

Descriptive Notes

Lapie River is one of the larger tributaries of Pelly River which is an important tributary of Yukon River. Lapie River has its source in Lapie Lakes situated in Pelly Mountains on the divide between the drainage basins of Big Salmon and Pelly Rivers. It flows through the mountains in a general northeast direction along a narrow, U-shaped, steep-walled valley for some 28 miles until it reaches Tintina Trench and then turns north toward the Pelly. Upper Lapie Canyon dam site is located in the area where the river flows out of the mountains onto the relatively level floor of the Trench. It is about 9 and a half miles from the junction of Pelly and Lapie Rivers.

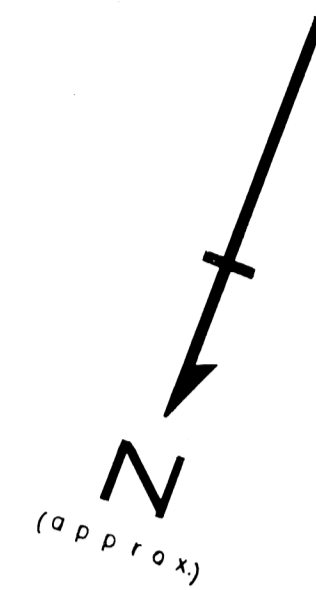
The dam site area has been glaciated probably by alpine ice which originated in Pelly Mountains and moved down grade along Lapie River valley into Tintina Trench. After glaciation melt waters followed the same route as the ice. Terraces were cut in bedrock along the sides of the valley and, except in protected areas, most of the till left by the ice was washed away. The entire area was covered with a deposit of glacio-fluvial sand and gravel of varying thickness. Upper Lapie Canyon consists of a narrow, rock-walled gorge which has been cut down into the floor of Lapie River valley in post-glacial time. The total drop in the river through the canyon is about 21 feet; about half of which occurs at the upstream end where the canyon is the most narrow.

The greater part of overburden covering ground surface at the proposed dam site is silty sand. This material is described on the accompanying geological map as glacio-lacustrine in origin. However, there is a strong possibility it may be aeolian. It is more coarse-grained than the silts occurring along Yukon River. The thickness of the deposit varies from a few inches to 4 feet. There is no visible stratification. Coarse-grained, glacio-fluvial, sandy gravel containing granitic and quartzitic boulders up to 24 inches in diameter underlies the silty sand. In the dam site area this material is exposed chiefly in excavations made during construction and maintenance of the Canol Road. Here the thickness of the deposits vary from 3 to 8 feet. However, exposures of similar material up to 40 feet in thickness occur along the Canol Road between the site and the community of Ross River some 5 miles distant. The gravel would be useful chiefly as fill. It is too dirty and bouldery to be used as aggregate. The gravel usually overlies bedrock; however, in two places in the dam site area till is visible beneath it. The till (sample No. 1) is a dense, greyish-brown, sandy, silty material which contains few rock fragments greater than 3 inches in diameter. Many of the pebbles in the 1 to 2-inch range consist of black chert. The till is exposed in a steep bank, 25 feet in height, along the left side of the river in the downstream part of the site area and in the bottom of a small excavation along Canol Road. It is a potential impervious material. Unlimited quantities are available within 5 miles of the dam site chiefly from deposits exposed along the Canol and Watson Lake - Ross River - Carmacks Roads.

A shallow deposit of fine-grained, sandy gravel occurs on a small terrace located on the left side of the river about 300 feet downstream from the bridge. This is believed to be alluvium deposited by Lapie River when it flowed at a higher elevation before cutting down into its present channel. The terrace is about 15 feet above the river. The small quantity available limits the use of the alluvium as a construction material. Recent alluvium consisting of silt, sand and gravel and containing many boulders up to 36 inches in diameter covers the flood plain of the river both upstream and downstream from the canyon. Similar material with a higher proportion of large boulders probably exists beneath the river in the canyon.

Bedrock exposed at Upper Lapie Canyon dam site consists of interbedded grey to black phyllite and grey quartzite. The phyllite strata are seldom more than 1 inch in thickness whereas the quartzite beds range up to 4 feet. Local folding has produced considerable distortion in the bedding and this along with zones of shattered rock associated with the numerous faults present suggests considerable remedial work will be necessary before the rock will provide satisfactory abutment and foundation material. The poor condition of bedrock may be due to the proximity of Tintina Fault, a major structure which is believed to follow along the southwest side of Tintina Trench close to Pelly Mountains. To prevent leakage of reservoir water grouting will be necessary especially along the faults. In general the bedding strikes between west and north 45 degrees west and dips steeply to the north. Many faults are visible in the walls of the canyon but only the larger are indicated on the accompanying map. Few of these are parallel to the northwest trend of Tintina Fault. Numerous intersecting joints in bedrock have decreased the stability of the canyon walls and increased the permeability of the rock mass. There are 2 prominent joint sets which intersect at angles close to 90 degrees. One set is parallel to the upstream part of the canyon above the sharp bend and dips steeply into the right wall. The other set closely parallels the downstream section of the canyon where it has a strike and dip similar to the bedding.

The most competent rock is exposed along a 250-foot section in the northwest-trending, upstream section of the canyon. Numerous bedrock exposures indicate overburden is thin in the left abutment area. There is no indication, however, as to the thickness of overburden on the right abutment. It is estimated there is about 25 feet of alluvium beneath the river in the canyon. There is little information regarding groundwater in the area. Springs or seeps do not occur in the walls of the canyon although there is some evidence of previous percolation of groundwater along the fault zones. On August 16, 1966 the frost line occurred about 21 inches below ground surface in the silty sand covering the gently sloping terrace south of the canyon.



GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF ENERGY, MINES AND RESOURCES

LEGEND

- QUATERNARY**
- 6 RECENT ALLUVIUM : gravel, sand, silt, boulders to 36 inches
 - 5 ALLUVIUM : sand, gravel, minor silt
 - 4 GLACIO-LACUSTRINE : sand, fine-grained, silty, aeolian in part
 - 3 GLACIO-FLUVIAL : gravel, sandy, silty, boulders to 24
 - 2 TILL
- PALAEZOIC**
- 1 PHYLLITE, QUARTZITE

- Bedding
- Jointing
- Fault
- Geological boundary (approximate)
- Edge of outcrop
- Limit of excavation made during construction and maintenance of road
- Area where frozen soil was encountered within 18 inches of ground surface
- Magnetic declination : 32 20' E. (approximate)

YUKON RIVER DRAINAGE BASIN
SITE NO. 33
**UPPER LAPIE CANYON
DAM SITE**

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