INSTALLATION OF A TEMPORARY TIDE GAUGE AT MOOSONEE, ONTARIO

1974

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Regional Tidal Office
Central Region

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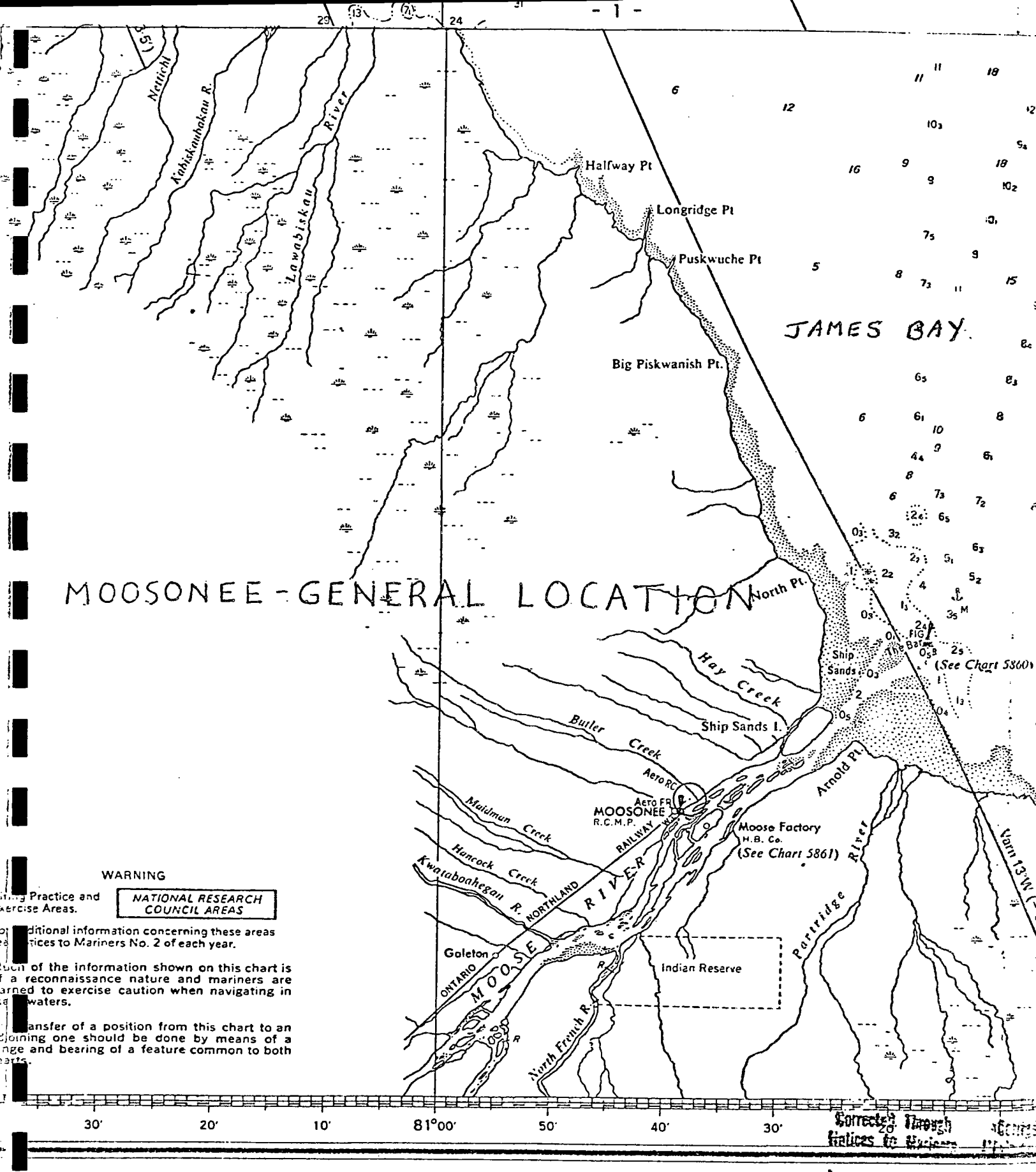


Corrected Through
Notices to Mariners

Edition

PLAN #1

Canadian Hydrographic Service
Service Hydrographique du Canada
OTTAWA, ONTARIO

BACKGROUND

A Canadian Hydrographic Survey of the Moose River was carried out in 1960 during which one float-operated tide gauge was installed at Government Wharf, Moosonee and three pressure type gauges were located at sites downstream from Moosonee. Some problem was initially encountered with silting at these downstream sites but was remedied in the latter part of the season.

The tidal levels and datums at all sites were connected to a local levelling network established by the Topographical Survey in 1960 and this local network was in turn connected to the national precise levelling network by Geodetic Survey in 1961. Chart Datum at Moosonee was thus found to be 3.336 feet below Geodetic Datum.

While the average tide at Government Wharf was found to 4.0 feet, levels of 12.6 ft. above Chart Datum and 0.1 feet below Chart Datum were observed during the hydrographic survey period. These extreme values are rare occurrences as witnessed from records taken during 1923, 1933, and 1934.

In summer months, tidal action terminates at the foot of the rapids located between Moosonee and the Kwataboahegan River. The tide takes about two and one-half hours to travel from the river's mouth to Moosonee, providing a tidal stream in the Moosonee area of approximately one knot, compared to 1.5 knots in the estuary while the currents vary from 0.2 to 0.5 knots off Moosonee to 0.8 knots in the estuary.

Excerpts from "Moose River and Approaches"
C.J. Langford, 1963

PLANNING AND PREPARATION

Planning for a temporary tide gauge installation on the Moose River was initiated as it became apparent that tidal information in Southern James Bay was needed to complement the existing data of Northern James Bay as well as provide water levels for storm surge studies.

Ship Sands Island at the mouth of the Moose River was tentatively chosen as a possible gauge site but was soon ruled out in favour of Moosonee or Moose Factory, where ease of installation and accessibility were the major determining factors.

The general location being chosen, preparation was then begun to collect available information of the area with regard to ice conditions, Bench Marks, Hydrographic Charts, current velocities and general geographic conditions.

After telephone contact had been made with personnel familiar with the area, a field trip of four to five days duration was envisioned to install and adjust the gauge and to employ a responsible gauge attendant.

OPERATIONS

On Monday, June 10th, myself and Mr. Raymond Treciokas departed for Moosonee from Toronto International Airport. Due to foul weather and trip scheduling, our arrival in Moosonee was delayed until Wednesday morning where upon our equipment was found to be intact and undamaged at the Ontario Northland Railway freight office.

After a reconnaissance of Moosonee and Moose Factory, and questioning local personnel, it was found that no permanent dock or other acceptable structure existed for standard "wharf installation". It was decided that a lumber crib would have to be constructed to house and protect the pressure recording element.

Upon further queries and shoreline investigation, a suitable site was found near a sewage lift station operated and maintained by the Ontario Ministry of Environment.

From consideration of the immediate shoreline and offshore depths, the dimensions of the crib and the quantity of materials were estimated. It was decided that a 3' x 3' crib with 3½' legs would suffice allowing for 1½' of the legs to sink into the muddy bottom. The crib would be placed approximately 180 ft. from the lift station, 60 ft. from the highwater shoreline mark, leaving us with 20 ft. of extra cable for manoeuvering purposes.

With little ado all necessary materials were obtained and construction was completed by mid-afternoon of Friday, June 14th. Low tide being predicted, a canoe and driver were employed to aid in submersing the structure. Voluntary help was also provided by Mr. Thomas Moore, a local technician, who later was employed as gauge attendant. Photographs of facilities and crib were taken as seen in "Photographs".

On Saturday, June 15th, land survey work necessary to vertically tie in the water level gauge to existing Bench Marks began. Of the five Bench Marks on record, only two were found to be undamaged. A Geodetic Survey of Canada Bench Mark was chosen as a reference Bench Mark in establishing two tide staffs, and two temporary Bench Marks near the "Gaugehouse" as shown on Plan #2.

A contract between Mr. Moore was arranged and final instructions were made concerning his duties and future correspondence.

We returned from Moosonee on June 17th, with no flight interruptions.

MISCELLANEOUS

During the course of the work at Moosonee it was discovered that the Ontario Ministry of Environment had installed a tide gauge during the summer of 1973 in Moosonee within the same building as ours. The gauge is inoperative due to damaged cable.

Contact was made with the appropriate personnel concerning this gauge upon arrival in Burlington.

CONCLUSIONS

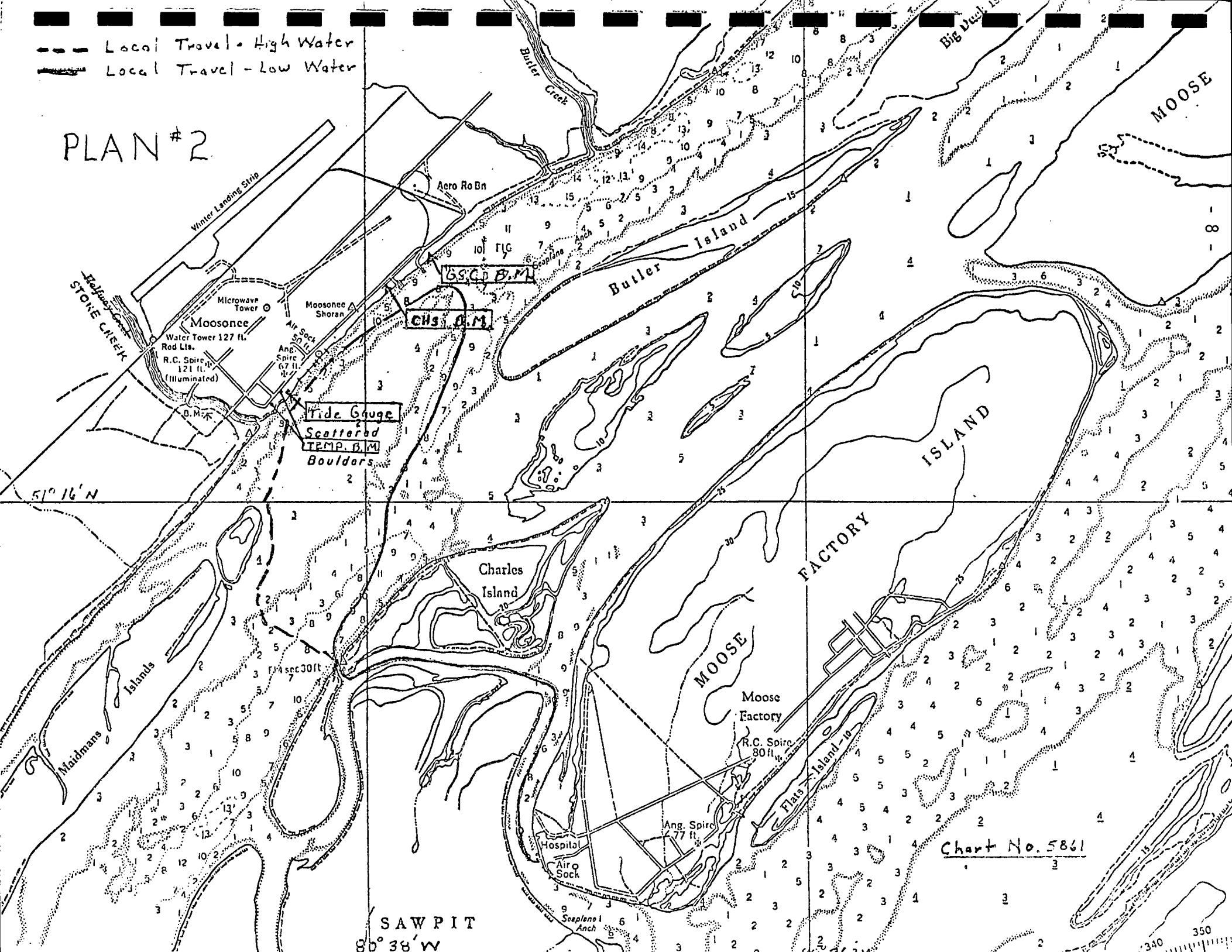
1. The Moosonee gauge should provide reliable results until "ice up" time necessitates its removal. This type of installation will not be satisfactory as a permanent gauge as discovered by the Ministry of Environment. The ice rafts up in the spring and the subsequent movement downstream broke the cable.

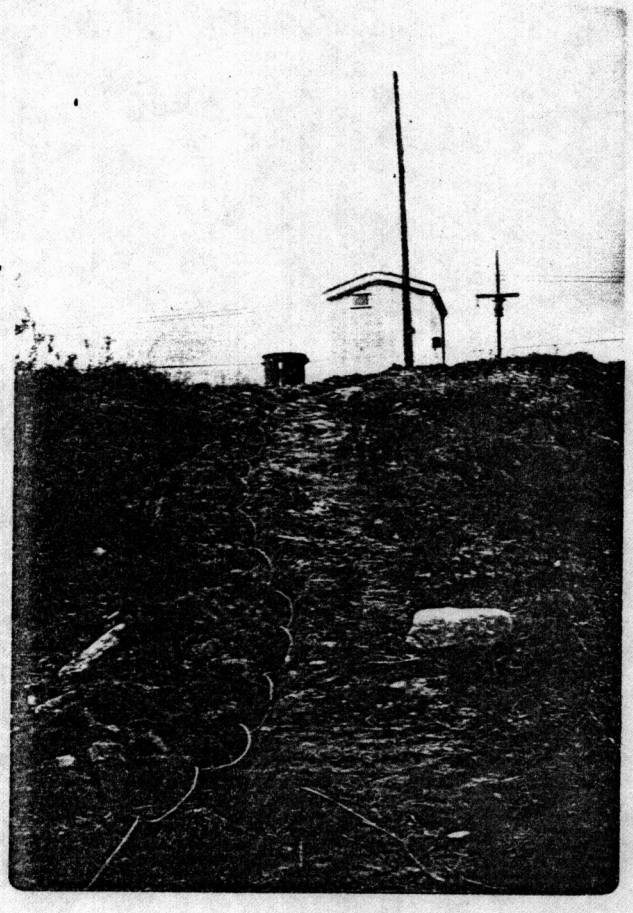
2. The possibility of using the Ministry of Environment's data should be considered.

3. The installation of two or more tide staffs is necessary to provide a factor of safety in areas where the probability of movement or damage is high.

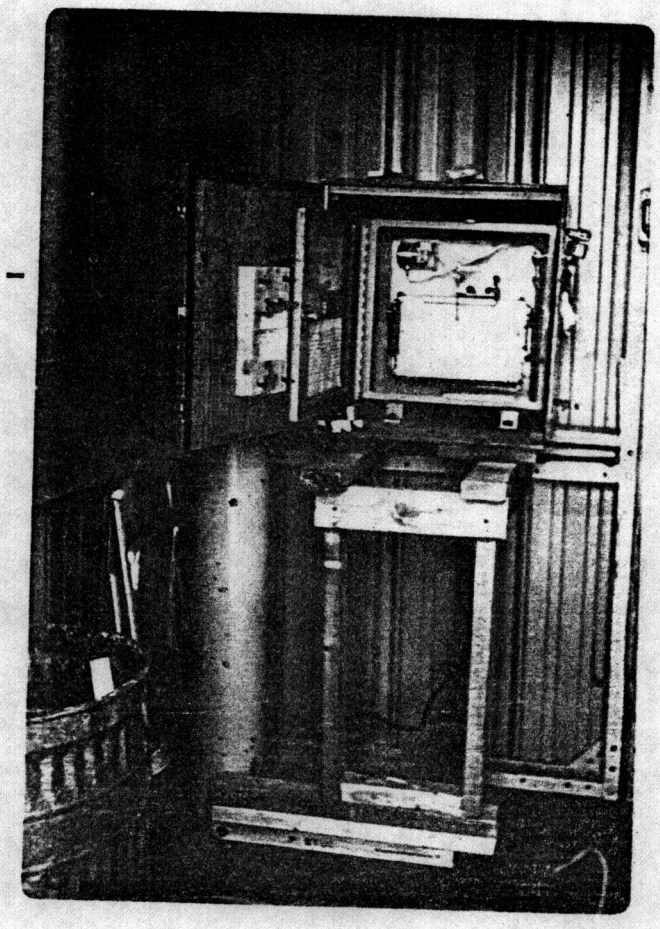
PERSONNEL CONTACTED

NAME	AGENCY	TELEPHONE
Mr. Marvin Willis	Atmospheric Environment Service Dept. of Environment Moosonee, Ontario	336-2251
Mr. Harold Smith	Superintendent of Lights Department of Transport Prescott, Ontario	925-3048
Mr. Len Budgell	Hudson's Bay Company Moosonee, Ontario	336-2225
Mr. Thomas Moore	Ministry of Environment Water and Sewage Treatment Moosonee, Ontario	336-2504
Mr. Jim Eddie	Water Resources Branch Ministry of Environment 135 St. Clair Avenue West Toronto, Ontario M4V 1P5	965-6995
Mr. Ron McCloud	Cameron Construction Moose Factory, Ontario	336-4739
	Ontario Provincial Police Moosonee, Ontario	336-2320
Rev. P. Tozer	Government Wharfanger Department of Public Works Moosonee, Ontario	336-2286
	Ontario Northland Railway Freight Office Moosonee, Ontario	336-2931
	Polar Bear Lodge Box 305 - Moosonee - Toronto	336-2345 743-6287

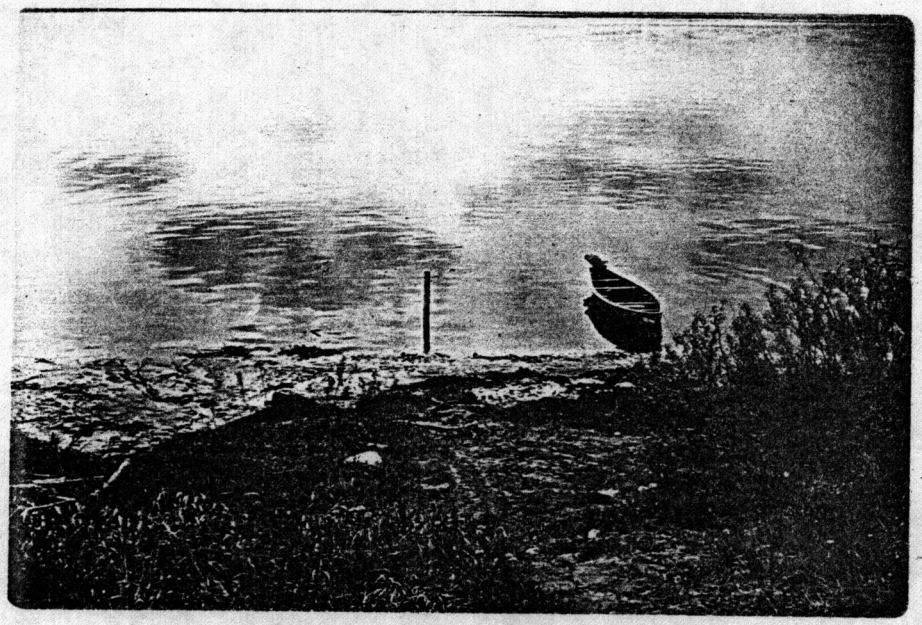

Local Travel - High Water
Local Travel - Low Water
PLAN #2
Butler Creek
Big Devil
MOOSE
Aero Ro Bn
Winter Landing Strip
Butler Island
Seaplane Anch
GSC B.M.
CHS B.M.
Microwave Tower
Moosonee
Water Tower 127 ft.
Rod Lts.
R.C. Spire 121 ft. (Illuminated)
Moosonee Shoran
Air Sock 50 ft.
Ang. Spire 67 ft.
STONE CREEK
Railway Crossing
B.M.
Tide Gauge
Scattered Boulders
TEMP. B.M.
51° 16' N
ISLAND
FACTORY
Charles Island
MOOSE
Moose Factory
R.C. Spire 80 ft.
Ang. Spire 77 ft.
Hospital
Air Sock
Flats
Island - 10
Maidmans
Islands
Fl 4 sec 30 ft
SAWPIT
80° 38' W
Seaplane Anch
Chart No. 5861
340
350



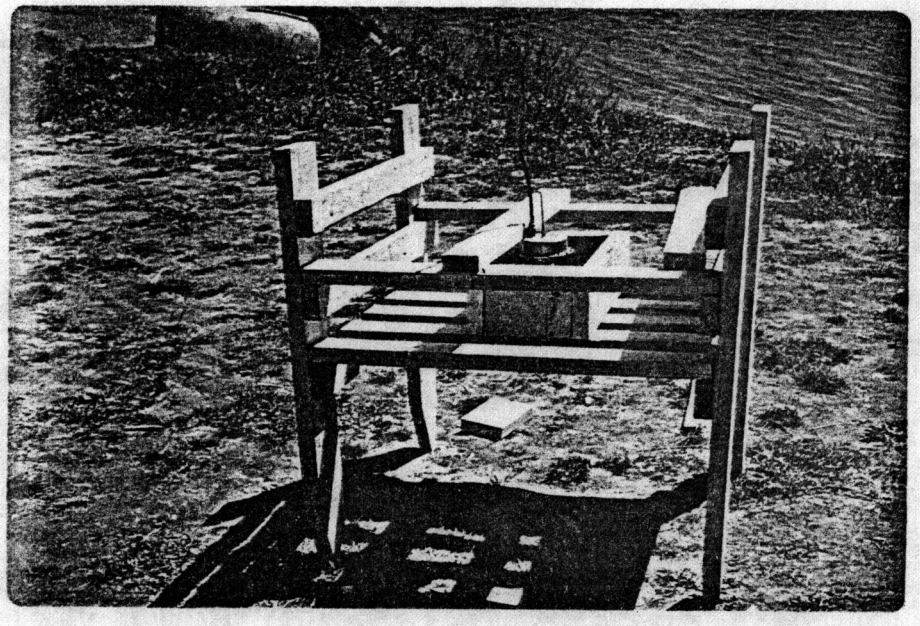
TRENCH FOR TUBING BELOW "GAUGEHOUSE"



INSTALLED OTTBORO TIDE GAUGE

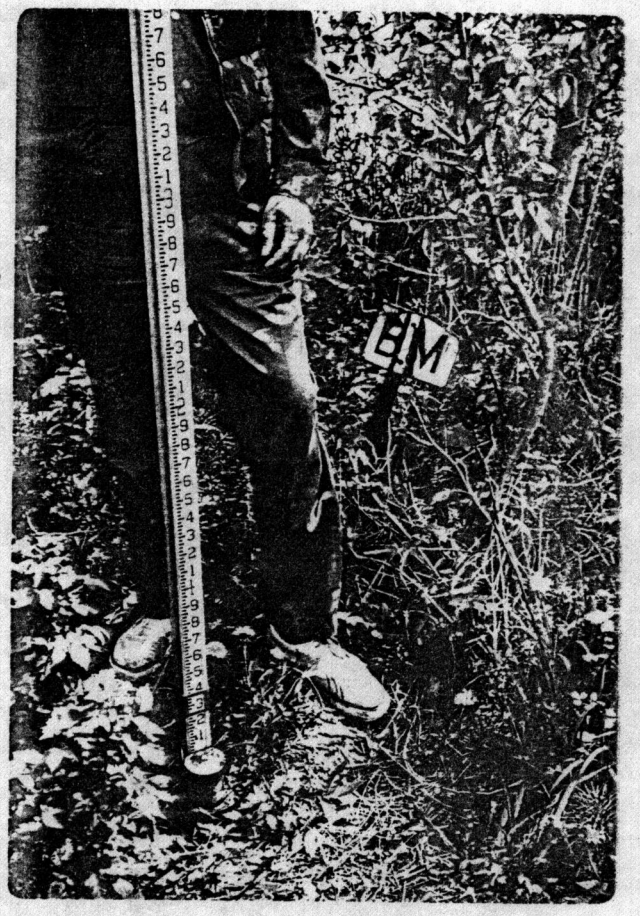


BURRIED TUBING AND TIDE STAFF



PRESSURE ELEMENT IN CRIB

SUBMERSING ROCKFILLED CRIB



REFERENCE BENCH MARK
G.S.C.

TEMPORARY BENCH MARK NO. 2