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MACMILLAN FOLD BELT
EVIDENCE FOR DEVONIAN FAULTING by J.G.Abbott
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STRUCTURE AND STRATIGRAPHY OF THE MACMILLAN FOLD BELT: EVIDENCE FOR DEVONIAN FAULTING

BY

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ABSTRACT

This study describes the structural and stratigraphic setting of Devonian bedded barite and sedimentary exhalative lead-zinc-silver-barite deposits near MacMillan Pass in eastern Yukon. It shows that the deposits occur within MacMillan Fold Belt, an anomalous west-trending feature made up of three parallel elongate domains called the North, Central and South Blocks. Each is characterized by distinctive styles of deformation and Devonian strata.

The North Block is characterized by a thick Early and Middle Devonian chert and shale sequence included in the Lower Earn Group and by an intricate array of southerly directed thrust faults. The Central Block includes unusually thick Early and Middle Devonian silty limestone intercalated with volcanic and volcaniclastic rocks within the upper part of the Road River Group. The Tom and Jason sedimentary exhalative zinc-lead-silver-barite deposits are associated with a thick sequence of coarse clastic rocks thought to belong to a submarine fan complex within the Lower Earn Group. Tight upright folds, high angle reverse faults and irregularly oriented faults are characteristic.

In the South Block, the Lower Earn Group comprises a thin Devonian shale sequence. Open upright folds and few faults are the structural style. The differences in Devonian strata and contrasting style of deformation between blocks may reflect older (Devonian?) fault control to depositional patterns, but structures of that age have not been identified.

INTRODUCTION

This study examines the stratigraphic and structural setting of bedded barite, sedimentary exhalative lead-zinc-silver-barite and tungsten-bearing skarns near MacMillan Pass, in southeast Niddery Lake (105-O 1, 2, 7, 8) and southwest Sekwi Mountain (105-P-4) map-areas. Bedrock exposure is exceptionally good and further systematic mapping is planned for 1982.

Previous work includes reconnaissance mapping by Blusson (1971, 1974), and detailed studies of bedded barite by Dawson (1977, 1982 in prep), of the Tom and Jason Deposits by Carne (1979) and Winn et al (1981) and of the Mactung tungsten-bearing skarns by Harris (1976).

The writer thanks S. Gordey and geologists working for Hudson Bay Exploration and Development Co. Ltd., Pan Ocean Oil Ltd., Amax Exploration, Cominco and AGIP Canada Ltd., for cooperation, support and stimulating discussions. Discussions with D. Tempelman-Kluit and his constructive criticism of an early draft of this paper are greatly appreciated.

GENERAL GEOLOGY

The stratigraphy of the MacMillan Pass area is similar to that defined by Cecile (1980) in northeast Niddery Lake map-area (105-O) and by Gordey (1981a,b) in Nahanni map-area (105-I). These areas are at the boundary between Mackenzie Platform and Selwyn Basin and are underlain by sedimentary rocks ranging from late Proterozoic through Triassic.

Figure 1 shows the distribution of five main subdivisions within the sedimentary rocks. Lower Cambrian through Middle Devonian carbonate rocks define Mackenzie Platform. Early Ordovician and older clastic rocks include the "Grit Unit" and shaly equivalents of platform carbonate rocks of the Lower Cambrian Sekwi Formation and Cambro-Ordovician Rabbitkettle Formations. Ordovician, Silurian and Devonian shale, chert and less limestone of the Road River 'Group' makes up Selwyn Basin. Devonian through Triassic clastic rocks blanket Selwyn Basin and Mackenzie Platform and include the Devonian-Mississippian Earn Group and three younger, regionally mappable units. (Gordey et al 1982, in press). The Earn Group marks a profound change to sedimentation probably related to rifting or extensional faulting and includes two units of chert, shale, sandstone and chert pebble conglomerate. Bedded barite and lead -zinc-silver-barite deposits occur within the Lower Earn Group. Carboniferous quartz arenite, shale and limestone unconformably overlie the Earn Group and indicate a return to normal marine sedimentation. The two youngest units are Permian chert and shale and Triassic sandstone and shale. The sedimentary rocks are deformed and intruded by Cretaceous stocks and batholiths. These are not shown in Figure 1 for clarity.

Folds and faults near MacMillan Pass define a 30 km wide, 60 km long belt that trends west northwest across the general structural grain which is more northerly. The belt is here named the MacMillan Fold Belt.

STRATIGRAPHY

The geology of the MacMillan Fold Belt is shown in Figures 2 and 3. Three domains, called the North, Central and South Blocks, make up the Fold Belt. Each is defined by a different style of deformation and Devonian stratigraphy. Boundaries to the three blocks are shown in Figures 3 and 5. Idealized stratigraphic columns for each are shown in Figure 4.

In 1981, emphasis was placed upon understanding the complex Devonian stratigraphy. Less attention was paid to other strata and the assigned ages of many map units are inexact and their detailed stratigraphy was not determined.

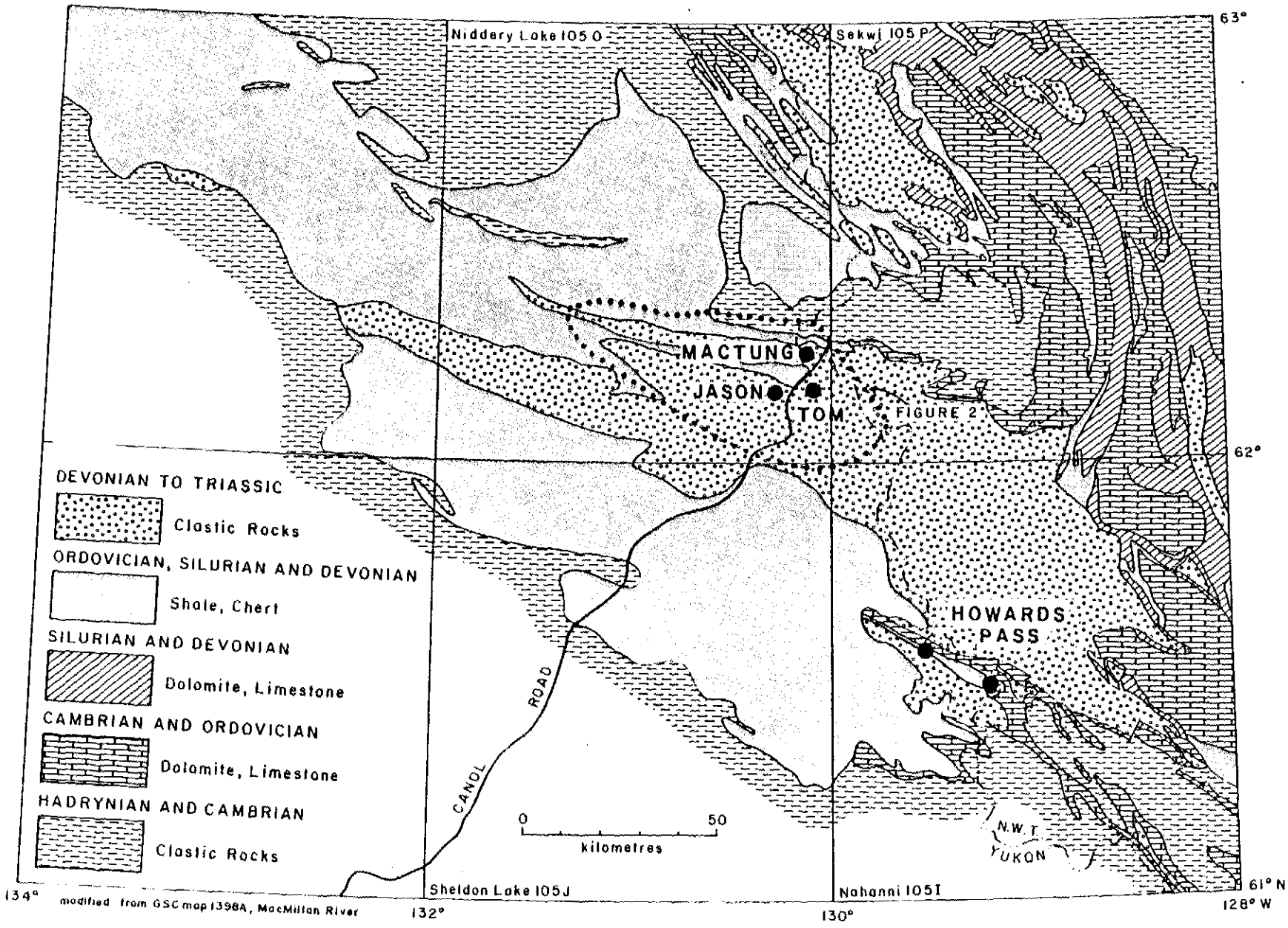

Figure 1: Location and geological setting of MacMillan Fold Belt.

LEGEND
(To accompany Figures 2, 3 and 4)

CRETACEOUS

Kg - Resistant, blocky, grey weathering porphyritic to equigranular hornblende granodiorite, biotite quartz monzonite and biotite granite.

TRIASSIC

Rs - Recessive, dull brown weathering thin-bedded to thinly laminated calcareous sandstone, siltstone and shale.

PERMIAN AND (?) PENNSYLVANIAN

Pst - Resistant, dark orange brown weathering interbedded greenish grey chert, cherty shale and recessive green shale.

CARBONIFEROUS

Cl - Grey weathering thick-bedded to massive bioclastic limestone; minor quartz arenite and shale.

Cq - Dark grey weathering massive quartz arenite and sandstone;

Csp - Recessive, brown weathering dark grey silty shale and shale, minor thin beds of sandstone.

MISSISSIPPIAN

UPPER EARN GROUP

Msp - Resistant, brown weathering, thick-bedded, ripple crosslaminated sandstone, siltstone and shale overlain by recessive blue weathering siliceous shale; in turn overlain by resistant dark brown weathering thin-bedded, dark grey shale and silty shale.

LOWER EARN GROUP (symbols)

muDpt - Talus forming, silver blue weathering, platy siliceous shale, minor chert and rare thin 2-5 cm thick beds of coarse-grained limestone and platy grey weathering barite in beds less than 1 m thick.

(?) MIDDLE AND LATE DEVONIAN

muDcg - Resistant, grey weathering resistant chert pebble conglomerate.

muDps - Brown weathering thinly laminated grey shale and siltstone with less chert, quartz sandstone and grit.

EARLY AND MIDDLE DEVONIAN

emDpt - Black to dark blue weathering thin-bedded chert, cherty argillite and siliceous shale. Light grey clastic limestone in beds 1 m thick or less near base and intermittent barite up to 30 m thick in 1 or more horizons.

SILURIAN, EARLY AND MIDDLE DEVONIAN

SDv - Orange weathering, mafic alkaline volcaniclastic rocks, and minor related sedimentary rocks. Local blocky, resistant dark grey weathering coarse-grained mafic alkaline lava flows.

ORDOVICIAN, SILURIAN AND EARLY DEVONIAN

ROAD RIVER 'GROUP'

OSDpt - Upper Division; Buff to tan weathering platy, silty limestone.
Middle Division; Orange to green weathering bioturbated, wispy laminated green shale and mudstone.
Lower Division; Brown weathering, medium-bedded chert overlain by silver to dark blue weathering, thin-bedded black chert and siliceous shale.

(?) HADRYNIAN, CAMBRIAN AND ORDOVICIAN

€Op - Upper Division; (facies equivalent to Rabbitkettle Fm). Brown weathering, grey and green shale, limestone conglomerate and thin interbeds of grey clastic limestone. Orange and grey weathering, thick-bedded limestone less than 10 m thick occurs locally at the top.
Lower Division; Dark brown and grey weathering grey shale and silty shale; ("Grit Unit") Maroon, green and brown weathering shale, minor quartz grit and sandstone.

Geological contact; defined, approximate

Reverse fault

High angle fault with normal and/or unknown directions of movement

Syncline; defined, approximate

Anticline; defined, approximate

Figure 2
GEOLOGY
MacMillan Fold Belt

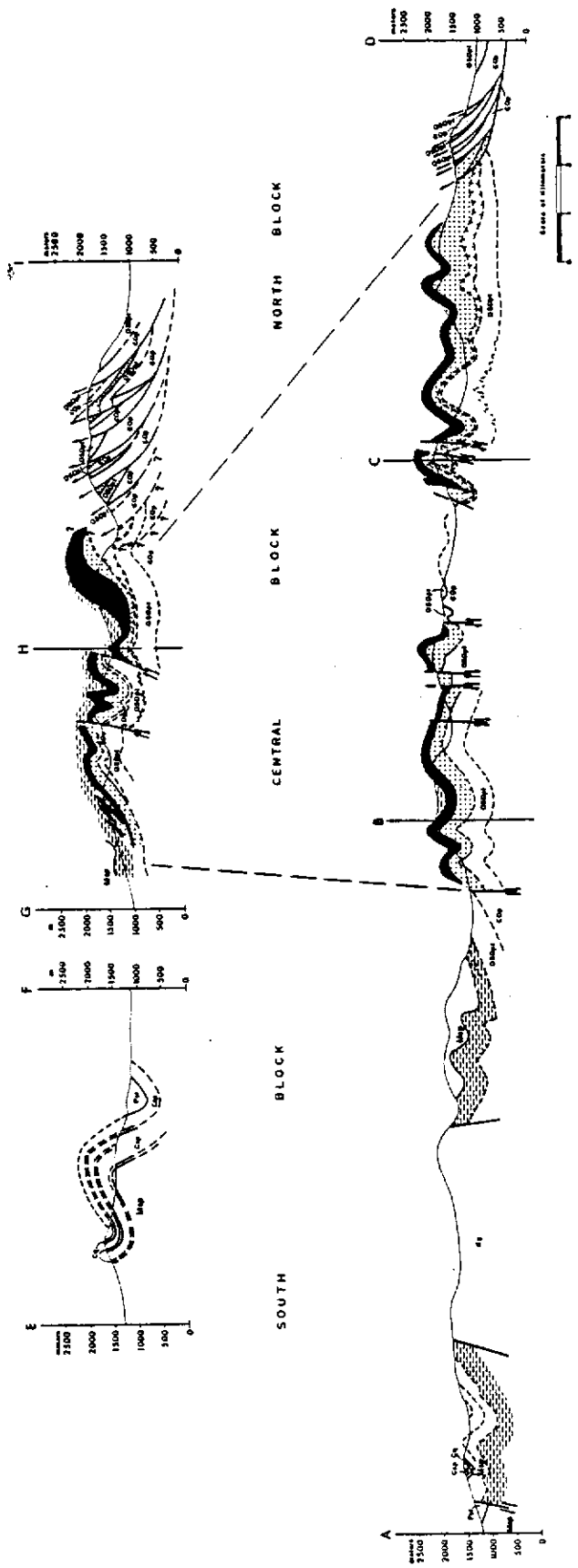

Figure 3: Structure Sections across the MacMillan Fold Belt.

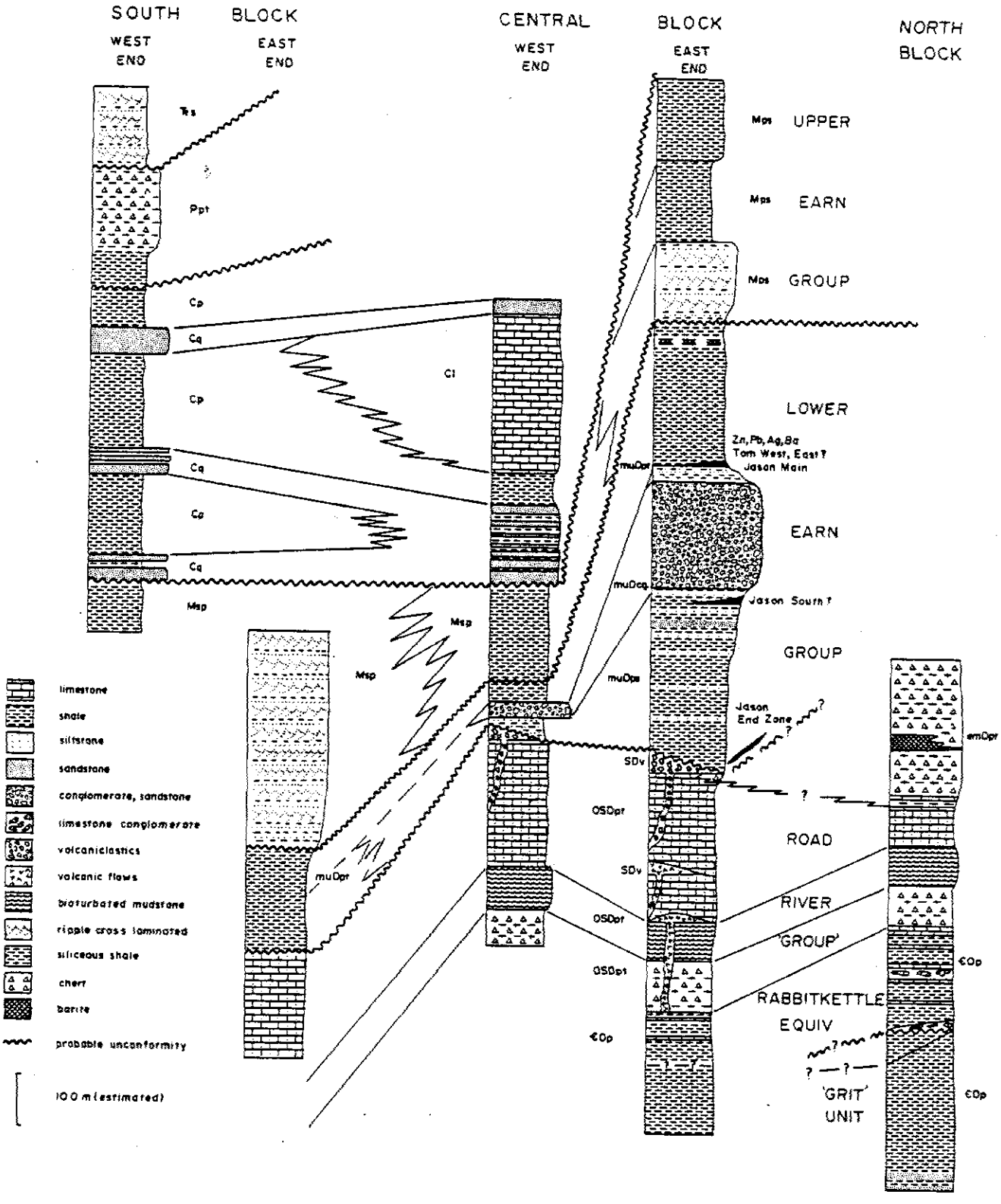

Figure 4: Idealized stratigraphic columns from different parts of MacMillan Fold Belt.

Microfossil collections made by the writer were identified by M. Orchard of the Geological Survey of Canada in Vancouver. All but two Cambro-Ordovician collections are described by Gordey et al (in press). Graptolite collections were identified by B.S. Norford of the Geological Survey of Canada in Calgary.

€Op

Map unit €Op, the oldest within the MacMillan Fold Belt, includes at least two divisions. The oldest is exposed in thrust slices in the North Block and belongs to the Proterozoic and/or Early Cambrian "Grit Unit". Maroon and green shale interbedded with minor brown weathering shale comprise most of the unit. Grey weathering, brown quartz grit and sandstone interbedded with recessive brown shale and siltstone were observed in one thrust slice. These rocks are not observed in contact with the slates but are presumed to underlie them. At least 200 m of strata are exposed. Lower contacts are tectonic and relations with overlying Cambrian and Ordovician strata are probably unconformable.

At the east end of the North Block, the oldest exposed rocks are resistant, dark grey weathering homogenous grey and grey-green slate more than 200 m thick. The grey slates are likely younger than the varicoloured slates of the "Grit Unit", but may also be facies equivalents.

Buff to brown weathering phyllite about 200 m thick overlies the "Grit Unit" and the grey weathering slates. The phyllite is thinly laminated to homogenous and grey or pale green on fresh surfaces. Wispy lamination and flaser bedding are common in the upper part of the unit. Grey weathering limestone beds to 10 cm thick occur throughout. They make up nearly a quarter of the section in the east near Mactung and decrease to a single intermittent orange and grey weathering horizon up to 10 m thick at the top of the unit in the west. Limestone conglomerate 1 to 10 m thick occurs intermittently and mostly at the base. Most clasts are a few cm across, but some reach 20 cm. Clast shape varies from angular to rounded. Thickness and clast size increase from west to east and the conglomerates are interpreted to be debris flows derived from a carbonate bank margin east of the map area.

In the Central Block, unit €Op comprises dull brown weathering grey phyllite about 200 m thick. In the upper part, the phyllite is interbedded with conspicuous orange weathering laminae and thin beds of brown and grey weathering limestone. Lower parts of the unit are gray slate that weathers an even brown colour.

Limestone at the top of the brown phyllite at the western end of the North Block has yielded Early to Middle Ordovician conodonts. In the Central Block, Early Ordovician conodonts were obtained from thin limestone interbeds in the upper part of the unit. Graptolites from one collection in shale near the top of the unit are Early to early Middle Ordovician. These rocks are therefore time equivalent to the Rabbitkettle Formation (Blusson, 1971) found farther to the east within Mackenzie Platform. In the Central Block, the lower noncalcareous parts could be older. A regional unconformity that separates the Rabbitkettle Formation from older strata probably accounts for the absence of the thick sequence of grey slate in the west end of the North Block where the Cambro-Ordovician rocks overlie the "Grit Unit".

Road River Group (OSDpt)

The Road River 'Group' (OSDpt) includes three divisions. Medium-bedded, brown weathering chert with thin slate interbeds makes up the lower half of the lower division, and silver blue weathering thin bedded chert and black graphitic slate makes up the upper half. Near Mactung the lower division is about 100 m thick, but farther west it thins to 50 m. In the Central Block, the

thickness reaches 100 m. Graptolites collected from the lower division are as old as late Middle to Late Ordovician and as young as Early Silurian.

The middle division is commonly referred to as the wispy mudstone or orange weathering mudstone. Brown to orange weathering bioturbated, flaser bedded pyritic green slate and mudstone are typical. The orange mudstone reaches 50 m in thickness, but interfingers with black shale and is missing in a few places. The wispy mudstone is lithologically like wispy laminated rocks in the upper part of unit COpt, and the two units are easily mistaken in the field.

The upper division is referred to as the silty limestone unit, and consists of tan weathering, thin-bedded dark grey to black silty limestone. In the North Block, the silty limestone ranges from 0 to 70 m in thickness. Elsewhere, the thickness reaches 300 m. The silty limestone unit is in sharp contact with the underlying orange mudstone and appears to be gradational over a few metres with overlying black chert and shale of the Lower Earn Group. Conodonts collected from the top of the unit are as young as Early Devonian (Late Pragian to Early Emsian) in the North Block and Middle Devonian (Early to Middle Eifelian) in the Central Block. Graptolites collected near the top are Early Devonian (Pragian) in both blocks. The abrupt thickness changes between the North and South Blocks might be depositional and related to a 'growth' fault situated at the boundary between the two blocks but erosional truncation along an unconformity and/or a facies change to chert and shale of the Lower Earn Group is also possible.

Silurian (?) and Devonian Volcanics (SDv)

Within the Central Block, the silty limestone is intercalated with orange weathering volcanics, volcaniclastic rocks and related clastic sedimentary rocks (SDv). The volcanic rocks occur in at least two stratigraphic horizons. The oldest are lava flows several kilometres northwest of the Jason Property at or near the base of the silty limestone. They are resistant, massive dark grey weathering and up to 20 m thick and 1 km long. Fresh surfaces are grey-green medium- to coarse-grained and equigranular. Thin sections show equal proportions of dark green pyroxene and feldspar that are partially altered to chlorite and carbonate. Underlying rocks are baked, silicified and veined and replaced by orange weathering carbonate.

The younger volcanic rocks are mainly fragmental and are made up of angular dark green clasts 1 or 2 cm across in an orange weathering carbonate matrix. On weathered surfaces, fragments stand out to produce a distinctive nubbly texture. Orange weathering, thin bedded sandstone and siltstone derived from the volcaniclastic rocks are locally intercalated with them. The volcaniclastic rocks are intermittent, vary abruptly from 0 to 70 m in thickness and are in sharp contact with underlying and overlying strata. In most places they overlie the silty limestone, but locally are separated from it by up to 5 m of black cherty argillite that is also intercalated with the volcanic rocks.

Feeders to the volcanic rocks are common throughout the Road River Group in the Central Block. Most are irregularly shaped and many are plug-like, but few exceed 20 m in width. Feeder rocks include orange weathering massive, homogenous pale green varieties and breccias. The breccias contain sedimentary and intrusive fragments in a pale green carbonate-rich matrix. Alteration zones were not seen and volcanism was probably short lived and explosive.

The volcanic rocks are like others reported within the Road River 'Group' in the region by Cecile (1980, pers. comm. 1982) who has named them the Marmot Formation. Most are Ordovician and Silurian and a few are Early Devonian. Conodonts collected from calcareous black shale in and beneath the volcaniclastic rocks in the MacMillan Fold Belt are early Middle Devonian making them the youngest known within the Road River Group.

Lower Earn Group (emDpt, muDpt, muDps, muDeg)

The Lower Earn Group includes four units. Two (emDpt, muDpt) are a siliceous or cherty facies and two (muDps, muDcg) are of clastic rocks. The clastic facies is thought to represent a turbidite fan complex (Carne 1979) derived from the west (Winn et al 1981) and is confined to the Central Block. The siliceous facies includes rocks that are older, time equivalent to, and younger than the clastic facies and is exposed in all blocks.

Unit emDpt, the oldest within the Lower Earn Group is exposed within the North and Central Blocks. In the North Block, 200 m of dark blue-grey weathering thin-bedded chert, argillite and shale are exposed. These rocks resemble those of the lower division of the Road River 'Group', but weather to darker colours and can be distinguished by the presence of bedded barite or plant fragments. Unit emDpt is gradational with silty limestone of the underlying Road River Group over a 10 to 20 m interval in which thick beds of grey clastic, crinoidal limestone are interbedded with black shale.

Bedded barite occurs intermittently in one or more horizons. In most places the barite is less than a metre thick, but locally reaches 30 m. On the Cathy Property, the most notable occurrence, barite is interbedded with, and replaces lenses of massive grey limestone up to 30 m thick. Thick limestone horizons are unknown elsewhere within the unit.

In the west and central parts of the Central Block, unit emDpt is less than 5 m thick and is absent in most places. The abrupt thickness change is attributed to an unconformity beneath the overlying clastic rocks of unit emDps but facies changes with both under- and overlying rocks cannot be discounted.

The oldest conodonts from limestone near the base of unit emDpt are mid-Emsian. Givetian conodonts were obtained from barite on the Cathy Property by Dawson (in prep). Upper age limits are provided by Frasnian fossils from overlying units.

Unit muDps comprises the finer size fractions of the turbidite fan complex and includes units 1 and 3a of Carne (1979). It weathers brown and most rocks are dark grey "pinstriped" shale and silty shale. Chert quartz sandstone and grit are minor constituents concentrated in the upper part of the unit. The sandstone and grit are locally graded and display flute and groove casts.

Thickness changes are abrupt and profound. In the western half of the Central Block the unit varies from 0 to 50 m, but in the eastern half from 50 to 300 m.

Unit muDps overlies units emDpt, SDv and OSDpt sharply and unconformably. Fossils have not been obtained, but it is bracketed by fossiliferous units above and below which indicate it is late Middle or early Late Devonian.

Unit muDcg is a resistant, massive, grey weathering chert pebble conglomerate that is equivalent to unit 2 of Carne (1979). The conglomerate is remarkably uniform and contains rounded to angular pebbles and cobbles of grey, black, white or green chert and minor quartz sandstone in a clean matrix of quartz and chert sand. Contacts with enclosing rocks are sharp. Hand specimens and outcrops are massive and structureless, but the unit may be made up of a coalescing series of separate debris flows. The size and extent of individual flows is difficult to determine, because weathered surfaces are covered by lichen. The conglomerate forms a single regionally mappable horizon, 0 to 50 m below the top of unit muDps. Conglomerate mapped about 4 kilometres north of the Jason Property may be stratigraphically lower than most of unit muDcg, although repetition of strata by a fault is possible. Small conglomerate lenses less than a kilometre long and 15 m thick occur above the main horizon within tan and silver weathering shale, along the southern margin of the South Block 17 km west of the Jason Property (Section G-I). Breccias containing angular

fragments of black cherty argillite and chert in a muddy matrix are reported (Winn et al 1981) stratigraphically above and below unit muDcg on the Jason Property. These breccias are interpreted to be slumps derived from the scarp of an active fault nearby.

Unit muDcg varies in thickness from 10 to 300 m. It is thickest along the northern margin of the Central Block and thinnest along the southern margin.

The conglomerate underlies most of the Central Block, but depositional limits are uncertain. The unit is missing in the southeast corner of the map area and south of the Jason Property, and its absence elsewhere within the South Block is suggested by its thinness along the south margin of the Central Block. Along the northern margin of the Central Block, the conglomerate pinches out along section A-D. Elsewhere, the boundary is erosional, but the present limits may coincide with original depositional boundaries because a thick, competent unit like the conglomerate is unlikely to have been eroded from the North Block where older, less competent Middle Devonian shale and chert (emDpt) are preserved. Also, the abrupt change in style of deformation at the boundary is likely to reflect a difference in strata across it (Devonian conglomerate on southside) and/or a Devonian fault which could have influenced sedimentation.

The clastic facies of the Lower Earn Group (muDps, muDcg) may represent a single, elongate east-trending fan complex if present limits of exposure approximate depositional limits (Figure 5). In this interpretation the thick eastern parts of the finer-grained clastic rocks (muDps) represent the mid fan facies of the complex and the coarse clastic rock (muDcg) units proximal or channel facies. A westerly source is indicated by this facies configuration and because appropriate source rocks are more extensive west of the map-area than elsewhere. Easterly current directions reported by Winn et al (1982) from the finer grained clastic rocks on the Jason Property support this hypothesis.

Unit muDpt is equivalent to unit 3b of Carne (1979) and includes strata that overlie, and are lateral facies equivalents of, the clastic facies of the Lower Earn Group. In the Central Block, silver to blue-black weathering platy, graphitic, siliceous mudstone, siliceous shale and local chert sharply overlie the clastic facies (muDps, muDcg). Although similar to emDpt the mudstone weathers to more silvery colours and is less siliceous. Thicknesses range from 10 to 300 m and are greatest in the middle of the Central Block.

In the South Block, unit muDpt represents the Lower Earn Group and is in part time equivalent to strata of units muDcg and muDps. South and west of the Jason Deposits, light brown to silvery brown weathering black graphitic siliceous shale and silty shale makes up the lower half of the unit and silver to blue weathering black graphitic siliceous shale makes up the upper half for a total thickness of about 200 m. In the extreme southeast corner of the area mapped, a similar sequence is about 350 m thick. There, the lower division of light brown weathering, dark grey to black slate and minor siltstone appears to interfinger with the upper division of blue weathering siliceous shale and cherty argillite. The interfingering may be structural.

The lower brown weathering silty division in the South Block is probably equivalent to units muDcg and muDps. These rocks are included within Unit muDpt because they are most similar to the siliceous or cherty facies of the Earn Group and cannot be mapped separately.

Barite occurs intermittently near the top of unit muDpt in beds less than one meter thick. The lateral extent and continuity of these beds is uncertain.

Conodonts were collected from rare thin beds of platy coarse-grained black limestone in three localities within unit muDpt. Two of these collections are within 5 m of the top of the unit. One is Early Frasnian and the other is Middle Frasnian. The third, an unknown distance from the top, is Middle Frasnian.

This difference in age, and regional (Gordey et al, in press) and sedi-

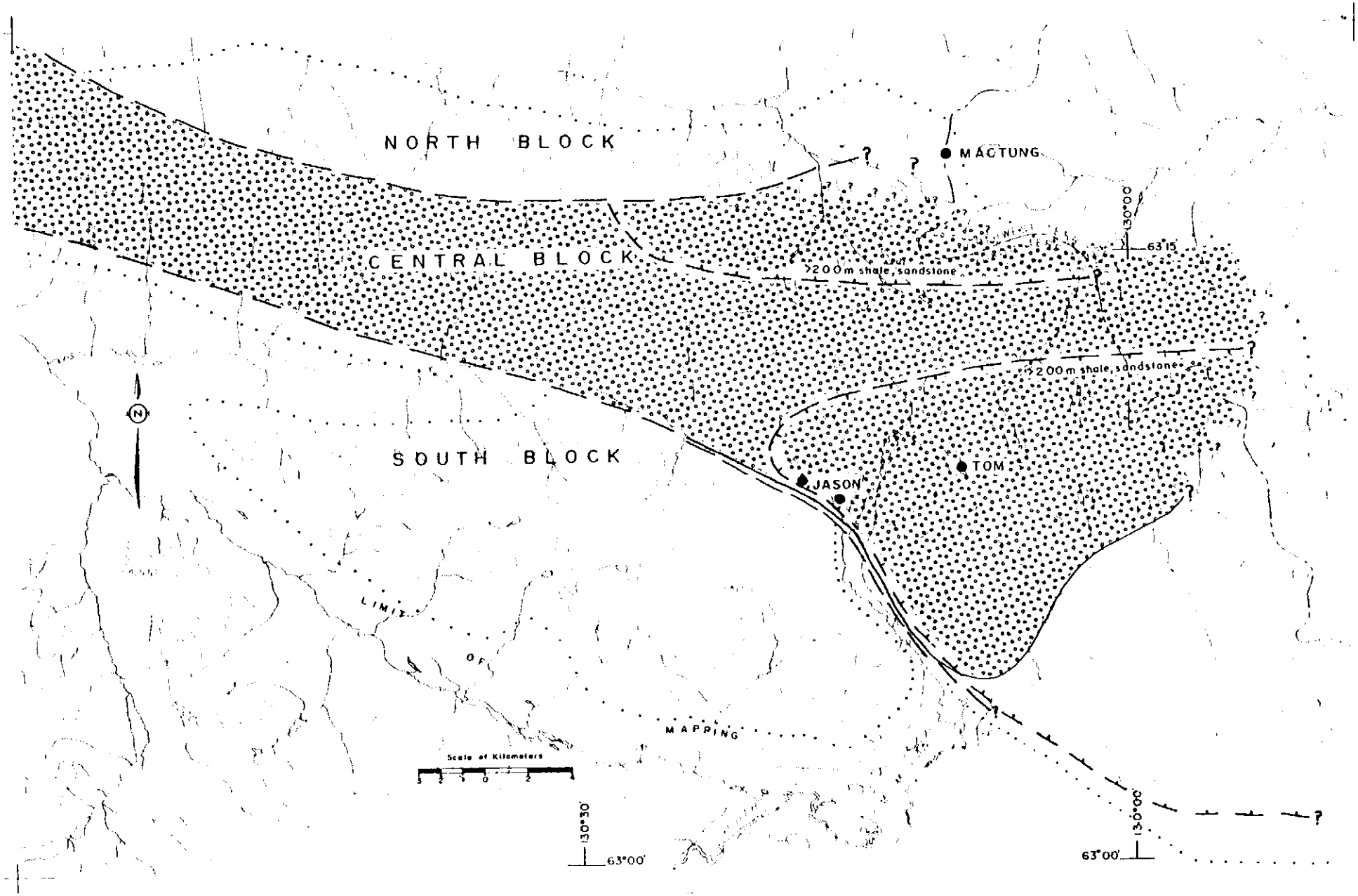

Figure 5: Approximate boundaries of the three blocks within MacMillan Fold Belt are shown by dashed lines. The Devonian submarine fan complex is confined to the Central Block. Small circles outline the present limit of exposure of chert conglomerate (muDcg). Known depositional limits are shown by a solid line. Finer grained clastic rocks (muDps) underlie the same area and extend farther southeast than the conglomerate. Hachured dashes outline areas where shale and sandstone are more than 200 m thick.

mentological evidence (Carne 1979) indicate that the upper contact of the Lower Earn Group is unconformable. The unconformity may account for some of the thickness variation of unit uDpt in the Central Block.

Upper Earn Group (Mps)

The upper Earn Group (Mps) includes three distinct subdivisions. The lowest, equivalent to unit 4 of Carne (1979), comprises resistant dark brown weathering, thin- to medium-bedded ripple crosslaminated and plane parallel laminated sandstone and siltstone with silty slate. Thickness varies from 135 m at the east end of the map-area to more than 450 m southwest of the Jason property. Cross lamination disappears as the sandstone becomes shalier and poorly bedded going westwards and was not observed west of Cross-Section A-D.

In the eastern part of the map-area, the ripple cross laminated division is overlain by a middle division of blue weathering, well bedded black slate 150 m thick. In the same area, the upper division consists of brown weathering well bedded black slate and silty slate more than 150 m thick. Recessive, poorly exposed blue and brown weathering black silty shale underlies a large part of the west end of the South Block and may be equivalent to either or both the upper and middle divisions.

An unconformity at the top of the Upper Earn Group is indicated by regional evidence (Gordey et al, in press) and locally by absence of the middle and upper divisions beneath upper Mississippian quartz arenite at the west end of the Central Block.

Conodonts collected from a 1 m thick limestone at the top of the middle division in the southeast corner of the map-area are Visean. This age and constraints provided by younger and older units indicate the upper Earn Group is Mississippian. It may also range into the latest Devonian.

Strata here included within the Lower and Upper Earn Group have been correlated by previous workers (Blusson, in Dawson, 1977, Carne 1979) with the Canol and Imperial Formations. This change in terminology has been proposed by Gordey et al (in press). The term Earn Group was formally introduced by Campbell for Devono-Mississippian strata in Glenlyon map-area (105 L) that are similar in lithology and age to those included within the Earn Group near MacMillan Pass.

Csp, Cq, Cl

The Upper Earn Group is unconformably overlain by an unnamed quartz arenite, sandstone, siltstone, shale and limestone sequence (Csp, Cq, Cl) 550 m thick. Brown weathering grey shale and silty shale, (Csp) which make up most of the unit can not be distinguished from parts of the Upper Earn Group, and the base of the sequence is mapped as the lowest quartz arenite. The quartz arenite is clean and well sorted, but grades to quartz sandstone with a dirty brown matrix. The quartz arenite and sandstone form well defined beds 30 cm to 30 m thick. Most are massive and structureless, but some thinner beds display flame structures and graded bedding.

In the Central Block, the unit includes grey to cream weathering, thick-bedded to massive limestone with abundant crinoid, coralline and shelly debris (Cl). The limestone is 300 m thick and is near the top of the sequence beneath an upper 20 m thick quartz arenite. The limestone is absent from the South Block and may change to shale there.

In the South Block, quartz arenite and sandstone are interbedded with shale in intervals up to 50 m thick at the base, near the middle and near the top of the sequence. Most finer-grained rocks are poorly exposed, brown weathering, thin-bedded, dark grey silty shale but the lower 50 m comprises

dark blue grey siliceous shale and cherty argillite. In the north part of the South Block, the three sandstone intervals are missing or thin and the finer-grained strata of unit Csp are not distinguished from those of the Upper Earn Group.

Conodonts from the limestone member of unit Cl are Chesterian and from underlying sandstone are late Visean. Regional correlation (Gordey et al, in press) indicates that the limestone is diachronous and ranges into the Pennsylvanian. Underlying and overlying units restrict possible assignments of units Csp, Cq and Cl to late Mississippian and Pennsylvanian.

Ppt

Resistant, orange brown weathering, thin- to medium-bedded green shale and chert more than 200 m thick (Ppt) underlie small parts of the South Block. The base of the unit is in sharp contact with older strata and comprises more than 50 m of green shale. Chert is common within the upper part of the unit.

Fossils were not obtained from the unit, but similar strata described by Gordey (1981) have yielded Permian fossils from limestone at the base of the chert. Gordey has included chert-bearing strata with the Fantasque Formation and underlying green shales with older unnamed Carboniferous strata equivalent to unit Cps. This division is not possible near MacMillan Pass where the green shales are like those interbedded with chert, but unlike the grey shales assigned to unit Cps.

Ŗs

Recessive, dull brown weathering thin-bedded to thinly laminated calcareous sandstone, siltstone and shale (Ŗs) that is considered Triassic underlies a small area within the South Block. Distinctive ripple crosslaminations less than 5 m thick are characteristic of the sandstones. Contacts are either covered or faulted, but the sequence exceeds 300 m in thickness.

Fossils were not obtained from the unit, but similar rocks in Nahanni map-area are Triassic (Gordey 1981). There, the Triassic rocks unconformably overlie Permian strata.

STRUCTURAL GEOLOGY

The North, Central and Southern "Blocks" of the MacMillan Fold Belt are characterized by structural styles that are as distinctive as their Devonian stratigraphy. Boundaries between blocks that are defined by stratigraphic differences generally correspond to those outlined by changes in deformation. The boundaries are sharp west of the Canol Road but more diffuse east of it.

In the North Block, closely spaced southerly directed imbricate thrust faults are the dominant structures. The faults trend north of east, dip moderately to steeply north-northwest and intersect the rib of chert conglomerate (muDcg) at the southern boundary of the block at acute angles. The amount of stratigraphic throw (and therefore displacement?) decreases to the west along each fault. At their western end, the faults tend to steepen and/or die out in the cores of tight anticlines. Bedding consistently dips north northwest and intersects thrusts at low angles. The thrusts bring rocks as old as Cambro-Ordovician and locally the "Grit Unit" (COpt) on to Early and Middle Devonian (emDpt) rocks with a probable stratigraphic omission of 1 km. The thrusts apparently cut strata at a constant angle and do not preferentially follow specific horizons. A detachment surface on which the thrusts root may be present, but has not been identified. If specific detachment surface(s) exist, it (they) must be within the "Grit Unit" or older strata. Tight to isoclinal

upright folds become prominent at the western and eastern ends of the North Block.

Within the Central Block, tight upright folds, high angle northerly directed reverse faults and irregularly oriented steeply dipping faults, some with unknown directions of throw, are typical. Folds in the western half trend west-northwest parallel to the MacMillan Fold Belt. At the east end, two sets of folds are superposed. Best developed and most extensive is a set that trends east-northeast; the other trends northwest. The second set appears to be the younger and consists of several large scale, open structures. The folds involve rocks as young as Mississippian and there is no evidence to indicate that the two sets of structures represent separate, unrelated periods of deformation.

High angle reverse faults appear to be geometrically and genetically related to the large scale folds. Most have small displacements relative to the lower angle southerly directed thrusts within the North Block.

Steep dipping faults occur throughout the Central Block in a variety of orientations. The faults cut the folds and reverse faults, and most are probably younger, but some appear to have influenced the development of these structures. In other words, folds on either side of some faults are not just offset, and cannot be matched across the normal fault. Thus folding may have proceeded independently on either side of a preexisting fault. These structures are best developed about 5 kilometres north of the Tom Deposit. They may be Devonian structures but are more likely tear faults that developed during later deformation as a result of abrupt variations in thickness of Devonian strata.

One fault that may have a Devonian component of movement is located on the Jason property along the boundary between the South and Central Blocks. There is no direct evidence, but the location and abrupt change in Devonian strata across it are compelling.

Within the South Block, large scale, tight, slightly northeast verging, northwest trending folds are characteristic. Normal faults that cut the folds are more systematic and less common than those within the Central Block. The faults are younger than, and unrelated, to the folds.

Most or all of the structures within the MacMillan Fold Belt appear to be related to regional Jura-Cretaceous deformation, but the marked contrast in structural style within the belt and coincident changes in Devonian stratigraphy indicate that deformation was influenced by Devonian faults. Faults rather than folds are probable because there is no local or regional evidence for Devonian folding, and strata within both the upper Road River and Lower Earn Groups could have been deposited within a rift or block faulting environment.

The complex and irregular structural pattern of the Central Block, in contrast to the relatively simple patterns of the North and South Blocks, indicates that Devonian faults are confined to it. Structure is complex throughout the Central Block, therefore it is probably composite and not just fault-bounded.

BARITE-LEAD-ZINC-SILVER DEPOSITS

Five sedimentary exhalative barite-lead-zinc-silver deposits are known within the Central Block on the Tom and Jason Properties. The deposits are described by Carne (1979) and Winn et al (1981) and were visited by the writer, but not examined in detail. At the Tom Property, the West and East Zones are exposed within a southerly plunging anticline. The West Zone is situated on the west limb of the anticline at the contact between sandstone and silty shale of unit muDps (unit 3a of Carne) and overlying blue weathering graphitic mudstone of unit muDpt (unit 3b of Carne). The East Zone is within the core of the anti-

cline. Underground exploration of the zone, during the past winter, has revealed that the hanging wall and footwall are steep north-trending faults. Mineralization is similar to that at the south end of the West Zone. These exposures and drill information indicate that the East Zone probably is the faulted extension of the West Zone as originally proposed by Carne (1979).

Winn reports that the three Jason deposits are exposed within a zone of complex southeast-trending vertical faults and folds. All deposits trend southeast and dip steeply. The Main Zone occurs at the same stratigraphic level as the Tom West Zone, but the End Zone is situated at the base of unit muDps. The South Zone may occur in unit muDps below the chert conglomerate (muDcg), but could also lie at the same stratigraphic horizon as the Main Zone.

Carne (1979) and Winn et al (1981) propose that the base metal deposits were precipitated on the sea floor in quiescent basins near active faults. Slump breccias within host rocks near the Jason Deposits may be indications of such faults. Other structural or stratigraphic features unique to the Tom and Jason deposits are absent. A connection between the deposits and the unusual features of the Central Block as a whole is implied and probable, and until the relationship between stratigraphy, structure and mineralization is clear, the entire Central Block is a favourable exploration target. Exploration should focus on the Devono-Mississippian Lower Earn Group but not on a specific stratigraphic horizon.

SUMMARY

The variations in Devonian stratigraphy and style of deformation between the three blocks comprising the MacMillan Fold Belt suggest that the Central Block was a zone of faulting throughout much of Devonian time. Stratigraphic evidence for faulting includes:

1. Abrupt thickness changes between the North and South Blocks, within the Early Devonian, upper part of the Road River 'Group'.

2. Middle Devonian volcaniclastic rocks confined to the Central Block.

3. Truncation of thick Middle Devonian chert and shale beneath an unconformity(?) in the South and Central Blocks.

4. Confinement of Devonian turbidites and related clastic rocks to the Central Block.

Structural evidence for faulting includes: the unusual westerly trend of the MacMillan Fold Belt across the regional structural grain and the complexity of deformation within the Central Block in contrast to relatively simple patterns in bounding blocks. The fact that structures are complex throughout the Central Block implies that it is a composite feature and not simply fault bounded.

Devonian sedimentary exhalative massive sulphide deposits are associated with clastic rocks of the Lower Earn Group within the Central Block. Few sedimentary or structural features unique to the deposits are known and the entire Central Block is considered to be a favourable exploration target.

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Indian and Northern Affairs Canada / Affaires indiennes et du Nord Canada

Military users, refer to this map as: / Référence de cette carte pour usage militaire:	SERIES A 701 SÉRIE
	MAP 105 P/5 CARTE
	EDITION 1 MCE ÉDITION

METRIC/MÉTRIQUE

63°30′ 25 20′ 63°15′

GEOLOGY

MacMillan Fold Belt

(parts of N.T.S. 105 O/8, 105 P/5)

Department of Indian Affairs and
Northern Development
200 Range Road
Whitehorse, Yukon

OPEN FILE
June 1983
1 of 3 sheets

$5.00

Acknowledgements

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Geology by Grant Abbott 1980, 1981, 1982.

LEGEND

CRETACEOUS

Kg Resistant, blocky, grey weathering porphyritic to equigranular biotite quartz monzonite and biotite granite.

TRIASSIC

Trs Recessive, dull brown weathering thin bedded to thinly laminated calcareous sandstone, and shale.

PERMIAN AND (?) PENNSYLVANIAN

CPpt Resistant, dark orange brown weathering interbedded greenish grey cherty shale and recessive green shale.

CARBONIFEROUS

Cl Grey weathering thick bedded to massive bioclastic limestone; minor quartz arenite and shale. Occurs within unit Csp.

Cq Dark grey weathering massive to thick bedded quartz arenite, thin to medium bedded sandstone and quartz arenite with shale interbeds. Occurs within unit Csp.

Csp Recessive, brown, blue brown and dark blue weathering silty shale, shale and siliceous shale with some beds of sandstone and quartz arenite.

MISSISSIPPIAN

UPPER EARN GROUP

Msp Resistant, brown weathering, thick bedded, parallel laminated and ripple cross laminated sandstone, siltstone and shale; In southwest 105 O/1 and southwest and central 105 O/2, brown weathering shale, siltstone and minor sandstone.

(?) MIDDLE AND UPPER DEVONIAN

LOWER EARN GROUP (uDpt - emDpt)

uDpt Talus forming, silver blue weathering, platey siliceous shale, minor chert and rare thin 2-5 cm thick beds of coarse grained limestone and platey grey weathering barite in beds less than 1 m thick.

muDcg Resistant, grey weathering massive chert pebble conglomerate, lesser well bedded chert conglomerate with sandstone and grit interbeds and local, abundant sandstone and grit, occurs within unit muDps.

muDps Brown weathering thinly laminated grey shale and siltstone with lesser chert quartz sandstone and grit and rare chert conglomerate.

LOWER AND MIDDLE DEVONIAN

emDcg Blue grey weathering chert conglomerate with minor sandstone and grit. Occurs within unit emDcg.

emDpt Black to dark blue weathering thin bedded chert, cherty argillite and siliceous shale. Light grey clastic limestone in beds 1 m thick or less near base and intermittent barite up to 30 m thick in 1 or more horizons may include Upper Devonian rocks in SW part of 105 O/12

SILURIAN AND DEVONIAN

SDv Orange weathering, carbonate rich mafic volcaniclastic rocks, and minor related sedimentary rocks. Local blocky, resistant dark grey weathering coarse grained mafic flows.

ORDOVICIAN, SILURIAN AND EARLY DEVONIAN

ROAD RIVER 'GROUP' (SIDl, Sp, OSpt) (OSDpt)

SIDl Buff to tan weathering platey, silty limestone, calcareous black shale. Locally includes lenses of massive grey limestone.

Sp Orange to green weathering bioturbated, wispy laminated green shale and mudstone.

OSpt Brown weathering, medium bedded chert overlain by silver to dark blue weathering, thin bedded black chert and siliceous shale.

CAMBRIAN AND LOWER ORDOVICIAN

ЄlOpl Near Mactung and further east and northeast. Bluebrown weathering siliceous shale with minor limestone and limestone conglomerate. The shale is bounded by distinct limestone horizons; The lower is intermittent orange weathering unit of thin bedded grey limestone and limestone conglomerate. The upper is grey weathering thin bedded grey silty limestone, minor limestone and grey shale interbeds. West and Southwest of Mactung. Brown weathering, finely laminated grey and green shale with thin interbeds of grey limestone and some limestone conglomerate. Orange and grey weathering, thick bedded grey limestone occurs locally at the top.

(?) HADRYNIAN AND LOWER CAMBRIAN

HЄps Dark brown and grey weathering grey shale, siltstone and minor sandstone.

HЄp 'Grit Unit'; maroon, green and brown weathering shale, minor quartz grit and sandstone.

MAP SYMBOLS

geological contact, defined approximate, assumed

fault, defined, approximate, (sense of movement not known)

normal fault; defined, approximate

reverse fault; defined, approximate (dip less than 45°)

reverse fault; defined, approximate (dip greater than 45°)

limit of outcrop

limit of mapping

bedding; inclined, vertical, horizontal, overturned.

cleavage; inclined, vertical (includes more than one phase)

trend of fold axis (includes more than one phase)

syncline; defined, approximate

anticline, defined, approximate

overturned anticline, defined, approximate

overturned syncline; defined, approximate

bedded barite; metaliferous and barren

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LEGEND - LÉGENDE

ROAD HARD SURFACE ALL WEATHER — ROUTE SURFACE DURCIE TOUTES SAISONS
ROAD LOOSE SURFACE — ROUTE SURFACE DE GRAVIER
CART TRACK, WINTER ROAD — CHEMIN DE CHARROI, ROUTE D'HIVER
TRAIL, CUT LINE, PORTAGE — SENTIER, PERCÉE OU PORTAGE
BUILT-UP AREA — AGGLOMÉRATION
RAILWAY SIDING STATION STOP — CHEMIN DE FER VOIE D'ÉVITEMENT; STATION; ARRÊT
BRIDGE — PONT
SEAPLANE BASE SEAPLANE ANCHORAGE — BASE D'HYDRAVIONS ANCRAGE D'HYDRAVIONS
HOUSE BARN — MAISON GRANGE
CHURCH SCHOOL POST OFFICE — ÉGLISE; ÉCOLE; BUREAU DE POSTE
TOWER FIRE COMMUNICATION — TOUR FEU COMMUNICATION
WELL OIL GAS TANK WATER — PUITS PÉTROLE GAZ; RÉSERVOIR: EAU
POWER TRANSMISSION LINE — LIGNE DE TRANSPORT D'ÉNERGIE
MINE GRAVEL PIT — MINE CARRIÈRE DE GRAVIER
CUTTING EMBANKMENT — DÉBLAI; REMBLAI
INTERNATIONAL PROVINCIAL BOUNDARY WITH MONUMENT — FRONTIÈRE INTERNATIONALE; LIMITE PROVINCIALE AVEC BORNE
PROVINCIAL BOUNDARY UNSURVEYED — FRONTIÈRE PROVINCIALE, NON ARPENTÉE
COUNTY DISTRICT BOUNDARY — LIMITE DE COMTÉ OU DE DISTRICT
TOWNSHIP PARISH BOUNDARY — LIMITE DE CANTON, DE PAROISSE
MUNICIPALITY BOUNDARY — LIMITE DE MUNICIPALITÉ
RESERVE SANCTUARY PARK ETC BOUNDARY — LIMITE DE RÉSERVE SANCTUAIRES, PARCS, ETC
OUTLINED LANDMARK AREA BOUNDARY APPROXIMATE ETC — LIMITE DE SURFACE REPÈRE LIMITE APPROXIMATIVE, ETC
TOWNSHIP CORNER SURVEYED UNSURVEYED — COIN DE CANTON (A T C) ARPENTÉ NON ARPENTÉ
SECTION CORNERS — COINS DE SECTION (A T C)
HORIZONTAL CONTROL POINT — POINT DE CONTRÔLE PLANIMÉTRIQUE
BENCH MARK WITH ELEVATION — REPÈRE DE NIVELLEMENT AVEC COTE
SPOT ELEVATION PRECISE — POINT COTÉ PRÉCIS
STREAM OR SHORELINE INDEFINITE — COURS D'EAU OU RIVE IMPRÉCIS
LAKE INTERMITTENT LAKES — LAC, LACS INTERMITTENT
FLOODED LAND — TERRAIN INONDÉ
MARSH SWAMP WOODED STRING BOG — MARAIS BOISÉ MARÉCAGEUX; FONDRIÈRE À FILAMENTS
DRY RIVER BED WITH CHANNELS — LIT DE RIVIÈRE ASSÉCHÉ AVEC CHENAUX
RAPIDS FALLS RAPIDS — RAPIDES CHUTES RAPIDES
FORESHORE FLATS SAND IN WATER ROCKS — ESTRANS SABLE SOUS L'EAU; ROCHES
TUNDRA LAKES IN TUNDRA POLYGONS — TOUNDRA LACS EN TOUNDRA POLYGONES DE TOUNDRA
PALSA BOG RAISED BEACHES — FONDRIÈRE DE PALSE PLAGES SURÉLEVÉES
DAM WHARF — BARRAGE QUAI
GLACIER MORAINE — CHAMP DE GLACE (GLACIER), MORAINE
PINGO — PINGO
FOSSÉ
COURBES DE NIVEAU
COURBES DE NIVEAU APPROXIMATIVES
COURBE DE CUVETTE
FALAISE
SPOT ELEVATION APPROXIMATE LAND WATER — POINT COTÉ APPROXIMATIF SUR TERRE SUR L'EAU
ESKER
SABLE, DUNES DE SABLE
LIEU HISTORIQUE
SURFACE BOISÉE FORÊT ESPACE DÉNUDÉ CLAIRIÈRE

GLOSSARY-GLOSSAIRE

ONE THOUSAND METRE UNIVERSAL TRANSVERSE MERCATOR GRID ZONE 9 QUADRILLAGE DE MILLE MÈTRES TRANSVERSE UNIVERSEL DE MERCATOR

105-O/9	105 P/12	105 P/11
105-O/8	105 P/5	105 P/6
105-O/1	105 P/4	105 P/3

130°30′ 25′ 20′ 15′ 10′ 05′ MACMILLAN PASS AIRFIELD 130°00′ 55′ 50′ 45′ 40′ 35′ 129°30′

PRODUCED BY THE SURVEYS AND MAPPING BRANCH DEPARTMENT OF ENERGY, MINES AND RESOURCES OTTAWA PUBLISHED IN 1982

COPIES MAY BE OBTAINED FROM THE CANADA MAP OFFICE DEPARTMENT OF ENERGY, MINES AND RESOURCES OTTAWA OR YOUR NEAREST MAP DEALER

Canada

ELEVATIONS IN METRES ABOVE MEAN SEA LEVEL
CONTOUR INTERVAL 20 METRES
NORTH AMERICAN DATUM 1927
TRANSVERSE MERCATOR PROJECTION

INFORMATION CONCERNING LOCATION AND PRECISE ELEVATION OF BENCH MARKS CAN BE OBTAINED BY WRITING TO THE GEODETIC SURVEY, SURVEYS AND MAPPING BRANCH, OTTAWA

KEELE PEAK

YUKON TERRITORY - NORTHWEST TERRITORIES

Scale 1:50 000 Échelle

Miles 1 0 1 2 3 Milles
Metres 1000 0 1000 2000 3000 4000 Metres
Yards 1000 0 1000 2000 3000 4000 Verges

ALTITUDES EN MÈTRES
ÉQUIDISTANCE DES COURBES 20 MÈTRES
SYSTÈME DE RÉFÉRENCE GÉODÉSIQUE NORD-AMÉRICAIN 1927
PROJECTION TRANSVERSE DE MERCATOR

ON PEUT OBTENIR DES RENSEIGNEMENTS SUR LE LIEU ET L'ALTITUDE EXACTE DES REPÈRES DE NIVELLEMENT EN ÉCRIVANT AUX LEVÉS GÉODÉSIQUES, DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, OTTAWA

ÉTABLIE PAR LA DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES, OTTAWA, PUBLIÉE EN 1982

CES CARTES SONT EN VENTE AU BUREAU DES CARTES DU CANADA, MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES, OTTAWA, OU CHEZ LE VENDEUR LE PLUS PRÈS

ELEVATIONS IN METRES ABOVE MEAN SEA LEVEL
CONTOUR INTERVAL 20 METRES
NORTH AMERICAN DATUM 1927
TRANSVERSE MERCATOR PROJECTION

INFORMATION CONCERNING BENCH MARKS AND HORIZONTAL SURVEY MONUMENTS CAN BE OBTAINED FROM GEODETIC SURVEY, SURVEYS AND MAPPING BRANCH OTTAWA

NORTHWEST TERRITORIES–YUKON TERRITORY

Scale 1:50 000 Échelle

ALTITUDES EN METRES
EQUIDISTANCE DES COURBES 20 METRES

POUR TOUT RENSEIGNEMENT CONCERNANT LES REPÈRES ET BORNES ALTIMÉTRIQUES, S'ADRESSER AUX LEVÉS GÉODÉSIQUES, DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, OTTAWA

CONVERSION SCALE FOR ELEVATIONS — ÉCHELLE DE CONVERSION DES ALTITUDES

105 P/5
EDITION 1 ÉDITION

Indian and Northern Affairs Canada | Affaires indiennes et du Nord Canada

105-O/1 EDITION 1 **METRIC** **MÉTRIQUE** ÉDITION 1 105-O/1|105 P/4 EDITION 1 **METRIC** 105 P/4

TSICHU RIVER AIRFIELD 12 KM

GEOLOGY

MacMillan Fold Belt

(parts of N.T.S. 105 O/1, 105 P/4)

Department of Indian Affairs and Northern Development
200 Range Road
Whitehorse, Yukon

OPEN FILE
June 1983
1 of 3 sheets
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Kg — Resistant, blocky, grey weathering porphyritic to equigranular biotite quartz monzonite and biotite granite.

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Trs — Recessive, dull brown weathering thin bedded to thinly laminated calcareous sandstone, and shale.

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CPpt — Resistant, dark orange brown weathering interbedded greenish grey cherty shale and recessive green shale.

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MISSISSIPPIAN

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muDps — Brown weathering thinly laminated grey shale and siltstone with lesser chert quartz sandstone and grit and rare chert conglomerate.

LOWER AND MIDDLE DEVONIAN

emDcg — Blue grey weathering chert conglomerate with minor sandstone and grit. Occurs within unit emDcg.

emDpt — Black to dark blue weathering thin bedded chert, cherty argillite and siliceous shale. Light grey clastic limestone in beds 1 m thick or less near base and intermittent barite up to 30 m thick in 1 or more horizons may include Upper Devonian rocks in SW part of 105 O/12.

SILURIAN AND DEVONIAN

SDv — Orange weathering, carbonate rich mafic volcaniclastic rocks, and minor related sedimentary rocks. Local blocky, resistant dark grey weathering coarse grained mafic flows.

ORDOVICIAN, SILURIAN AND EARLY DEVONIAN

ROAD RIVER 'GROUP' (SlDl, Sp, OSpt) — OSDpl

SlDl — Buff to tan weathering platey, silty limestone, calcareous black shale. Locally includes lenses of massive grey limestone.

Sp — Orange to green weathering bioturbated, wispy laminated green shale and mudstone.

OSpt — Brown weathering, medium bedded chert overlain by silver to dark blue weathering, thin bedded black chert and siliceous shale.

CAMBRIAN AND LOWER ORDOVICIAN

ClOpl — Near Mactung and further east and northeast. Bluebrown weathering siliceous shale with minor limestone and limestone conglomerate. The shale is bounded by distinct limestone horizons; The lower is intermittent orange weathering unit of thin bedded grey limestone and limestone conglomerate. The upper is grey weathering thin bedded grey silty limestone, minor limestone and grey shale interbeds. West and Southwest of Mactung. Brown weathering, finely laminated grey and green shale with thin interbeds of grey limestone and some limestone conglomerate. Orange and grey weathering, thick bedded grey limestone occurs locally at the top.

(?) HADRYNIAN AND LOWER CAMBRIAN

HlCps — Dark brown and grey weathering grey shale, siltstone and minor sandstone.

HlCp — 'Grit Unit'; maroon, green and brown weathering shale, minor quartz grit and sandstone.

MAP SYMBOLS

- geological contact, defined approximate, assumed
- fault; defined, approximate; (sense of movement not known)
- normal fault; defined, approximate
- reverse fault; defined, approximate (dip less than 45°)
- reverse fault; defined, approximate (dip greater than 45°)
- limit of outcrop
- limit of mapping
- bedding; inclined, vertical, horizontal, overturned.
- cleavage; inclined, vertical (includes more than one phase)
- trend of fold axis (includes more than one phase)
- syncline; defined, approximate
- anticline, defined, approximate
- overturned anticline, defined, approximate
- overturned syncline; defined, approximate
- bedded barite; metaliferous and barren

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Military users, refer to this map as / Reference de cette carte pour usage militaire	SERIES A 701 SERIE
	MAP 105 P 4 CARTE
	EDITION 1 MCE EDITION

LEGEND - LÉGENDE

ROAD HARD SURFACE ALL WEATHER	ROUTE SURFACE DURCIE TOUTES SAISONS
ROAD LOOSE SURFACE	ROUTE SURFACE DE GRAVIER
CART TRACK WINTER ROAD	CHEMIN DE CHARROI ROUTE D HIVER
TRAIL CUT LINE PORTAGE	SENTIER PERCEE OU PORTAGE
BUILT-UP AREA	AGGLOMERATION
RAILWAY SIDING STATION STOP	CHEMIN DE FER VOIE D EVITEMENT STATION ARRÊT
BRIDGE	PONT
SEAPLANE BASE SEAPLANE ANCHORAGE	BASE D HYDRAVIONS ANCRAGE D HYDRAVIONS
HOUSE BARN	MAISON GRANGE
CHURCH SCHOOL POST OFFICE	EGLISE ECOLE BUREAU DE POSTE
TOWER FIRE COMMUNICATION	TOUR FEU COMMUNICATION
WELL OIL GAS TANK WATER	PUITS PETROLE GAZ RESERVOIR EAU
POWER TRANSMISSION LINE	LIGNE DE TRANSPORT D ENERGIE
MINE GRAVEL PIT	MINE CARRIERE DE GRAVIER
CUTTING EMBANKMENT	DEBLAI REMBLAI
INTERNATIONAL PROVINCIAL BOUNDARY WITH MONUMENT	FRONTIERE INTERNATIONALE LIMITE PROVINCIALE AVEC BORNE
PROVINCIAL BOUNDARY UNSURVEYED	FRONTIERE PROVINCIALE NON ARPENTE
COUNTY DISTRICT BOUNDARY	LIMITE DE COMTE OU DE DISTRICT
TOWNSHIP PARISH BOUNDARY	LIMITE DE CANTON DE PAROISSE
MUNICIPALITY BOUNDARY	LIMITE DE MUNICIPALITE
RESERVE SANCTUARY PARK ETC BOUNDARY	LIMITE DE RESERVE SANCTUAIRES PARCS ETC
OUTLINED LANDMARK AREA BOUNDARY APPROXIMATE ETC	LIMITE DE SURFACE REPERE LIMITE APPROXIMATIVE ETC
D L S TOWNSHIP CORNER SURVEYED UNSURVEYED	COIN DE CANTON A T C ARPENTE NON ARPENTE
D L S SECTION CORNERS	COINS DE SECTION A T C
HORIZONTAL CONTROL POINT	POINT DE CONTROLE PLANIMETRIQUE
BENCH MARK WITH ELEVATION	REPERE DE NIVELLEMENT AVEC COTE
SPOT ELEVATION PRECISE	POINT COTE PRECIS
STREAM OR SHORELINE INDEFINITE	COURS D EAU OU RIVE IMPRECIS
LAKE INTERMITTENT LAKES	LAC LACS INTERMITTENT
FLOODED LAND	TERRAIN INONDE
MARSH SWAMP WOODED STRING BOG	MARAIS BOISE MARECAGEUX FONDRIERE A FILAMENTS
DRY RIVER BED WITH CHANNELS	LIT DE RIVIERE ASSECHE AVEC CHENAUX
RAPIDS FALLS RAPIDS	RAPIDES CHUTES RAPIDES
FORESHORE FLATS SAND IN WATER ROCKS	ESTRANS SABLE SOUS L EAU ROCHES
TUNDRA LAKES IN TUNDRA POLYGONS	TOUNDRA LACS EN TOUNDRA POLYGONES DE TOUNDRA
PALSA BOG RAISED BEACHES	FONDRIERE DE PALSE PLAGES SURELEVEES
DAM WHARF	BARRAGE QUAI
ICEFIELD GLACIER MORAINE	CHAMP DE GLACE GLACIER MORAINE
PINGO	PINGO
DITCH	FOSSE
CONTOURS	COURBES DE NIVEAU
APPROXIMATE CONTOURS	COURBES DE NIVEAU APPROXIMATIVES
DEPRESSION CONTOUR	COURBE DE CUVETTE
CLIFF	FALAISE
SPOT ELEVATION APPROXIMATE LAND WATER	POINT COTE APPROXIMATIF SUR TERRE SUR L EAU
ESKER	ESKER
SAND SAND DUNES	SABLE DUNES DE SABLE
HISTORIC SITE	LIEU HISTORIQUE
WOODED AREA FOREST CLEARED AREA	SURFACE BOISEE FORET ESPACE DENUDE CLAIRIERE

GLOSSARY-GLOSSAIRE

POSITION APPROXIMATE — POSITION APPROXIMATIVE

METRIC/MÉTRIQUE

AIR PHOTOGRAPHY - PHOTOGRAPHIE: COMPILATION — RESTITUTION

REVISION — REVISION

GRID ZONE DESIGNATION / DESIGNATION DE LA ZONE DU QUADRILLAGE: 9V — 100 000 m SQUARE IDENTIFICATION / IDENTIFICATION DU CARRE DE 100 000 m: VA, VV

EXAMPLE OF METHOD USED TO GIVE A REFERENCE TO NEAREST 100 METRES / EXEMPLE DE LA METHODE EMPLOYEE POUR FIXER DES REPERES A 100 METRES PRES

REFERENCE POINT / POINT DE REPERE: CHURCH - EGLISE

EASTING Read number on grid line immediately to left of point — ABSCISSE Noter le chiffre de la ligne du quadrillage immédiatement à gauche du repère — 97
Estimate tenths of a square from this line eastward to point — Estimer le nombre de dixièmes du carré entre cette ligne et le repère en direction est — 5 — 975
NORTHING Read number on grid line immediately below point — ORDONNEE Noter le chiffre de la ligne du quadrillage immédiatement en dessous du repère — 98
Estimate tenths of a square from this line northward to point — Estimer le nombre de dixièmes du carré entre cette ligne et le repère en direction nord — 4 — 984
GRID REFERENCE / REFERENCE AU QUADRILLAGE — 975984
Nearest similar grid reference 100 000 metres / La prochaine référence similaire est à 100 000 mètres

ONE THOUSAND METRE UNIVERSAL TRANSVERSE MERCATOR GRID ZONE 9
QUADRILLAGE DE MILLE MÈTRES TRANSVERSE UNIVERSEL DE MERCATOR

105-O/8	105 P/5	105 P/6
105-O/1	105 P/4	105 P/3
105 J/16	105-I/13	105-I/14

The 1983 MAGNETIC BEARING is 33°48' (601 mils) EAST of GRID NORTH
ANNUAL CHANGE DECREASING 6.4'
GRID NORTH is 0°40' (12 mils) WEST of TRUE NORTH for centre of map.

Le REPÈRE MAGNÉTIQUE en 1983 est à 33°48' (601 mils) à l'EST du NORD DU QUADRILLAGE.
VARIATION ANNUELLE DÉCROISSANTE 6.4'
NORD DU QUADRILLAGE est à 0°40' (12 mils) à l'OUEST du NORD GÉOGRAPHIQUE au centre de la carte.

CONVERSION SCALE FOR ELEVATIONS — ECHELLE DE CONVERSION DES ALTITUDES

63°15' 10' 05' 63°00'

130°30' ROSS RIVER 165 KM 25' 20' 15' 10' 05' 130°00' 55' 50' 45' 40' 35' 129°30'

PRODUCED BY THE SURVEYS AND MAPPING BRANCH, DEPARTMENT OF ENERGY, MINES AND RESOURCES, OTTAWA. PUBLISHED IN 1982.

COPIES MAY BE OBTAINED FROM THE CANADA MAP OFFICE, DEPARTMENT OF ENERGY, MINES AND RESOURCES, OTTAWA OR YOUR NEAREST MAP DEALER.

ELEVATIONS IN METRES ABOVE MEAN SEA LEVEL
CONTOUR INTERVAL .... 20 METRES
NORTH AMERICAN DATUM 1927
TRANSVERSE MERCATOR PROJECTION

INFORMATION CONCERNING LOCATION AND PRECISE ELEVATION OF BENCH MARKS CAN BE OBTAINED BY WRITING TO THE GEODETIC SURVEY, SURVEYS AND MAPPING BRANCH, OTTAWA.

YUKON TERRITORY-NORTHWEST TERRITORIES

Scale 1:50 000 Échelle

ALTITUDES EN MÈTRES
ÉQUIDISTANCE DES COURBES .... 20 MÈTRES
SYSTÈME DE RÉFÉRENCE GÉODÉSIQUE NORD-AMÉRICAIN 1927
PROJECTION TRANSVERSE DE MERCATOR

ON PEUT OBTENIR DES RENSEIGNEMENTS SUR LE LIEU ET L'ALTITUDE EXACTE DES REPÈRES DE NIVELLEMENT EN ÉCRIVANT AUX LEVÉS GÉODÉSIQUES, DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, OTTAWA.

ÉTABLIE PAR LA DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES, OTTAWA. PUBLIÉE EN 1982.

CES CARTES SONT EN VENTE AU BUREAU DES CARTES DU CANADA, MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES, OTTAWA, OU CHEZ LE VENDEUR LE PLUS PRÈS.

© 1982 SA MAJESTÉ LA REINE DU CHEF DU CANADA. MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES.

ELEVATIONS IN METRES ABOVE MEAN SEA LEVEL
CONTOUR INTERVAL .... 20 METRES

INFORMATION CONCERNING BENCH MARKS AND HORIZONTAL SURVEY MONUMENTS CAN BE OBTAINED FROM GEODETIC SURVEY, SURVEYS AND MAPPING BRANCH, OTTAWA.

CHRISTIE PASS

NORTHWEST TERRITORIES - YUKON TERRITORIES

Scale 1:50 000 Échelle

POUR TOUT RENSEIGNEMENT CONCERNANT LES REPÈRES ET BORNES ALTIMÉTRIQUES, S'ADRESSER AUX LEVÉS GÉODÉSIQUES, DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, OTTAWA.

CHRISTIE PASS
105 P/4
EDITION 1 ÉDITION

Canada

Indian and Northern Affairs Canada / Affaires indiennes et du Nord Canada

Military users, refer to this map as: / Référence de cette carte pour usage militaire:	SERIES A 701 SÉRIE
	MAP 105-O/7 CARTE
	EDITION 1 MCE ÉDITION

GEOLOGY

MacMillan Fold Belt

(parts of N.T.S. 105 O/2, 105 O/7)

Department of Indian Affairs and Northern Development
200 Range Road
Whitehorse, Yukon

OPEN FILE
June 1983
1 of 3 sheets
$5.00

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Geology by Grant Abbott 1980, 1981, 1982.

LEGEND

CRETACEOUS

Kg — Resistant, blocky, grey weathering porphyritic to equigranular biotite quartz monzonite and biotite granite.

TRIASSIC

Ts — Recessive, dull brown weathering thin bedded to thinly laminated calcareous sandstone, and shale.

PERMIAN AND (?) PENNSYLVANIAN

CPpt — Resistant, dark orange brown weathering interbedded greenish grey cherty shale and recessive green shale.

CARBONIFEROUS

Cl — Grey weathering thick bedded to massive bioclastic limestone; minor quartz arenite and shale. Occurs within unit Csp.

Cq — Dark grey weathering massive to thick bedded quartz arenite, thin to medium bedded sandstone and quartz arenite with shale interbeds. Occurs within unit Csp.

Csp — Recessive, brown, blue brown and dark blue weathering silty shale, shale and siliceous shale with some beds of sandstone and quartz arenite.

MISSISSIPPIAN

UPPER EARN GROUP

Msp — Resistant, brown weathering, thick bedded, parallel laminated and ripple cross laminated sandstone, siltstone and shale; in southwest 105 O/1 and southwest and central 105 O/2, brown weathering shale, siltstone and minor sandstone.

(?) MIDDLE AND UPPER DEVONIAN

LOWER EARN GROUP (uDpt - emDpt)

uDpt — Talus forming, silver blue weathering, platey siliceous shale, minor chert and rare thin 2-5 cm thick beds of coarse-grained limestone and platey grey weathering barite in beds less than 1 m thick.

muDcg — Resistant, grey weathering massive chert pebble conglomerate, lesser well bedded chert conglomerate with sandstone and grit interbeds and local, abundant sandstone and grit, occurs within unit muDps.

muDps — Brown weathering thinly laminated grey shale and siltstone with lesser chert quartz sandstone and grit and rare chert conglomerate.

LOWER AND MIDDLE DEVONIAN

emDcg — Blue grey weathering chert conglomerate with minor sandstone and grit. Occurs within unit emDcg.

emDpt — Black to dark blue weathering thin bedded chert, cherty argillite and siliceous shale. Light grey clastic limestone in beds 1 m thick or less near base and intermittent barite up to 30 m thick in 1 or more horizons may include Upper Devonian rocks in SW part of 105 O/12

SILURIAN AND DEVONIAN

SDv — Orange weathering, carbonate rich mafic volcaniclastic rocks, and minor related sedimentary rocks. Local blocky, resistant dark grey weathering coarse grained mafic flows.

ORDOVICIAN, SILURIAN AND EARLY DEVONIAN

ROAD RIVER 'GROUP' (SlDl, Sp, OSpt)

SlDl — Buff to tan weathering platey, silty limestone, calcareous black shale. Locally includes lenses of massive grey limestone.

Sp — Orange to green weathering bioturbated, wispy laminated green shale and mudstone.

OSpt — Brown weathering, medium bedded chert overlain by silver to dark blue weathering, thin bedded black chert and siliceous shale.

(OSDpt)

CAMBRIAN AND LOWER ORDOVICIAN

ClOpl — Near Mactung and further east and northeast. Bluebrown weathering siliceous shale with minor limestone and limestone conglomerate. The shale is bounded by distinct limestone horizons; The lower is intermittent orange weathering unit of thin bedded grey limestone and limestone conglomerate. The upper is grey weathering thin bedded grey silty limestone, minor limestone and grey shale interbeds. West and Southwest of Mactung. Brown weathering, finely laminated grey and green shale with thin interbeds of grey limestone and some limestone conglomerate. Orange and grey weathering, thick bedded grey limestone occurs locally at the top.

(?) HADRYNIAN AND LOWER CAMBRIAN

HlCps — Dark brown and grey weathering grey shale, siltstone and minor sandstone

HlCp — 'Grit Unit', maroon, green and brown weathering shale, minor quartz grit and sandstone.

MAP SYMBOLS

- geological contact, defined approximate, assumed
- fault; defined, approximate, (sense of movement not known)
- normal fault; defined, approximate
- reverse fault; defined, approximate (dip less than 45°)
- reverse fault; defined, approximate (dip greater than 45°)
- limit of outcrop
- limit of mapping
- bedding; inclined, vertical, horizontal, overturned.
- cleavage; inclined, vertical (includes more than one phase)
- trend of fold axis (includes more than one phase)
- syncline; defined, approximate
- anticline, defined, approximate
- overturned anticline, defined, approximate
- overturned syncline; defined, approximate
- bedded barite; metalliferous and barren

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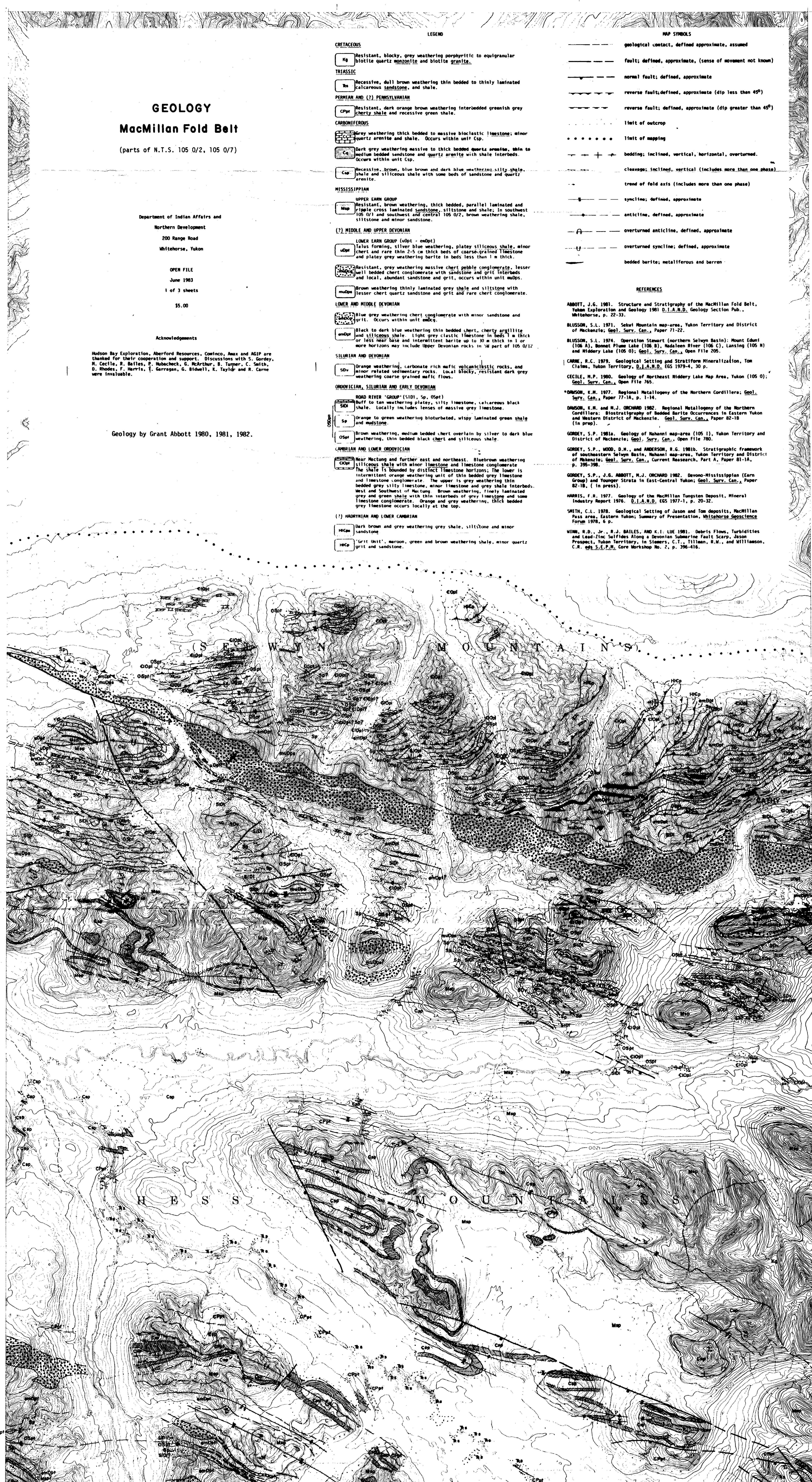

LEGEND - LÉGENDE

ROAD HARD SURFACE ALL WEATHER	ROUTE SURFACE DURCIE TOUTES SAISONS
ROAD LOOSE SURFACE	ROUTE, SURFACE DE GRAVIER
CART TRACK WINTER ROAD	CHEMIN DE CHARROI, ROUTE D'HIVER
TRAIL CUT LINE PORTAGE	SENTIER, PERCÉE OU PORTAGE
BUILT-UP AREA	AGGLOMÉRATION
RAILWAY SIDING STATION STOP	CHEMIN DE FER, VOIE D'ÉVITEMENT; STATION; ARRÊT
BRIDGE	PONT
SEAPLANE BASE, SEAPLANE ANCHORAGE	BASE D'HYDRAVIONS; ANCRAGE D'HYDRAVIONS
HOUSE, BARN	MAISON; GRANGE
CHURCH SCHOOL POST OFFICE	ÉGLISE; ÉCOLE; BUREAU DE POSTE
TOWER FIRE COMMUNICATION	TOUR FEU, COMMUNICATION
WELL OIL GAS TANK WATER	PUITS: PÉTROLE, GAZ, RÉSERVOIR: EAU
POWER TRANSMISSION LINE	LIGNE DE TRANSPORT D'ÉNERGIE
MINE GRAVEL PIT	MINE; CARRIÈRE DE GRAVIER
CUTTING EMBANKMENT	DÉBLAI; REMBLAI
INTERNATIONAL, PROVINCIAL BOUNDARY WITH MONUMENT	FRONTIÈRE INTERNATIONALE, LIMITE PROVINCIALE AVEC BORNE
PROVINCIAL BOUNDARY UNSURVEYED	FRONTIÈRE PROVINCIALE, NON ARPENTÉE
COUNTY DISTRICT BOUNDARY	LIMITE DE COMTÉ OU DE DISTRICT
TOWNSHIP PARISH BOUNDARY	LIMITE DE CANTON, DE PAROISSE
MUNICIPALITY BOUNDARY	LIMITE DE MUNICIPALITÉ
RESERVE SANCTUARY PARK ETC BOUNDARY	LIMITE DE RÉSERVE, SANCTUAIRES, PARCS, ETC.
OUTLINED LANDMARK AREA BOUNDARY APPROXIMATE ETC.	LIMITE DE SURFACE REPÈRE, LIMITE APPROXIMATIVE, ETC.
D.L.S. TOWNSHIP CORNER SURVEYED UNSURVEYED	COIN DE CANTON (A.T.C.) ARPENTÉ; NON ARPENTÉ
D.L.S. SECTION CORNERS	COINS DE SECTION (A.T.C.)
HORIZONTAL CONTROL POINT	POINT DE CONTRÔLE PLANIMÉTRIQUE
BENCH MARK WITH ELEVATION (365)	REPÈRE DE NIVELLEMENT AVEC COTE
SPOT ELEVATION PRECISE (397)	POINT COTÉ, PRÉCIS
STREAM OR SHORELINE INDEFINITE	COURS D'EAU OU RIVE, IMPRÉCIS
LAKE INTERMITTENT LAKES	LAC; LACS INTERMITTENT
FLOODED LAND	TERRAIN INONDÉ
MARSH SWAMP (WOODED) STRING BOG	MARAIS; BOISÉ MARÉCAGEUX; FONDRIÈRE À FILAMENTS
DRY RIVER BED WITH CHANNELS	LIT DE RIVIÈRE ASSÉCHÉ AVEC CHENAUX
RAPIDS FALLS RAPIDS	RAPIDES; CHUTES; RAPIDES
FORESHORE FLATS SAND IN WATER ROCKS	ESTRANS, SABLE SOUS L'EAU; ROCHES
TUNDRA LAKES IN TUNDRA POLYGONS (LT, PG)	TOUNDRA LACS EN TOUNDRA, POLYGONES DE TOUNDRA
PALSA BOG RAISED BEACHES (PA, RB)	FONDRIÈRE DE PALSE, PLAGES SURÉLEVÉES
DAM WHARF	BARRAGE; QUAI
ICEFIELD (GLACIER) MORAINE (IF, M)	CHAMP DE GLACE (GLACIER); MORAINE
PINGO	PINGO
DITCH	FOSSÉ
CONTOURS	COURBES DE NIVEAU
APPROXIMATE CONTOURS	COURBES DE NIVEAU APPROXIMATIVES
DEPRESSION CONTOUR	COURBE DE CUVETTE
CLIFF	FALAISE
SPOT ELEVATION APPROXIMATE LAND WATER	POINT COTÉ, APPROXIMATIF SUR TERRE; SUR L'EAU
ESKER	ESKER
SAND SAND DUNES	SABLE, DUNES DE SABLE
HISTORIC SITE	LIEU HISTORIQUE
WOODED AREA FOREST CLEARED AREA (F, C)	SURFACE BOISÉE, FORÊT, ESPACE DÉNUDÉ, CLAIRIÈRE

METRIC/MÉTRIQUE

PHOTOGRAPHY PHOTOGRAPHIE

COMPILATION		RESTITUTION
186 A-24960	7/78	190
A-24960	7/78	
170		166
A-24762	8/77	
37		41
7 A-24762	8/77	3

REVISION REVISION

GRID ZONE DESIGNATION / DÉSIGNATION DE LA ZONE DU QUADRILLAGE	100 000 m SQUARE IDENTIFICATION / IDENTIFICATION DU CARRÉ DE 100 000 m
9V	UA VA 4

EXAMPLE OF METHOD USED TO GIVE A REFERENCE TO NEAREST 100 METRES
EXEMPLE DE LA MÉTHODE EMPLOYÉE POUR FIXER DES REPÈRES À 100 MÈTRES PRÈS

REFERENCE POINT / POINT DE REPÈRE: CHURCH · ÉGLISE (as above) (ci-dessus)

EASTING: Read number on grid line immediately to left of point: / ABSCISSE: Noter le chiffre de la ligne du quadrillage immédiatement à gauche du repère: 97
Estimate tenths of a square from this line eastward to point: / Estimer le nombre de dixièmes du carré entre cette ligne et le repère en direction est: 5 — 975
NORTHING: Read number on grid line immediately below point: / ORDONNÉE: Noter le chiffre de la ligne du quadrillage immédiatement en dessous du repère: 98
Estimate tenths of a square from this line northward to point: / Estimer le nombre de dixièmes du carré entre cette ligne et le repère en direction nord: 4 — 984
GRID REFERENCE / RÉFÉRENCE AU QUADRILLAGE: 975984
Nearest similar grid reference 100 000 metres / La prochaine référence similaire est à 100 000 mètres

ONE THOUSAND METRE UNIVERSAL TRANSVERSE MERCATOR GRID
ZONE 9
QUADRILLAGE DE MILLE MÈTRES TRANSVERSE UNIVERSEL DE MERCATOR

105-O/11	105-O/10	105-O/9
105-O/6	105-O/7	105-O/8
105-O/3	105-O/2	105-O/1

The 1983 MAGNETIC BEARING is 34°43′ (617 mils) EAST of GRID NORTH.
ANNUAL CHANGE DECREASING 8.0′
GRID NORTH is 1°34′ (28 mils) WEST of TRUE NORTH for centre of map.
Le REPÈRE MAGNÉTIQUE en 1983 est à 34°43′ (617 mils) à l'EST du NORD DU QUADRILLAGE.
VARIATION ANNUELLE DÉCROISSANTE 8.0′
NORD DU QUADRILLAGE est à 1°34′ (28 mils) à l'OUEST du NORD GÉOGRAPHIQUE au centre de la carte.

LEGEND - LÉGENDE

ROAD, HARD SURFACE, ALL WEATHER	ROUTE, SURFACE DURCIE, TOUTES SAISONS
ROAD, LOOSE SURFACE	ROUTE, SURFACE DE GRAVIER
CART TRACK, WINTER ROAD	CHEMIN DE CHARROI, ROUTE D'HIVER
TRAIL, CUT LINE, PORTAGE	SENTIER, PERCÉE OU PORTAGE
BUILT-UP AREA	AGGLOMÉRATION
RAILWAY; SIDING, STATION, STOP	CHEMIN DE FER; VOIE D'ÉVITEMENT; STATION; ARRÊT
BRIDGE	PONT
SEAPLANE BASE; SEAPLANE ANCHORAGE	BASE D'HYDRAVIONS; ANCRAGE D'HYDRAVIONS
HOUSE; BARN	MAISON; GRANGE
CHURCH; SCHOOL	ÉGLISE; ÉCOLE
POST OFFICE	BUREAU DE POSTE
TOWER; FIRE; RADIO	TOUR; FEU, RADIO
WELL: OIL, GAS	PUITS: PÉTROLE, GAZ
TANK: OIL, GASOLINE, WATER	RÉSERVOIR: PÉTROLE, ESSENCE, EAU
POWER TRANSMISSION LINE	LIGNE DE TRANSPORT D'ÉNERGIE
MINE	MINE
CUTTING, EMBANKMENT	DÉBLAI; REMBLAI
GRAVEL PIT	CARRIÈRE DE GRAVIER
INTERNATIONAL, PROVINCIAL BOUNDARY WITH MONUMENT	FRONTIÈRE INTERNATIONALE, LIMITE PROVINCIALE AVEC BORNE
COUNTY; DISTRICT BOUNDARY	LIMITE DE COMTÉ OU DE DISTRICT
TOWNSHIP, PARISH BOUNDARY	LIMITE DE CANTON, DE PAROISSE
D.L.S. TOWNSHIP CORNER: SURVEYED, UNSURVEYED	COIN DE CANTON (A.T.C.): ARPENTÉ; NON ARPENTÉ
D.L.S. SECTION CORNERS	COINS DE SECTION (A.T.C.)
MUNICIPALITY BOUNDARY	LIMITE DE MUNICIPALITÉ
RESERVE, PARK, ETC. BOUNDARY	LIMITE DE RÉSERVE, DE PARC, ETC.
HORIZONTAL CONTROL POINT	POINT DE CONTRÔLE PLANIMÉTRIQUE
BENCH MARK WITH ELEVATION (365)	REPÈRE DE NIVELLEMENT AVEC COTE
SPOT ELEVATION, PRECISE: LAND, WATER (397, 221±)	POINT COTÉ, PRÉCIS: SUR TERRE; SUR L'EAU
STREAM OR SHORELINE: INDEFINITE	COURS D'EAU OU RIVE: IMPRÉCIS
DIRECTION OF FLOW	DIRECTION DU COURANT
LAKE; INTERMITTENT LAKE; PONDS	LAC; LAC INTERMITTENT; ÉTANGS
FLOODED LAND	TERRAIN INONDÉ
MARSH, SWAMP (WOODED)	MARAIS; BOISÉ MARÉCAGEUX
DRY RIVER BED WITH CHANNELS	LIT DE RIVIÈRE ASSÉCHÉ AVEC CHENAUX
STRING BOG	FONDRIÈRE À FILAMENTS
TUNDRA LAKES IN TUNDRA, POLYGONS (LT, PG)	TOUNDRA: LACS EN TOUNDRA; POLYGONES DE TOUNDRA
RAPIDS; FALLS; RAPIDS	RAPIDES; CHUTES; RAPIDES
FORESHORE FLATS, SAND IN WATER	ESTRANS, SABLE SOUS L'EAU
ROCKS	ROCHES
DAM	BARRAGE
WHARF	QUAI
DITCH	FOSSÉ
CONTOURS	COURBES DE NIVEAU
APPROXIMATE CONTOURS	COURBES DE NIVEAU APPROXIMATIVES
DEPRESSION CONTOUR	COURBE DE CUVETTE
CLIFF	FALAISE
SPOT ELEVATION, APPROXIMATE: LAND; WATER (965, 590±)	POINT COTÉ, APPROXIMATIF: SUR TERRE; SUR L'EAU
ESKER	ESKER
SAND, SAND DUNES	SABLE, DUNES DE SABLE
PALSA BOG (PA)	FONDRIÈRE DE PALSE
WOODED AREA, FOREST (F)	SURFACE BOISÉE, FORÊT
CLEARED AREA (C)	ESPACE DÉNUDÉ, CLAIRIÈRE

METRIC/MÉTRIQUE

PHOTOGRAPHY PHOTOGRAPHIE

COMPILATION		RESTITUTION
7 A-24762	8/77	3
A-24763	8/77	
179		182
A-24516	7/76	
74		72
26 A-24516	7/76	29

REVISION REVISION

GRID ZONE DESIGNATION / DÉSIGNATION DE LA ZONE DU QUADRILLAGE	100 000 m SQUARE IDENTIFICATION / IDENTIFICATION DU CARRÉ DE 100 000 m
9V	UA VA / UV VV 70 4

EXAMPLE OF METHOD USED TO GIVE A REFERENCE TO NEAREST 100 METRES
EXEMPLE DE LA MÉTHODE EMPLOYÉE POUR FIXER DES REPÈRES À 100 MÈTRES PRÈS

REFERENCE POINT / POINT DE REPÈRE: CHURCH · ÉGLISE (as above) (ci-dessus)

EASTING: Read number on grid line immediately to left of point: / ABSCISSE: Noter le chiffre de la ligne du quadrillage immédiatement à gauche du repère: 97
Estimate tenths of a square from this line eastward to point: / Estimer le nombre de dixièmes du carré entre cette ligne et le repère en direction est: 5 — 975
NORTHING: Read number on grid line immediately below point: / ORDONNÉE: Noter le chiffre de la ligne du quadrillage immédiatement en-dessous du repère: 98
Estimate tenths of a square from this line northward to point: / Estimer le nombre de dixièmes du carré entre cette ligne et le repère en direction nord: 4 — 984
GRID REFERENCE / RÉFÉRENCE AU QUADRILLAGE: 975984
Nearest similar grid reference 100 000 metres (about 63 miles) / La prochaine référence similaire est à 100 000 mètres (environ 63 milles)

ONE THOUSAND METRE UNIVERSAL TRANSVERSE MERCATOR GRID
ZONE 9
QUADRILLAGE DE MILLE MÈTRES TRANSVERSE UNIVERSEL DE MERCATOR

105-O/6	105-O/7	105-O/8
105-O/3	105-O/2	105-O/1
105 J/14	105 J/15	105 J/16

The 1983 MAGNETIC BEARING is 34°28′ (613 mils) EAST of GRID NORTH.
ANNUAL CHANGE DECREASING 8.0′
GRID NORTH is 1°34′ (28 mils) WEST of TRUE NORTH for centre of map.
Le REPÈRE MAGNÉTIQUE en 1983 est à 34°28′ (613 mils) à l'EST du NORD DU QUADRILLAGE.
VARIATION ANNUELLE DÉCROISSANTE 8.0′
NORD DU QUADRILLAGE est à 1°34′ (28 mils) à l'OUEST du NORD GÉOGRAPHIQUE au centre de la carte.

CONVERSION SCALE FOR ELEVATIONS / ÉCHELLE DE CONVERSION DES ALTITUDES
Metres 30 20 10 0 50 100 150 200 250 300 Mètres
Feet 100 50 0 100 200 300 400 500 600 700 800 900 1000 Pieds

PRODUCED BY THE SURVEYS AND MAPPING BRANCH, DEPARTMENT OF ENERGY, MINES AND RESOURCES, OTTAWA. PUBLISHED IN 1982.

COPIES MAY BE OBTAINED FROM THE CANADA MAP OFFICE, DEPARTMENT OF ENERGY, MINES AND RESOURCES, OTTAWA, OR YOUR NEAREST MAP DEALER.

ELEVATIONS IN METRES ABOVE MEAN SEA LEVEL
CONTOUR INTERVAL .... 20 METRES
NORTH AMERICAN DATUM 1927
TRANSVERSE MERCATOR PROJECTION

INFORMATION CONCERNING LOCATION AND PRECISE ELEVATION OF BENCH MARKS CAN BE OBTAINED BY WRITING TO THE GEODETIC SURVEY, SURVEYS AND MAPPING BRANCH, OTTAWA.

YUKON TERRITORY
Scale 1:50 000 Échelle
Miles 1 0 1 2 3 Milles
Metres 1000 0 1000 2000 3000 4000 Mètres
Yards 1000 0 1000 2000 3000 4000 Verges

ALTITUDES EN MÈTRES
ÉQUIDISTANCE DES COURBES ..... 20 MÈTRES
SYSTÈME DE RÉFÉRENCE GÉODÉSIQUE NORD-AMÉRICAIN 1927
PROJECTION TRANSVERSE DE MERCATOR

ON PEUT OBTENIR DES RENSEIGNEMENTS SUR LE LIEU ET L'ALTITUDE EXACTE DES REPÈRES DE NIVELLEMENT EN ÉCRIVANT AUX LEVÉS GÉODÉSIQUES, DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, OTTAWA.

ÉTABLIE PAR LA DIRECTION DES LEVÉS ET DE LA CARTOGRAPHIE, MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES, OTTAWA. PUBLIÉE EN 1982.

CES CARTES SONT EN VENTE AU BUREAU DES CARTES DU CANADA, MINISTÈRE DE L'ÉNERGIE, DES MINES ET DES RESSOURCES, OTTAWA, OU CHEZ LE VENDEUR LE PLUS PRÈS.

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