GEOLOGICAL SURVEY OF CANADA
DEPARTMENT OF MINES AND TECHNICAL SURVEYS

PRELIMINARY SERIES

SHEET 104J

LEGEND

QUATERNARY
PLEISTOCENE AND RECENT

- 11 — Fluviatile gravel, sand, and silt; glacial outwash; till and alpine moraine

TERTIARY AND QUATERNARY
LATE TERTIARY AND PLEISTOCENE

- 10 — Basalt, olivine basalt; minor trachyte and rhyolite; in part younger than 11

TERTIARY
PALEOCENE AND (?) LATER

- 9 — Lacustrine sandstone, siltstone, conglomerate, and tuff; contains coalified wood and thin coal seams

JURASSIC
LOWER JURASSIC

- 8 — Granite-boulder conglomerate, chert-pebble conglomerate, greywacke, quartzose sandstone, siltstone and shale; 8a, metamorphosed equivalents of 8 and including abundant sills and dykes of quartz-feldspar porphyry
- 7 — Well bedded greywacke, graded siltstone and silty sandstone, slate; minor volcanic sandstone and pebbly mudstone; 7a, metamorphosed equivalents of 7 and including abundant sills and dykes of quartz-feldspar porphyry

TRIASSIC AND LATER

- 6 — Undifferentiated granitic rocks, mainly granodiorite; 6a, granite and granodiorite; 6b, quartz monzonite; 6c, diorite and monzonite; 6d, syenite; 6e, diorite and gabbro

TRIASSIC
UPPER TRIASSIC

- 5 — Limestone; minor sandstone, argillite, and chert
- 4 — Andesite, basalt, tuff, breccia, volcanic sandstone and conglomerate; minor greywacke, argillite, and shale; many small stocks, dykes, and sills of porphyritic andesite and basalt; 4a, andesite and basalt porphyry

TRIASSIC AND EARLIER
PRE UPPER TRIASSIC

- 3 — Undivided, fine-grained clastic sediments and intercalated volcanic rocks, largely altered to greenstone and phyllite; chert, jasper, greywacke, and limestone; 3a, chert, slate, argillite, greywacke, greenstone, and limestone; mainly pre-Permian but probably includes younger rocks; 3b, mainly greenstone; age uncertain; 3c, greenstone, jasper, slate, chert, greywacke, fine-grained clastic rocks, conglomerate; mainly post-Permian, in part older than 2

PERMIAN

- 2 — Chiefly limestone and dolomitic limestone; minor chert, argillite, and sandy limestone; may locally include limestone older than 2

PERMIAN (?)

- 1 — Peridotite, serpentinite, and small irregular bodies of meta-diorite and meta-gabbro; age uncertain, may be pre-Permian or Triassic

METAMORPHIC ROCKS

- A — Diorite-gneiss, amphibolite, migmatite
- B — Biotite-muscovite-quartz gneiss and schist; minor crystalline limestone, greenstone, and quartzite; probably Devono-Mississippian and (?) Pennsylvanian

Geological boundary (defined, approximate and assumed)
Limit of geological mapping
Bedding (inclined, vertical)
Bedding (direction of dip known, upper side of bed unknown)
Schistosity, gneissosity, (inclined, vertical)
Anticline
Syncline
Syncline (overturned)
Fault (defined, approximate, assumed)
Fossil locality
Glacial striae

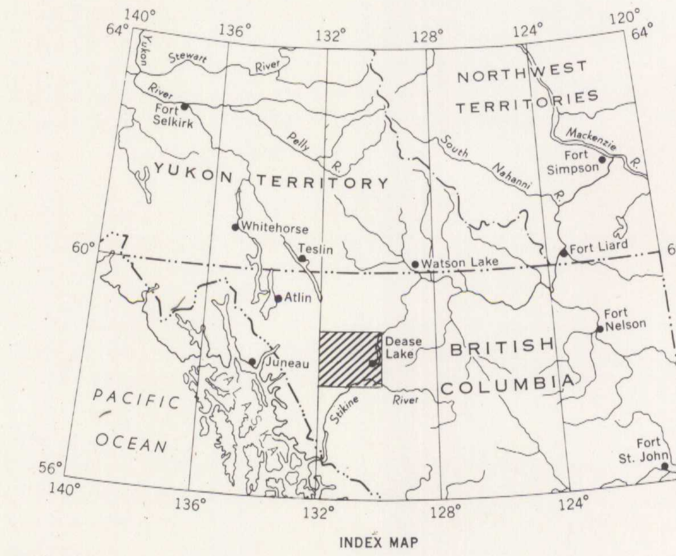
Geology by H. Gabrielse and J.G. Souther, 1956 and 1961, E. F. Roots, 1958, and Officers of Geological Survey of Canada: 'Operation Stikine', 1956

Cartography by the Geological Survey of Canada, 1962

Road, dry weather
Trail
Horizontal control point
Intermittent stream
Marsh
Glacier
Contours (interval 500 feet)
Height in feet above mean sea-level . . . 5211

Base-map by the Army Survey Establishment, R. C. E., Department of National Defence, 1950-53

Mean magnetic declination, 30° 03' East, decreasing 3.6' annually. Readings vary from 29° 29'E in the SW corner to 30° 45'E in the NE corner of the map-area.



INDEX MAP

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MAP 21-1962
GEOLOGY
DEASE LAKE
BRITISH COLUMBIA

Scale: One Inch to Four Miles = $\frac{1}{253,440}$

Miles
4 2 0 4 8 12

DESCRIPTIVE NOTES

The Cassiar-Stewart Road and the Telegraph Creek - Dease Lake Road provide access to the eastern and southern parts of the map-area. Travel with horses is easy on parts of the Kawdy Plateau and in much of the country east of Tuya River. Areas of muskeg are common in the broad valley north of Level Mountain Range and on the upland surfaces west of Tuya River.

An airstrip at the Department of Transport weather station near the south end of Dease Lake is available for small aircraft.

The map-area lies mainly within the Stikine Plateau, a region of subdued topography flanked to the northeast by the moderately rugged Cassiar Mountains and to the southwest by the extremely rugged Coast Mountains. Many of the major streams have cut deep gorges in the lower-lying parts of the plateau.

Banded metamorphic rocks (A) in the southwesternmost part of the map-area grade through a zone of mixed rocks into diorite (6c). Some of the banding shows evidence of plastic flowage but most is regular and displays textural gradations suggestive of original bedding. Metamorphosed stratified rocks (B) near Dease River are on trend with similar rocks of probable Devono-Mississippian age to the northwest in Jennings, Teslin[1], and Wolf Lake[2] map-areas.

Peridotite bodies (1) extending northwesterly from Hatin Lake are a continuation of the Nahlin ultramafic body in Tulsequah[3] and Atlin[4] map-areas. Throughout most of its length this body is bounded by steep, northeasterly dipping reverse faults, interrupted north of Hatin Lake by a system of east-west faults. Peridotite in the central part of the larger fault blocks is a coarse-grained layered rock with widely spaced zones enriched in pyroxene and olivine. The smaller wedges and fragments in the fault zones have been extensively sheared, serpentinized, carbonatized, and in many places cut by a boxwork of chalcedony stringers. Relatively fresh peridotite occurs locally in the larger ultramafic bodies near Tachilta Lakes, but elsewhere the rocks are highly serpentinized and locally carbonatized.

Permian limestone (2) is at least 2,000 feet thick between Nahlin and Koshin Rivers but can be little more than 500 feet thick near Mount Rath in French Range. This difference in thickness appears to be the result, primarily, of depositional thinning, and secondarily, of erosion prior to deposition of the overlying rocks (3c). The relation of the Permian limestone (2) to underlying rocks (3a) is obscured by intense deformation and a paucity of fossils. On Rath Creek the two units (2,3a) are structurally conformable.

The Permian limestones (2) are within broad belts of intensely deformed pre-Upper Triassic rocks (3). At least part of the post-Permian succession (3c) is believed to be equivalent to lithologically similar rocks of Middle Triassic age in Chutine map-area[5]. In the northwestern corner near Tseta Creek, the Middle Triassic (?) sedimentary rocks are overlain by greenstone, some of which exhibits pillow structure. In French Range the post-Permian rocks (3c) unconformably overlie Permian limestone (2) and include greenstone, jasper, and basal conglomerate. The pre-Permian rocks (3a), however, include several limestone members, only minor greenstone, and no jasper or conglomerate.

Karnian (early Upper Triassic) fossils have been collected from relatively thin lenticular members of tuffaceous shale, argillite, and limy siltstone in the dominantly volcanic Upper Triassic sequence (4). The layered rocks are cut by tabular and irregular bodies of black to dark green porphyritic andesite and basalt containing phenocrysts as much as 1/2 inch across. Contacts between the dominantly volcanic sequence (4) and the overlying limestone (5) are poorly exposed.

Hornblende diorite and monzonite (6c) are the principal plutonic rocks in the western part of the map-area. Unlike the main body of Coast Intrusions farther west, granodiorite and quartz monzonite (6a,6b) are of secondary importance. The two crosscutting stocks (6a) near Granite and Tachilta Lakes are of relatively uniform composition. Granitic rocks north of Dease Lake are extremely heterogeneous in composition, ranging from gabbros (6e) to quartz monzonites (6b). These rocks are in marked contrast to the almost homogeneous quartz-monzonite typical of the Cassiar Intrusions to the northeast. A small body of syenite (6d) west of Tuya River, near the centre of the map-area, has been highly altered to white-weathering clay minerals.

Lower Jurassic sedimentary rocks (7,8) occur as two distinct facies. The southern belt of rocks (8) is characterized by features indicating near-shore, relatively shallow-water deposition, whereas the northern belt of rocks (7), as much as 10,000 feet thick along Dudidontu River, exhibits features indicating deep-water deposition. In Tulsequah map-area west of Heart Peaks, and in the Cry Lake area to the east, the northern facies of Lower Jurassic rocks (7) has been thrust southwesterly over the southern facies (8), but the contacts are mainly obscured by overburden in Dease Lake map-area. The Lower Jurassic rocks (7) are bounded to the north and northeast by pre-Upper Triassic strata (3).

Poorly consolidated, flat-lying or gently dipping sedimentary rocks (9) exposed in the canyons of Nahlin and Koshin Rivers are thought to be fluvial debris deposited in a Tertiary lake formed above a lava dam near the mouth of Koshin River. Fossil plants indicate that Cenozoic rocks exposed along Tuya and Stikine Rivers are, at least in part, of Paleocene age and probably correlative to the Sustut Group in Spatsizi map-area[6] to the southeast.

The nearly-flat-lying basaltic rocks of Level Mountain, Kawdy Plateau and Heart Peaks have been erupted at various times, beginning in the late Tertiary and continuing into Recent time. The older flows along the flanks of Level Mountain rest on a surface of moderate relief and have been dissected by stream erosion before extrusion of younger lavas. Evidence of intraglacial eruption is found in pillow lâvas, presumably formed in marginal glacial lakes, high on the slopes of Level Mountain. Also, many flows rest on glacial debris and their surface has been scoured by later ice-movement. The most recent eruptions, which postdate the last glaciation, are represented by rough irregular flow surfaces with collapsed lava tubes, pahoehoe, and undisturbed ash and bombs.

In general, the stratified rocks have northwesterly and westerly structural trends. Along Dudidontu River, Lower Jurassic rocks (7) are repeated by upright folds interrupted by many steep, northerly dipping faults. Permian (2) and pre-Upper Triassic rocks (3) are intensely folded and crumpled. In French Range, beds are commonly overturned to the southwest and isoclinal folds are abundant. Cleavage has been strongly developed in the thin-bedded rocks exposed along Dease Creek. The cleavage planes form loci of small southwesterly directed thrust faults accompanied by a sympathetic folding of the beds. The inferred northeasterly dipping thrust fault that separates the two facies of Lower Jurassic rocks (7,8) and the northeasterly dipping thrust faults bounding the Lower Jurassic rocks (7) to the north and northeast are of regional significance, having been traced for many miles east and west of the map-area.

Drilling and trenching have been carried out along one of the northwesterly trending faults about 5 miles west of Tedideech Lake where small amounts of millerite occur with chalcedony in sheared serpentine and greenstone. Similar nickeliferous rocks were observed in a parallel fault zone 2 1/2 miles to the southwest. Exploratory work has also been done on a property on Copper Creek about 4 miles southeast of Sheslay, where chalcopyrite, pyrite, and pyrrhotite occur in fractures and fissures in Triassic volcanic rocks (4). Minor amounts of chrysotile asbestos have been observed in many of the ultramafic bodies (1), particularly those near Tachilta Lakes. Placer gold has been recovered in substantial quantities from Dease and Thibert Creeks and their tributaries.

[1] Mulligan, R.: Teslin Map-area, Yukon Territory; Geol. Surv., Canada, Paper 54-20 (1955).
[2] Poole, W. H., Roddick, J. A., and Green, L. H.: Wolf Lake Map-area, Yukon Territory; Geol. Surv., Canada, Map 10-1960.
[3] Souther, J. G.: Tulsequah Map-area, British Columbia; Geol. Surv., Canada, Map 6-1960.
[4] Aitken, J. D.: Atlin Map-area, British Columbia; Geol. Surv., Canada, Mem. 307 (1959).
[5] Souther, J. G.: Chutine Map-area, British Columbia; Geol. Surv., Canada, Map 7-1959.
[6] Geological Survey of Canada: Stikine River Area, Cassiar District, British Columbia; Geol. Surv., Canada, Map 9-1957.

MAP 21-1962
DEASE LAKE
BRITISH COLUMBIA
SHEET 104 J