

# INVENTORY OF AGGREGATE RESOURCES

by

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## INTRODUCTION

The Inventory of Aggregate Resources in Newfoundland was begun in 1975 as part of the Surficial and Glacial Mapping Program and continued in 1976. In 1977 a separate sampling program conducted analyses in areas previously mapped surficially (Vanderveer, 1977; Grant, 1973; and Brookes, 1974). This program was supplemented in 1977 by sampling conducted by the Surficial and Glacial Mapping Program (Vanderveer and Sparkes, 1978).

The 1979 project has been a continuation of project 2.2 of The Inventory of Aggregate Resources program begun in 1978 and is funded under the Canada/Newfoundland Mineral Development Subsidiary Agreement. The program is designed to provide an inventory of aggregate (sand, gravel, crushed stone, stone, ballast) resources along existing and proposed transportation routes in Newfoundland and Labrador and will show the location, size, quality, present degree of use and potential of each deposit.

## FIELD PROGRAM

A 6 km wide corridor (Maps 1 & 2) centered and parallel to existing, proposed, or partially constructed highways and secondary roads in Newfoundland and Labrador is to be covered. Tertiary roads and trails capable of being ungraded to handle truck traffic were included in the corridor and sampling extended for a distance of 8 km along these from the main road.

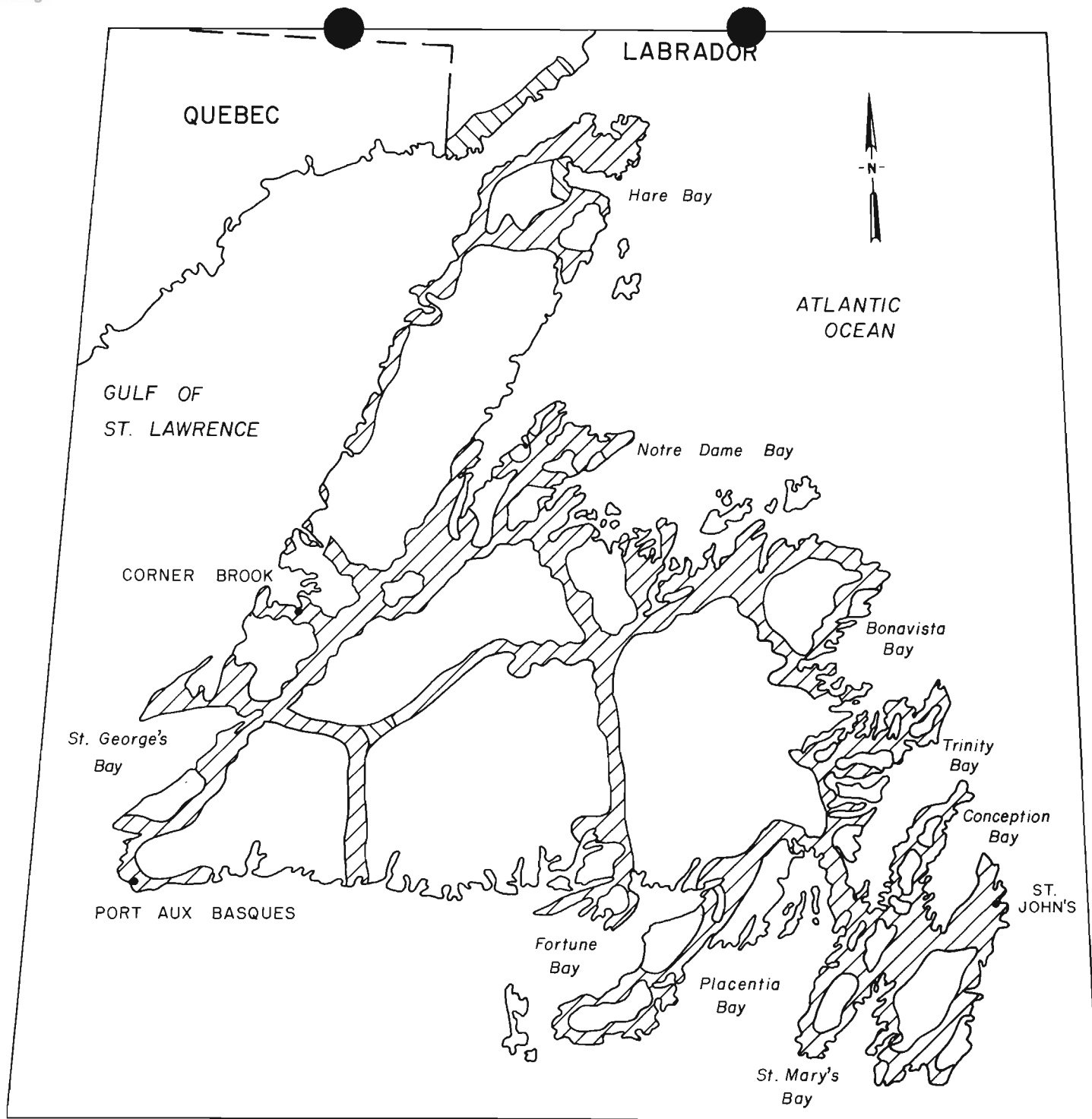
Sampling was conducted mainly by vehicular traverses, but in areas of potential aggregate resources (e.g.

glaciofluvial, fluvial, deltaic, marine or esker deposits) foot and canoe traverses were carried out. These traverses extended 3 km from the road with samples taken every 0.5 to 1 km in areas of aggregates. Additional samples were obtained where deposit changes occurred or quality differences were apparent at any given location; i.e., where products could be quarried separately. In areas lacking potential sand and/or gravel material, morainal and bedrock materials were sampled; i.e., one sample per 1 to 2 km, except where the varying nature of the deposit required additional sampling.

Generally, sample sites were limited to existing natural (stream or coastal cuts) or man made (road cuts, pits and quarry excavations, etc.) exposures. In areas of potential aggregate resources, shallow hand dug pits were made if no other exposures existed.

All field and sieve data for 1979 were placed on two separate forms. Form I gives general site information including data on location, landforms, stratigraphy, ice movement indicators, and notation for photo numbers and extra notes. Form II gives a field description of the sample, plus data on field sieve analyses, field pebble analyses and a section for laboratory sieve analyses.




Field sieve analyses were conducted on all samples containing +8 mm size material. Moisture tests were usually conducted on every second or third sample if the deposit remained consistent along the traverse route; otherwise, analyses were done at every sample location. During sieve analyses approximately 10 to 20 kg of material was sampled, weighed and sieved through

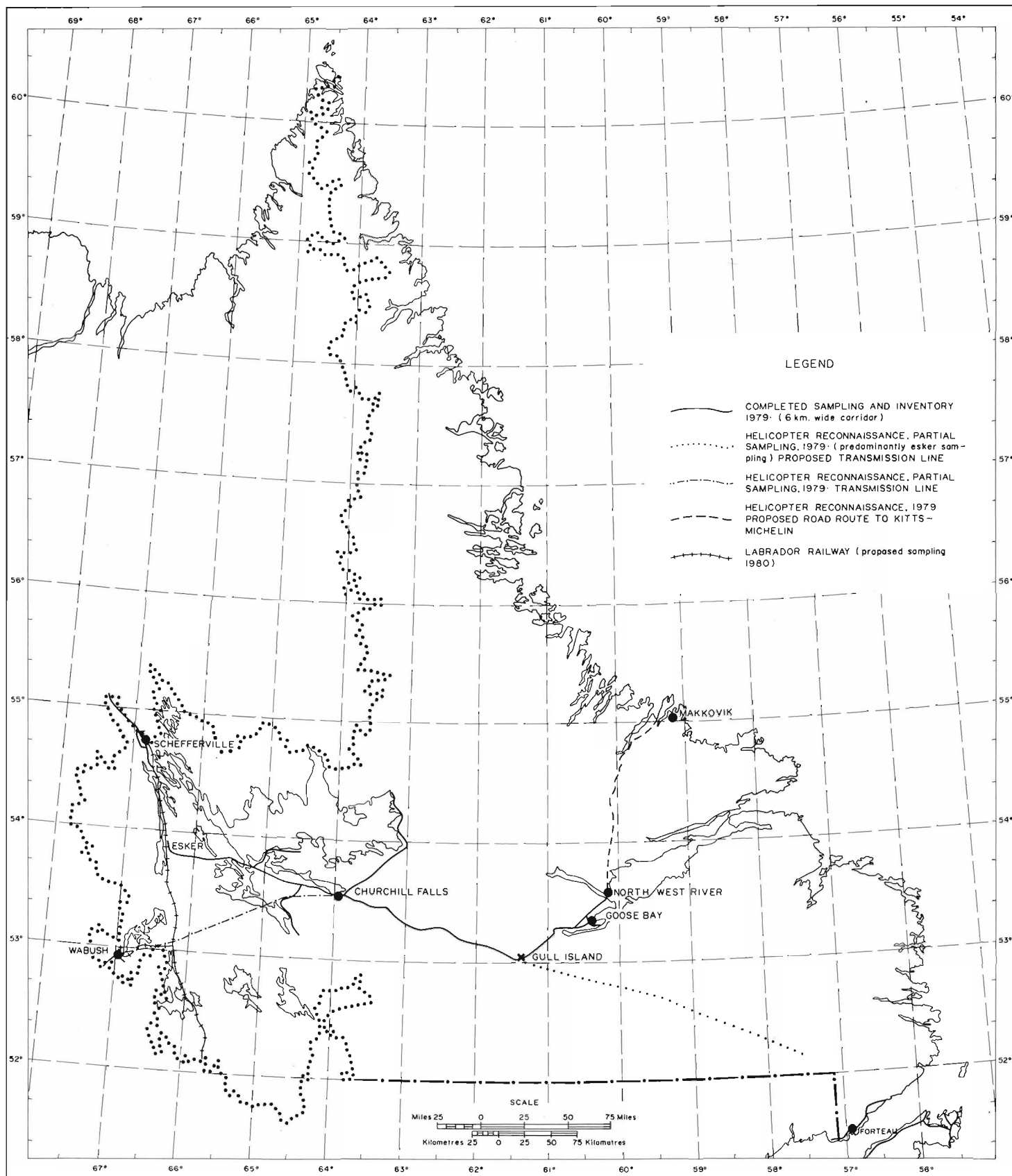


MAP 1

Inventory of Aggregate Resources Program  
Island of Newfoundland  
CANADA/NEWFOUNDLAND MINERAL DEVELOPMENT SUBSIDIARY AGREEMENT  
SUBPROJECT 2.2

Legend

-  completed 6 km wide corridor sampling parallel to existing roads and highways
-  areas of incomplete survey at data of map compilation
-  unsurveyed areas include Gros Morne and Terra Nova National Parks



a bank of four, 30 cm diameter sieves (sizes 63 mm, 31.5 mm, 16 mm and 8 mm). The total sample weight and the weights retained on each field sieve and canvas were recorded on Form II. A 200-500 gm split of the -8 mm sand-silt/clay fraction was retained for laboratory sieve analyses. If a sample had a high silt-clay content and/or a high moisture content, it was wet sieved; *i.e.*, washed through the bank of sieves. The -8 mm size fraction for laboratory analyses was then taken from the exposure site. A split (100-200 pebbles) of the +16 mm retained pebble fraction of each sieved sample was saved for the field pebble lithological study. A bulk sample (500-1000 gm, minus any larger stones) was taken and returned to the laboratory for sieve analyses when sieve analyses were not conducted in the field. All samples were taken from fresh unweathered exposures and from below the normal soil horizon wherever possible. Where exposures permitted, channel sampling or multiple spot sampling was used to ensure a representative sample. More than one sample were collected from sites where different grades or types of material were encountered that might be exploited or excavated separately.

A reference collection of bedrock samples was compiled during the field traverses for each study area as an aid to the pebble lithology investigations. The pebble lithologic studies included information on the silt/clay coating, weathering, staining, sphericity, rounding, fracturing, mineralogy and texture for the various lithologies present in the pebble samples.

In addition to the above-mentioned sampling procedures, a more detailed experimental sampling project was carried out on a gravel deposit in the Butt's Pond area, about 25 km east of Gander. This project was designed to assess the feasibility of such projects in areas where the nature of the terrain or deposit characteristics would yield inadequate data if normal sampling procedures were used.

Samples for this project were taken at about 250 m intervals, to more accurately delineate horizontal and vertical depositional changes. A backhoe was used extensively in order to define the characteristics of the deposit. Depths reached with the backhoe were normally 2.7 to 3.2 m.

In addition to the road mapping, a series of helicopter reconnaissance programs were conducted in Labrador in July and August. The areas covered were: (a) proposed transmission line (Techmont Consultants Ltd.) route from Gull Island-Muskrat Falls to Forteau, (b) the Churchill Falls to Wabush transmission line route, (c) the proposed road route from North West River to Kitts-Michelin sites (Makkovik area). See Map 2. These areas were only partially sampled, the main objective being to provide logistical data for planning the routes and type of sampling program needed in 1980/81 for completion of Aggregate Resources Inventory in these regions.

#### LABORATORY PROGRAM

The laboratory program consists of sieve analyses of the sand-silt/clay fraction of each sample returned from the field. These analyses consisted of drying and splitting the sample to a manageable size (70 to 140 gm); then sieving through a bank of seven sieves (4 mm, 2 mm, 1 mm, 0.5 mm, 0.25 mm, 0.125 mm and 0.062 mm) for each sample of gravel or sand, *i.e.* samples not containing much silt and/or clay material. The weights retained on each sieve and in the pan were recorded on Form II.

Glacial tills and other samples of a high silt and/or clay content were treated as follows: 1) the sample was dried and split to 70 to 140 gm; 2) deflocculated using a few drops of a dilute solution of hydrogen peroxide (3 percent  $H_2O_2$ ); 3) wet sieved through the 0.062 mm sieve; 4) the plus 0.062 mm sand fraction was dried and sieved, and

the data recorded as with sand and gravel samples and; 5) the minus 0.062 mm fraction (water and silt and clay) was flocculated and settled by adding a small amount of magnesium chloride (1N  $MgCl_2$ ), the excess water removed and the resultant silt-clay mixture dried, weighed and this data recorded on Form II also.

The sample and site number, N.T.S. map number, the percents gravel, sand, and silt-clay, and the moisture content were recorded and a particle size cumulative curve and a histogram will be plotted for each sample. All field and laboratory data will be stored on computer for ease of retrieval.

Pebble lithology studies conducted in 1979 consisted of a review of the geological literature of each study area, the selection of a reference collection of rock specimens for each study area, and the determination of the percentage of each rock type found in each sample of pebbles. A brief report will be written concerning this study for each area investigated.

### RESULTS

During the 1979 field season 3039 samples were collected. The breakdown of these samples was as follows: tills - 884, gravels - 1058, sands - 745, silt - 46, clay - 68, rock - 236, and organics (including peat, shells and fossils) - 2.

The samples were collected from the following map areas: Eastern Newfoundland (1N/6 & 7, 2C/12-13, 2D/1, 2D/3-6, 2D/8-9, 2D/12-16, 2E/1-4, 2E/6-8, 2E/10-11, 2F/4-6, 11P/8-9); Western Newfoundland (110/11, 110/14-15, 11P/12-13, 12A/4-6, 12A/10-11, 12A/13, 12A/15-16, 12B/2-3, 12B/6-11, 12B/15-16, 12G/1, 12G/4, 12H/4); Labrador (13B/1, 13B/6-7, 13B/10-11, 13B/12, 13B/15, 13C/9, 13C/14-16, 13E/1, 13E/5-8, 13E/11-15, 13F/1-4, 13F/7-9, 23G/1-2, 23G/16, 23H/4-7, 23H/9-11, 23H/13-15).

Field pebble lithology studies were conducted on approximately 1660 pebble samples collected during 1979.

Sampling and sieve analyses in years previous to 1977 (Vanderveer, 1976, 1977) have contributed additional data on a number of areas, *i.e.*, Avalon Isthmus (1N/5, 1M/7, 1N/12-13, 1M/16, 2C/4), Wesleyville-Carmanville (2E/8, 2F/4-6), Deer Lake-Harry's River (12A/13, 12B/9, 12B/16, 12H/3) areas and the Forteau and Goose Bay areas, Labrador. Some of this data is available through open file releases 958 (Burin Peninsula), 959 (Southwest Newfoundland), 960 (Avalon Isthmus area) and the rest is available upon request.

Analyses of the 1977 data (Vanderveer and Kirby, 1978) has been completed and is available upon request. Areas covered in 1977 included: St. John's (1N/10), Holyrood (1N/6), Burin Peninsula (1L/13-14, 1M/3-4), southwest Newfoundland (12B/2, 12B/7-8, 110/10-11, 110/14-15), Stephenville-Port au Port (12B/6, 12B/10-11, 12B/15), Great Northern Peninsula (12H/5-6, 12H/12-13, 12I/4-6, 12I/11, 12I/14), and Southern Labrador (12P/6-7, 12P/9-11).

Analyses of the 1978 field data (Vanderveer, et. al., 1979) has been completed and is available upon request. The areas covered in 1978 included: Southern Avalon Peninsula (1N/2-4, 1K/11-15), Harbour Grace-Bay de Verde (1N/11, 1N/14, 2C/2-3), Isthmus of Avalon (1N/5, 1N/12-13, 1M/16, 2C/4), Burin Peninsula (1L/13-14, 1M/3-4, 1M/6-7, 1M/10, 1M/16), Bonavista Peninsula (2C/5-6, 2C/11-12), Grand Falls to Deer Lake area (2D/13, 2E/5, 2E/12-13, 12A/9-10, 12A/15-16, 12G/8, 12H/1-12, 12H/15, 12H/16), Great Northern Peninsula (2L/13, 2M/5, 2M/11-12, 12H/13, 12I/4-6, 12I/9, 12I/11, 12I/14-16, 12P/1-3, 12P/7-9). All data collected in 1978 will be incorporated into the 1979 data file.

INDEX OF NEWFOUNDLAND 1:50,000\* SURFICIAL MAPPING

Open File releases:

1. Newfoundland Department of Mines and Energy
2. Geological Survey of Canada +

In preparation:

3. Newfoundland Department of Mines and Energy - Preliminary copies available upon request\*\*
4. Geological Survey of Canada; D. R. Grant - Maps of 12A; Preliminary copies available upon request\*\*\*
5. Newfoundland Department of Mines and Energy - 1978 maps preparation++
6. Newfoundland Department of Mines and Energy - 1979 maps in preparation++
7. Proposed mapping in 1980/81

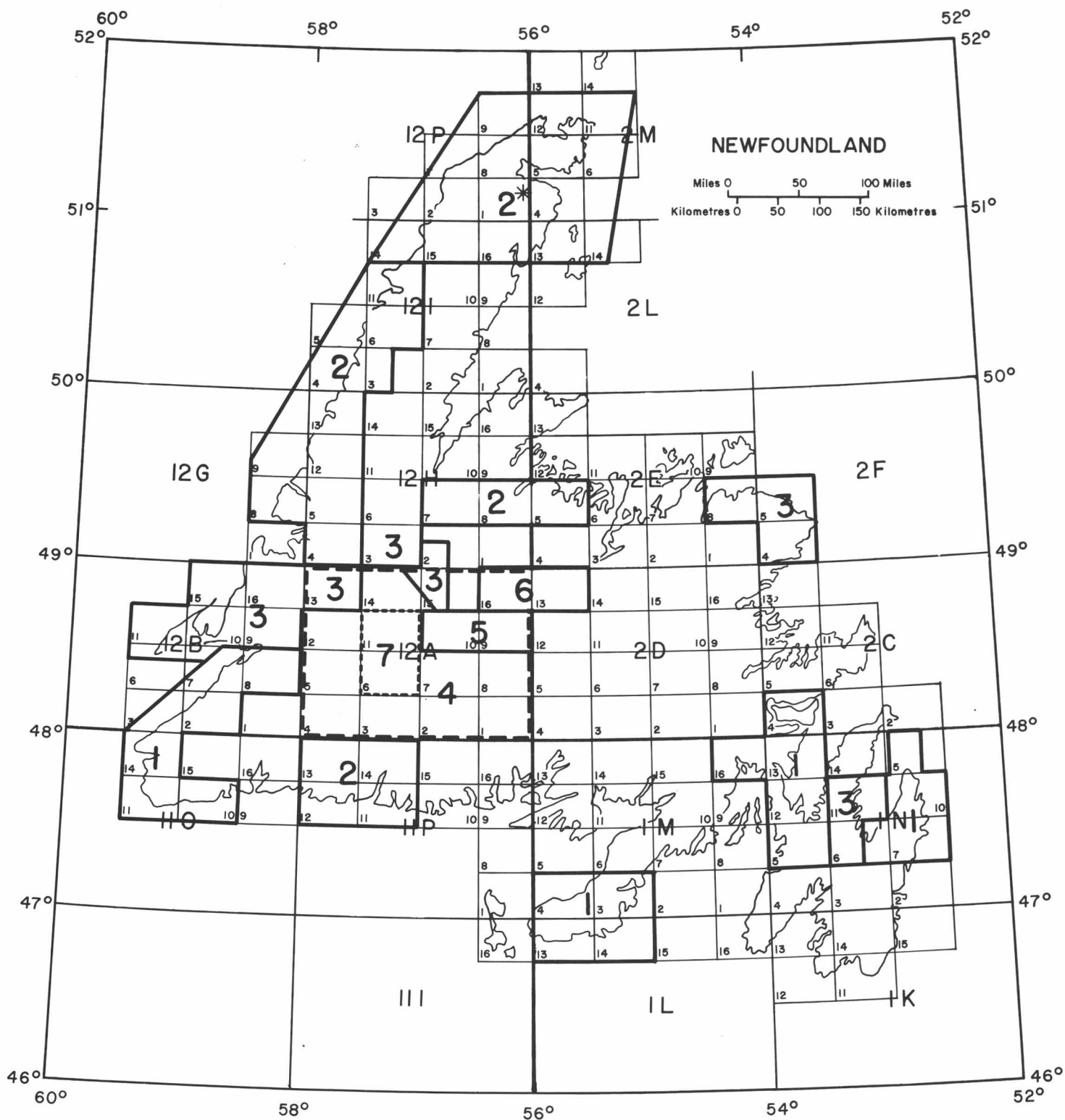
\*Scale of St. Anthony - Blanc Sablon Area, 1:100,000

+Available from Publications and Information Section, Newfoundland, Department of Mines and Energy

\*\*Available from Environmental Geology Section (D. G. Vanderveer), Newfoundland Department of Mines and Energy

\*\*\*Some preliminary maps are on file with the Environmental Geology Section (D. G. Vanderveer)

++For status, contact Environmental Geology Section (D. G. Vanderveer)



Data from the 1979 program will be released as it becomes available. An outline of potential areas of aggregate materials and the locations of all samples will be plotted on 1:250,000 topographic base maps for open file release. These data will also be recorded on 1:50,000 base maps for release upon request.

When the laboratory analyses program is completed on the samples collected during 1979, data will be available for 7308 samples collected since 1975, and covering most of Insular Newfoundland, and the road system of Labrador.

# ACKNOWLEDGEMENTS

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