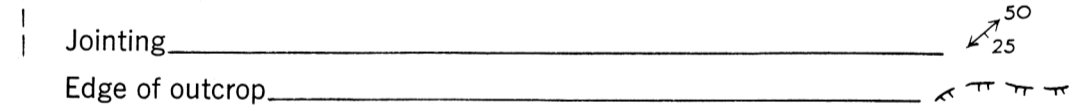
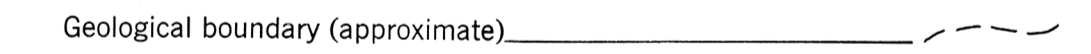
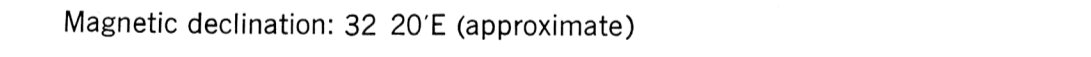

 GEOLOGICAL SURVEY OF CANADA
 DEPARTMENT OF ENERGY, MINES AND RESOURCES

LEGEND

CENOZOIC	3	QUATERNARY TALUS: in places a mixture of rock fragments and gravel
	2	GLACIO-FLUVIAL: sand, gravel
PRECAMBRIAN (?)	1	LIMESTONE: fine-to medium-grained, light grey, buff-weathering
	Jointing  Edge of outcrop  Geological boundary (approximate)  Magnetic declination: 32 20' E (approximate)	

YUKON RIVER DRAINAGE BASIN
 SITE NO. 38
**LOWER LAPIE CANYON
 DAM SITE**
 TO ACCOMPANY TOPICAL REPORT NO. 115
 GEOLOGY BY E. B. OWEN, 1964

General Description

Lapie River is one of the larger tributaries of Pelly River which is an important tributary of Yukon River. At its junction with Lapie River the Pelly is flowing along a great valley which extends in a northwest direction across much of the southern part of Yukon Territory. This valley is known as Tintina Trench. Lower Lapie Canyon dam site is situated at the upstream end of a mile-long gorge cut into the floor of Tintina Trench by Lapie River as it flowed northward across the Trench from its source in Pelly Mountains to Pelly River. The upper end of the canyon was selected as the most suitable for a dam site as the limestone exposed in the walls of the canyon in this area was believed to be more competent than the soft, weathered schists which occurred further downstream.

During the last glaciation Tintina Trench was filled with ice which moved downgrade in a northwest direction. Glacial erratics were not observed during this investigation but in the vicinity of the site several ridges whose long axis parallel the Trench occur on its floor. The material forming the ridges consists of dense till although, in some, a bedrock core may exist. The soil samples described in the accompanying report were taken along the Ross River - Carmacks Road from cuts into the sides of various ridges. In general the areas between the ridges are covered with glacio-fluvial material ranging from fine-grained sand to coarse-grained gravel.

Overburden at Lower Lapie Canyon dam site consists almost entirely of coarse-grained, sandy gravel containing numerous rounded to subrounded quartzite and granitic boulders up to 12 inches in diameter. The limestone and schists exposed in the vicinity of the canyon are relatively soft rocks and consequently seldom occur in the gravel. The gravel has been used as base-course material on the Ross River - Carmacks Road with satisfactory results. It could probably be processed to produce a satisfactory aggregate but, because of the predominance of hard, durable rocks and the lack of fine material, this would be an expensive process. The quantity of gravel available is unlimited. In the dam site area it probably directly overlies bedrock although in places till may exist between the gravel and bedrock. Talus which is the result of the mechanical disintegration of adjacent bedrock occurs on the less steep walls of the canyon in the downstream part of the dam site area. The greater part of the talus consists of large, angular blocks of limestone, some several feet in diameter. Mixed with these are smaller, more weathered fragments which grade down into sand-size particles. The size and shape of the rock fragments in the talus indicates suitable riprap could be obtained from fresh bedrock. The weathered rock would tend to break into small, less durable fragments when blasted.

Bedrock exposed at the dam site consists of fine- to medium-grained, buff-coloured, highly weathered limestone. Much of the weathering occurs along irregular, hair-thin fractures in the rock where the limestone has decayed to a fine-grained, silty material. In places the weathering has penetrated as much as 30 feet into the limestone and consequently considerable rock will have to be removed before fresh rock against which concrete can be placed will be exposed. Although the limestone is shattered well below the limit of weathering it is believed the fresh rock is competent and should provide satisfactory abutment and foundation material for the dam structures. If it is found necessary to grout the limestone this would have to be done at low pressures, especially near surface.

Jointing in the limestone is irregular with prominent local sets. Although most of the rock fragments in the talus have broken off along the jointing it has not influenced the directions in which the river is flowing through the dam site area. There are no visible faults in the limestone. The surface cracks indicated on the test hole plan of the Department of Public Works which is included in the accompanying report occur along the jointing.

The limestone is relatively impermeable. It was reported solution cavities up to 4 inches in diameter were encountered in the test holes but there was no evidence of these in the bedrock cores obtained by the Department of Public Works during their drilling investigation to determine the suitability of the limestone for bridge abutments. Seepages of groundwater occur in the right wall of the canyon about 15 feet above the river beneath the temporary bridge. Frozen soil probably exists beneath at least part of the dam site area. It was encountered in places during construction of the new road and also in a well drilled in the community of Ross River.

