

LEGEND

- |                                   |  |   |  |
|-----------------------------------|--|---|--|
| PROTEROZOIC<br>(LATE PRECAMBRIAN) |  | 9 | Diabase  |
|                                   |  | 8 | Granite, syenite and allied rocks  |
|                                   |  | 6 | Arkose, quartzite  |
|                                   |  | 5 | Conglomerate   |
| ARCHEAN<br>(EARLY PRECAMBRIAN)    |  | 4 | Granite, granodiorite and allied rocks   |
|                                   |  | 2 | Andesite, dacite and rhyolite, tuff. (Dykes and sills of granite in places form as much as one quarter of the area)  |
|                                   |  | 1 | Slate, argillite, greywacke, arkose, and conglomerate, phyllite, quartzite and schist, some volcanic rocks. (Dykes and sills of granite in places form as much as one quarter of the area) |

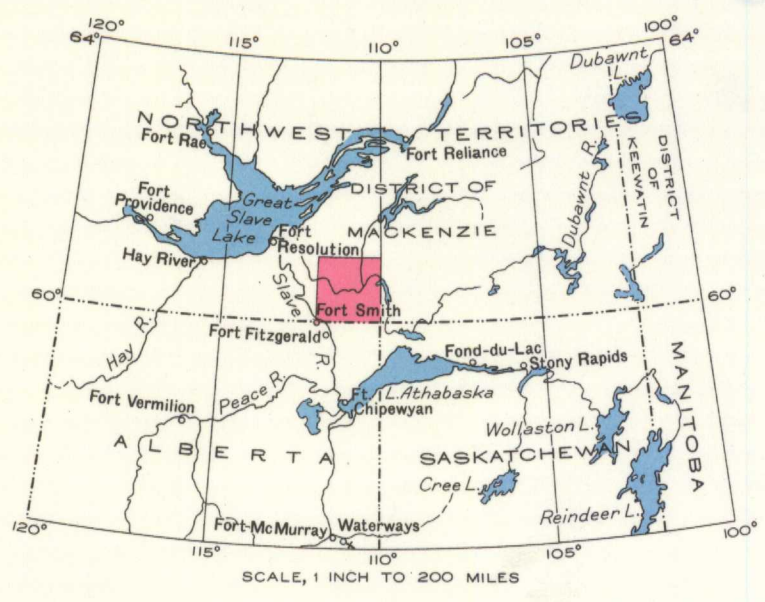
7 Grey to pink granite, granodiorite, syenite and allied rocks, in part porphyritic and foliated, age relative to Nonacho series unknown

3 Granitic rocks (forming one quarter or more of the whole) and altered sedimentary and volcanic rocks (mainly gneiss and schist)

- Quartz veins
- Heavily drift-covered area
- Observed individual rock outcrop or area of outcrop
- Fault
- Glacial striae
- Road well travelled
- Trail or portage
- Interprovincial boundary
- Stream (position approximate)
- Fall and rapid
- Marsh
- Sand bar
- Height in feet above Mean sea-level

Geology by J. T. Wilson, 1938.

Base-map compiled by the Topographical Survey, 1938, from aerial photographs taken by the Royal Canadian Air Force, June and July, 1935. Cartography by the Drafting and Reproducing Division, 1940.



DESCRIPTIVE NOTES

Fort Smith is readily accessible, in summer, by boat from Waterways and, at almost any time, by air from Edmonton. It is, however, separated from the rest of the area by a belt of swamp, 10 to 15 miles wide, east of Slave river across which there is no direct surface route. The common water route through the area leads from Fort Fitzgerald up Dog river to Leland lake and thence across Hanging Ice, Star and Berens lakes to Taltson river. At Lady Grey lake portages lead from the river to Thekulthili and Nonacho lakes. From Great Slave lake, Taltson river may be followed to the mouth of Tethul river which provides a good route across the area. The southwest corner of the area is covered by a thick deposit of silt, sand and clay and is flat and swampy. Elsewhere the area is rocky and uneven but includes no hills as much as 300 feet high. Eastward from Tsu lake the surface rises at an average rate of seven feet to the mile and all crossing streams have many rapids and falls.

The area is wooded but much of it has been burnt over within recent years. Except in a few protected hollows, where clumps of spruce may attain a diameter of 20 inches, the trees are stunted. The only other common trees are jack-pine, birch and poplar.

The oldest formations, those of the Tazin group, occupy relatively small areas and are surrounded by granitic intrusives. All gradations exist from comparatively unaltered Tazin rocks, through mixed rocks and paragneisses cut by many granitic dykes and sills, to granitoid gneisses and foliated granites.

Comparatively unaltered Tazin sediments occur near the centres of the larger areas of these rocks. The smaller bodies and the marginal parts of the larger bodies consist mainly of quartzite, altered greywacke, phyllite, schist and paragneiss and are associated with intrusions of pegmatites and dykes and sills of granite. Conglomerate was observed at the head of a deep bay that stretches towards Allan lake from Tazin river below Soulier lake, and between Allan and Yatsoro lakes. It contains well rounded pebbles of several varieties of granite, felsite and vein quartz in a green schistose matrix. The rock breaks across pebbles and matrix alike, in contrast to the younger Nonacho conglomerate.

Tazin volcanic rocks (2) are least altered on the islands and shores of High Level lake and consist of fine grained andesite, dacite and rhyolite flows with some interbedded tufts. Green to grey andesite is most abundant. The more acidic rocks grade from light grey and green to chocolate-brown and salmon-pink.

Large areas are occupied by gneisses and schists which may represent highly altered members of the Tazin group. These rocks are cut by dykes and sills of granite, felsite, quartzite and vein quartz in a green arkosic matrix with granitic material to the extent of 25 per cent or more of their volume. This mixed assemblage (3) habitually shows rapid changes from outcrop to outcrop but, as a whole, represents all gradations to granitic rocks. It includes foliated rocks in which dark schistose bands, probably mainly of sedimentary origin, alternate with light bands of granitic appearance and composition. The schists are rich in biotite, hornblende or chlorite and, in places, garnet. Other rock types include well-foliated granites containing abundant parallel inclusions of schist, and dark, massive, highly contaminated granites and diorites.

The Nonacho rocks consist mainly of conglomerate and arkose. The conglomerate (5) is composed of well rounded and densely packed pebbles of granite, felsite, quartzite and vein quartz in a green arkosic matrix which breaks round the pebbles. The arkose (6) is light purple, green, grey or buff, impure and arenaceous. Both it and the conglomerate are slightly sheared in places. The series is exposed more extensively in the adjoining, Taltson Lake, and Nonacho Lake areas to the north. The strata are relatively unaltered and, structurally, appear to be much less deformed than those of the older, Tazin group.

The granitic rocks of the area were intruded during at least two periods, for, at the west end of Thekulthili lake, north of the map-area, granite (8) cuts the rocks of the Nonacho series, but at the east end of the lake and on Hill Island lake, to the east of the map-area, granite (4) underlies and is older than Nonacho sediments. Intrusive contacts with the Nonacho series are comparatively narrow and well defined and the strata are but little altered in contrast to those of the Tazin group in contact with pre-Nonacho granite. Except, however, where Nonacho beds are present it was not possible to distinguish granitic rocks of different ages and for much of the area no separation was attempted (7). The abundance of Tazin inclusions throughout most of the wide areas of granitic rocks and their wide, gradational contacts suggest that pre-Nonacho granitic intrusions are the more widespread in this map-area. No diabase dykes (9) were seen in the southern third of the area. In the northern part, where they are most numerous, nearly all strike north-westerly and are parallel to or follow long, straight valleys. Most of them are not long but one was traced for seven miles along the valley of Nelson creek below Nelson lake. In several places these dykes were found to split into two or more parallel dykes. One such dyke is 125 feet wide at the north end of Nelson lake. A mile to the northwest it appears to split into not less than 24 subsidiary dykes ranging up to 10 feet wide.

Quartz veins are common throughout the area. They are of several types and at a few localities it was possible to prove they were of different ages. At the extreme northeastern corner of the area, where the Nonacho series overlies older granite-gneiss, it also overlies barren quartz veins. Other quartz veins cut Nonacho sediments. Many were seen near the contact of the younger granite at the western end of Thekulthili lake. These are not mineralized and consist of creamy white, drusy quartz. In the northwestern part of the area several quartz veins were observed to cut diabase dykes. They lie parallel with the dykes and include much larger veins than those of earlier age and are of a different type. In some cases they represent replaced and silicified country rock. In places the silicified rock has been brecciated and later cemented by a second generation of quartz. In other places, where previous silicification has been incomplete, the quartz deposits appear as a stock-work of ramifying quartz stringers intersecting the partly silicified country rock. Widths up to 200 feet and lengths up to 1,000 feet were observed. Besides the veins that are known to be younger than the diabase dykes there are many quartz deposits of the same brecciated and silicified character in all parts of the area and it is probable that all are of the same age. They are usually barren or at best contain a very little pyrite. Samples of quartz taken at several occurrences in the area yielded only very low values in gold.

The highly altered sediments and gneisses of Bedareh, Hotel, and Beddid lakes are cut by several quartz veins one of which, on the most western island of Bedareh lake, contains small lenses of pyrite with scattered galena crystals. The area underlain by volcanic rocks west of Lady Grey lake was hastily examined, but pyrite and galena were seen in several places. Galena-bearing veins are reported to occur north of the area on Taltson river and on Tsu lake and one was seen at the north end of a peninsula in Thekulthili lake about a mile north of the northern boundary of the area.

MAP 607A  
FORT SMITH  
DISTRICT OF MACKENZIE  
NORTHWEST TERRITORIES  
Scale, 25,000 or 1 Inch to 4 Miles  
Approximate magnetic declination, 27° to 35° East.