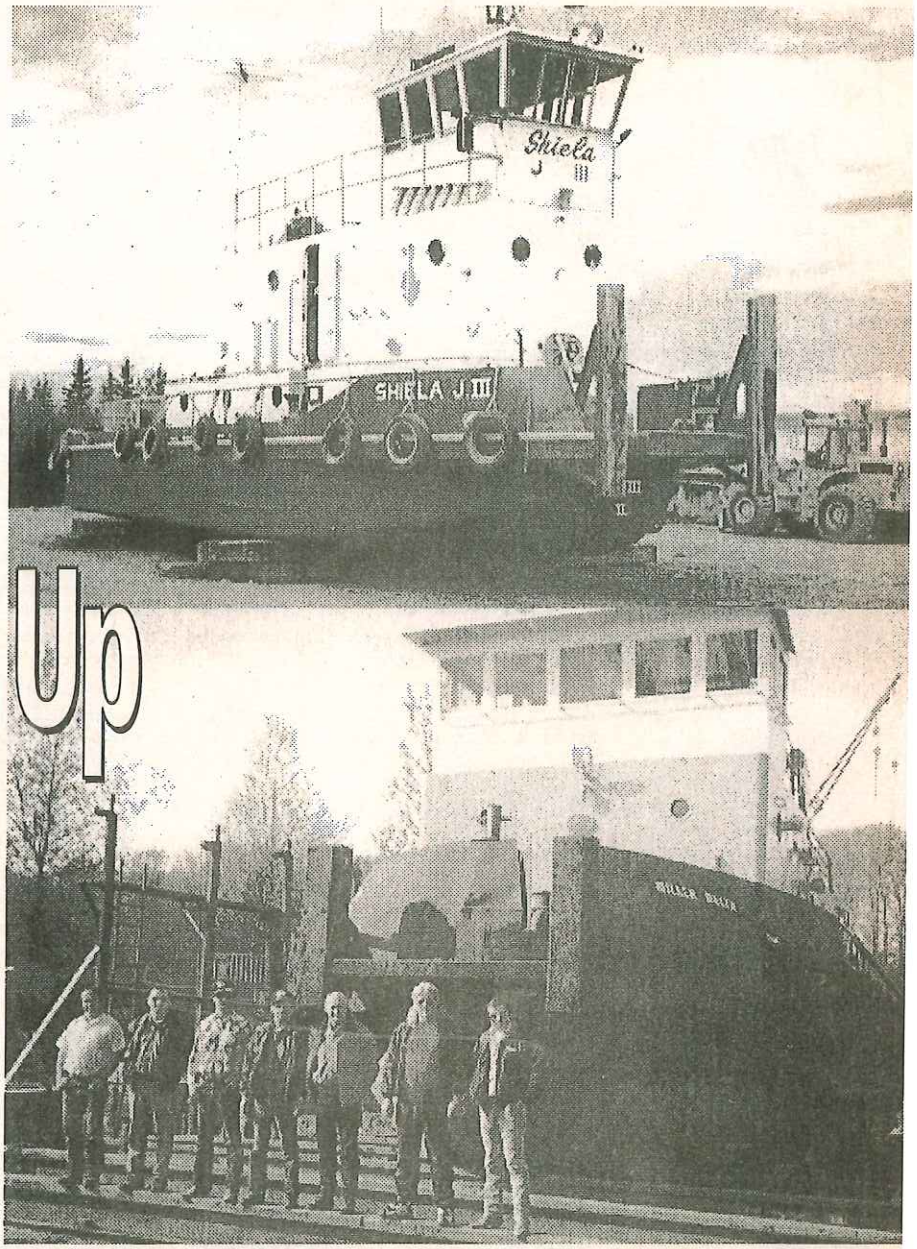


The 50x17x3-foot (maximum draft) ***Sheila J III*** *(top photo) high and dry for the winter at Cooper's Landing, was built in 1970 by Alberni Engineering and shipped north in sections. The tug has twin 400-hp Caterpillar 3408 propulsion. In the bottom photo, the* ***Miller Delta*** *is on the ways at Fraser River Shipyard in New Westminster while the tug was being purchased from Miller Contracting by Cooper Barging in 1997. Resource work in the Northwest Territories was increasing and the* ***Sheila J*** *was working overtime. The 70x25x4'6"* ***Miller Delta*** *was originally delivered in 1974 by Allied Shipbuilders to Northern Construction and has twin 725-hp Caterpillar D348 propulsion. Left to right, Jan Oskam (Miller Marine superintendent), Mike Cooper, Cam Cooper, Ed Cooper, John Mattson (Red Sky Enterprises; handled the purchase and delivery of the* ***Miller Delta*** *into the Mackenzie via the Bering Sea/Arctic Ocean route), Ken Hemeon (Miller skipper), Milton Cooper.*

From the Bottom Up

Cooper Barging Service Works the Mackenzie

by Rob Morris

TUG AND BARGING ON THE MACKENZIE RIVER AND ITS TRIBUTARIES IN Canada's Northwest Territories certainly has its challenges. They present themselves mainly in the form of some pretty powerful, and not so predictable, environmental forces which cause seasonal fluctuations in river levels and flows.

Each year sees the spring break-up of the rivers, frozen solid from November usually through to May. The breakup starts in the Liard and works its way north into the Mackenzie. A month to a month-and-a half later, the Mackenzie ice has broken up in a northerly direction as far as the river's delta on the Beaufort Sea where Inuvik is located. As the big river frees up Cooper Barging Service's transportation work on the Mackenzie and Liard Rivers commences.

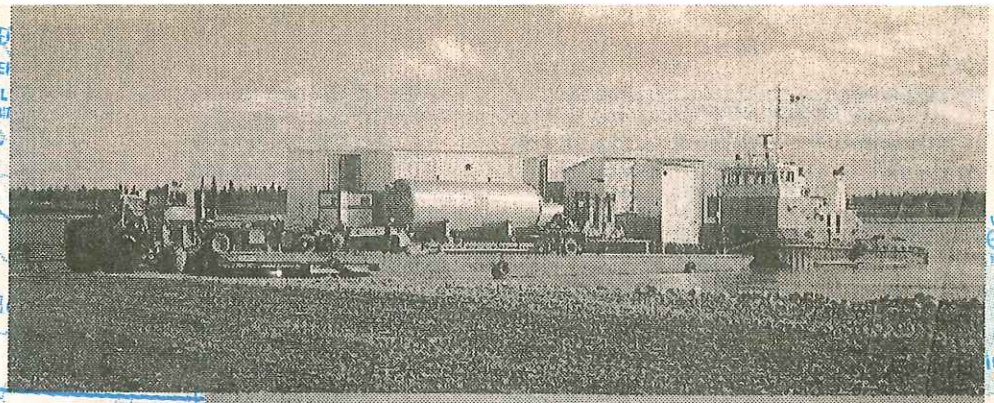
Cooper Barging Service operates out of Cooper's Landing, just south of Fort Simpson, on the Liard River where it confluences with the Mackenzie. In the spring broken ice out of the Liard will collide with the still largely ice-bound Mackenzie. High water can lift ice up onto Cooper's Landing where the company stores its tugs, barges and other equipment through the winter, necessitating some big equipment to shove the ice aside.

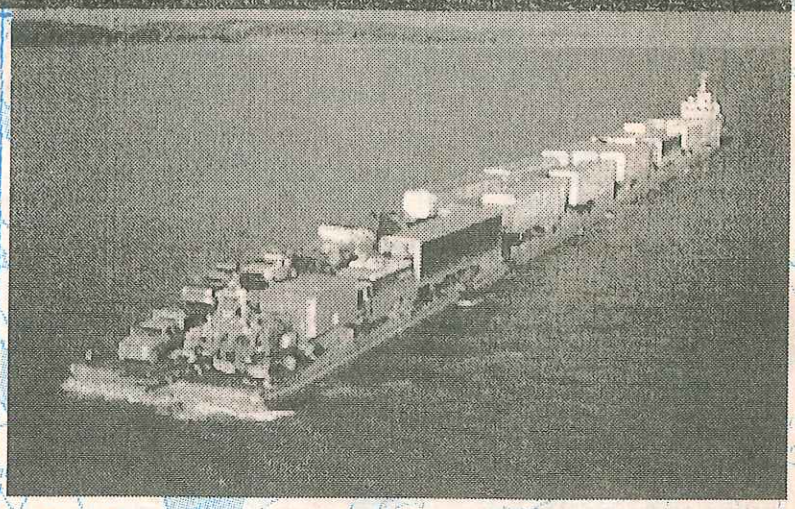
A season with high run-off suits Cooper Barging fine. The melting of a heavy snow pack followed by sustained summer rainfall will keep river levels up for the four-to-five-month navigation season. The run-off raises the level of Great Slave Lake, the source of the Mackenzie River; the lake plus the Liard River combine to feed the Mackenzie. Mike Cooper, president of Cooper Barging, recalls 1996 and '97 as having "good water" all year; '95 had low waters.

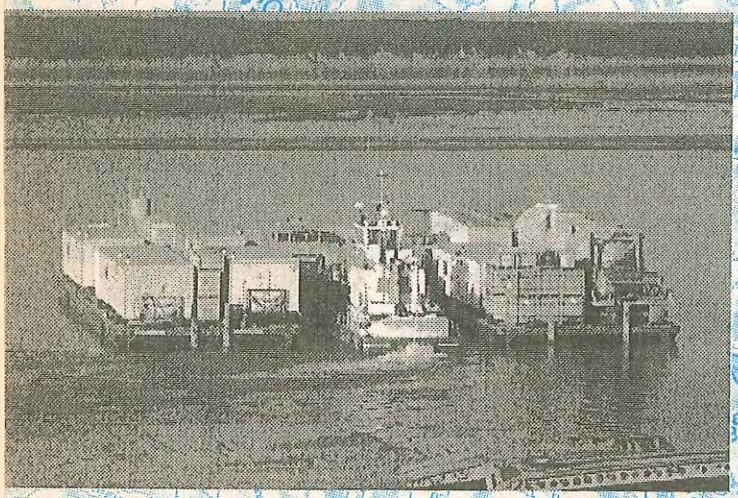
There's a trade-off for high river levels, however — more current to contend with throughout the river system. In particular, a long section of narrows, twists and turns in the Mackenzie's course south of Tulita (Fort Norman) runs at five-to-eight knots. The rest of the river would be running at an average three knots.

A low snow pack and dry summer add up to low river levels. They are at their lowest in the Fall, when maximum two-foot depths under the keel in both the Mackenzie and the Liard can be encountered by the company's tug skippers. As Mike Cooper explains the local knowledge of the skippers is all-important. The navigation channels are marked with buoys, but the channels can be both narrow and shallow and skippers "need to be right on the money in the tight turns. It's local knowledge from the bottom up." Operational adjustments are also frequent, such as lighter loads on the barges.

The river currents also demand some different tactics. Barges are always pushed, never towed. Pushing provides more control in currents and through







Map section of the Northwest Territories shows area of operation of for Cooper Barging Service.

Photos, top to bottom

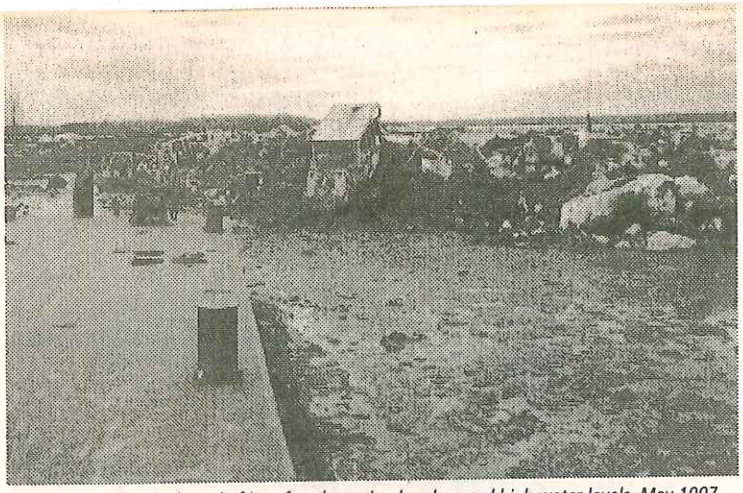
*Imperial Oil equipment modules assembled in Edmonton are offloaded by the **Miller Delta** at Goose Island, near Norman Wells. Portable steel ramps are used to load and offload from the barges.*

*The **Miller Delta** pushes four barges on the Mackenzie River. Barges are strung out in a line for less resistance in the current when pushing south, or upstream, on the Liard and the Mackenzie Rivers.*

*The **Sheila J III** departs Fort Simpson with three barges of oil drilling equipment and supplies. Barges are strapped together, as shown, for control in the current on downstream runs.*

the tight turns around the channel buoys. A tug pushing a maximum of four barges is the norm. Travelling upstream in fast water, such as the series of rapids north of Tulita, a tug may relay its barges, taking two through the rapids initially, then coming back for the other two.

Add to the ice and the fluctuating river levels (at Norman Wells the Mackenzie's water level can drop as much as 10 feet between spring and fall) northerly Arctic winds which push against the currents and build steep waves, fog and forest fires. A couple of years ago, Mike Cooper recalls, the smoke from fires hanging over the river reduced visibility to near zero.



Cooper's Landing is cleared of ice after the spring breakup and high water levels, May 1997.

The Cooper family's long association with river freighting in Canada's north started in 1942 when Edward Cooper Sr. started barging with his first tug, the **Beaver River**, on the Liard and its tributary the Fort Nelson River. Back then the tugs and barges were built in the north country of wood — they tended to have short, hard lives.

Cooper's four sons — Mike, Milton, Ed and Cam — learned the business with their father. Cooper Barging Service was incorporated at Fort Nelson in 1967. Mike Cooper heads up the tug and barge operations. Cam Cooper owns and operates the tug **Malta II** on the Liard River out of Fort Liard, leasing it to Cooper Barging. Ed and Milton Cooper manage the construction and trucking sides of the company, respectively.

The bulk of Cooper's freight is oil field equipment and supplies headed north to Norman Wells (a 355 mile run from Fort Simpson; approximately 100 miles south of the Arctic Circle) where Imperial Oil is drilling under the Mackenzie River from islands, mostly man-made. All the town's groceries, building supplies and other day-to-day needs come in by a couple of barge services. Cooper Barging runs a scheduled bi-weekly service to Norman Wells from June 1 to October 1 and will go further north as required. A winter road on the frozen muskeg is open for about six weeks, linking Norman Wells with points south for that period.

Not surprisingly the demanding environment of Arctic rivers require a breed of rugged, somewhat specialized equipment. The tugs and barges have shallow drafts. They are constructed with lighter steel plate, compared to their coastal brethren, which is supported with lots of framing, plus flat bottoms to keep drafts to a minimum. Flat bottoms also enable the vessels to be easily skidded up the beach into winter haulout. High wheelhouses identify the tugs as members of the world's pusher tug fraternity. Both tugs and barges have pusher knees, with winches on the tug foredecks used to tie the barges in.

Twin screws are tucked up in tunnels for protection in shallow water operations such as the nosing of the barges into shoaling beaches to load and offload. "The tunnels dictate that we use small props with big pitches," notes Mike Cooper. "The **Miller Delta** [a 70-foot tug acquired by Cooper Barging last year] swings a pair 49 1/2"x49 four-bladed wheels in nozzles. It's not the most efficient propulsion set-up, but we have to live with it."

With a navigation window of only several months on the rivers, everyone gears up for it. Everything that needs to go north is sitting ready for the spring break-up. Come fall, the tug and barging comes to an absolute standstill and that's the reason for the Cooper brothers' diversification into construction and trucking. The environment molds all human endeavour in the North. But, like Mike Cooper says, you learn to live with it.