GEOLOGICAL REPORT - 1981

FLUKE CLAIM GROUP

Omineca Mining Division
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By

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FLUKE CLAIM GROUP

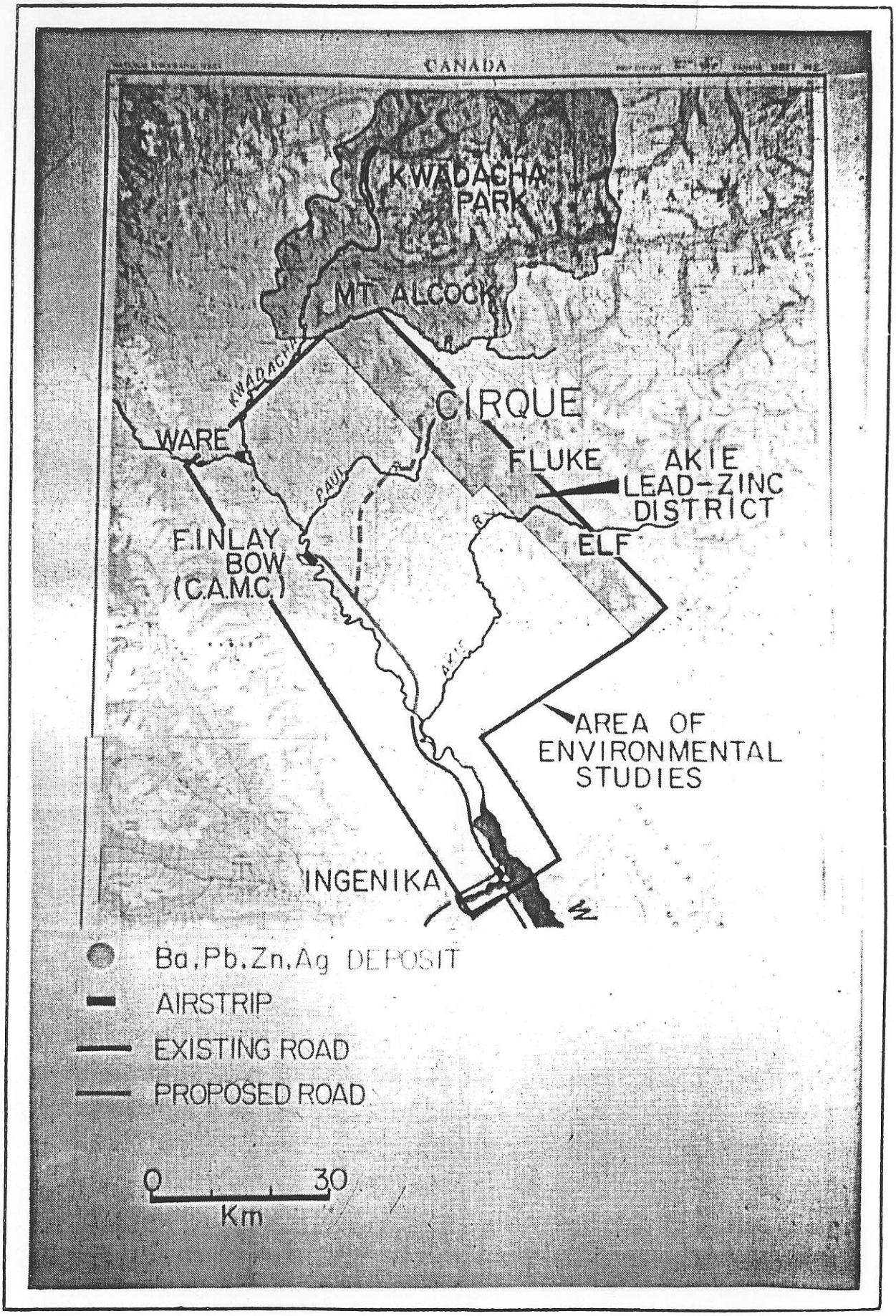
INTRODUCTION

The FLUKE claims were staked in 1978 to cover a laminated pyrite showing with minor Pb-Zn mineralization at the head of Fluke Creek (Fig. 1). The claims also encompass a baritic Pb-Zn showing at the head of Pook Creek and Ba-Pb-Zn geochemical silt and soil anomalies in nearby stream drainages. The showings and anomalies occur within carbonaceous, siliceous shales of the Late Devonian Gunsteel Formation which is host for stratiform Ba-Fe-Pb-Zn-Ag mineralization along strike to the northwest (CIRQUE claims) and southeast (ELF claims).

During the 1978 and 1979 field seasons geologic mapping, grid soil sampling, and prospecting were completed to outline exploration targets for diamond drilling. The Fluke Creek showing was tested in 1980 with four diamond drill holes for a total depth drilled of 1,787 meters. Drilling was not successful in outlining economic mineralization at depth.

Geologic mapping of the central portion of the FLUKE claims at a scale of 1:2000 was completed during June - September, 1981. Two NQ diamond drill holes were also completed to test geochemical soil anomalies within the Gunsteel Formation. Total depth drilled during 1981 was 915 meters. The 1981 holes were geologically logged in detail and portions of the 1980 holes were relogged to be consistent with the revised stratigraphy for the FLUKE claims. The Pook Creek Ba-Pb-Zn showing was discovered in the course of continued geologic mapping after drilling was completed and the drill moved off the property.

This report summarizes the geology of the FLUKE claims. It incorporates information from surface mapping, the four 1980 drill holes, and the two 1981 drill holes. The revised geology and geochemistry are then used to outline potential target areas on the claim group.


CANADA
KWADACHA PARK
MT ALCOCK
KWADACHA R.
CIRQUE
WARE
FLUKE
AKIE LEAD-ZINC DISTRICT
PAUL R.
ELF
FINLAY BOW (C.A.M.C.)
AKIE R.
AREA OF ENVIRONMENTAL STUDIES
INGENIKA
Ba, Pb, Zn, Ag DEPOSIT
AIRSTRIP
EXISTING ROAD
PROPOSED ROAD
0
30
Km

STRATIGRAPHIC OVERVIEW

Strata in the vicinity of the FLUKE claims range in age from Cambrian through Mississippian. Cambrian to Silurian sedimentary rocks define a northwest-trending shale basin (Kechika Trough) with subtle to distinct northeast-southwest facies changes (Cecile and Norford, 1979). These facies changes delineate a transition from carbonate platform sedimentation (northeast) to shale basin sedimentation (southwest). This transition occurs about 15 km. east of the FLUKE. Therefore, the Lower Paleozoic strata near the FLUKE indicate a dominantly shale marine basin with a generally uniform depositional environment.

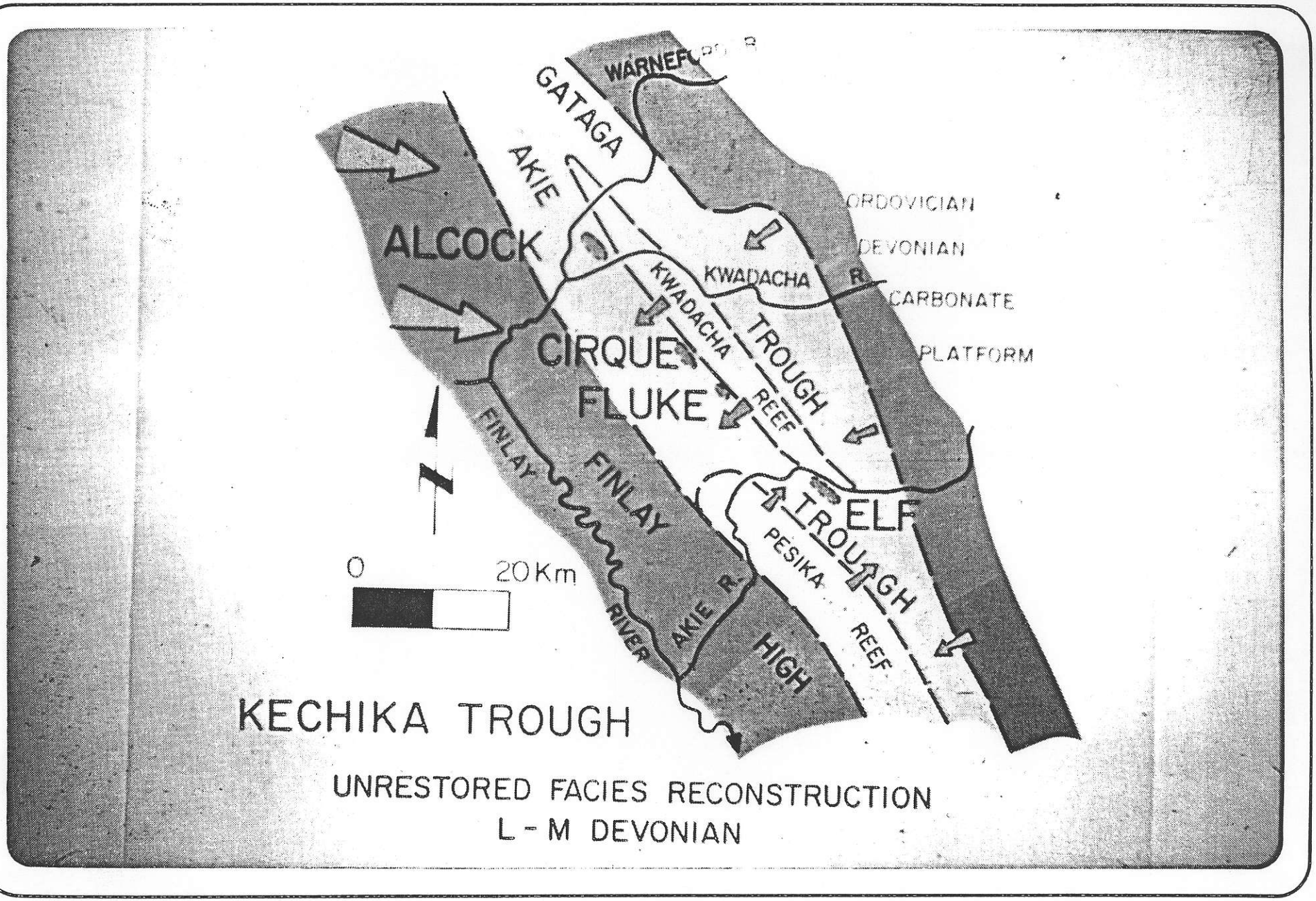
In contrast, rapid facies changes in the Devonian to Mississippian strata outline shale deposition in three smaller, northwest-trending, linear troughs (Fig. 2). Facies changes are most pronounced normal to the northwest trend of the depositional troughs.

Stratiform Ba-Fe-Pb-Zn-Ag mineralization is restricted to the earliest Late Devonian strata in the central Akie Trough. Figures 3 and 4 illustrate facies relationships for the Akie Trough in the vicinity of the FLUKE claims. The detailed stratigraphy mapped on the claims is presented in Table 1 and Figure 5 and described in the following section.

DETAILED STRATIGRAPHY

KECHIKA GROUP

The lowermost unit exposed on the FLUKE claims is the Cambrian-Ordovician Kechika Group. It outcrops on the extreme western margin of the claim group. It consists of silvery grey, argillaceous limestone with abundant calcareous nodules. The top of the Kechika Group locally contains minor chloritic metabasaltic rocks.



UNRESTORED FACIES RECONSTRUCTION
L - M DEVONIAN

ROAD RIVER GROUP

The Ordovician-Silurian Road River Group conformably overlies the Kechika Group. On the FLUKE claims it consists dominantly of variably calcareous, carbonaceous, graptolitic shales with limestone and siltstone interbeds. The top of the Road River Group has been mapped as the top of the Silurian Siltstone. All formations of the group have a widespread, generally uniform distribution. The different formations contained within the Road River Group are described below.

Ordovician Silty Shale (ORS)

The lowermost part of the Road River Group consists dominantly of massive to finely laminated, dark brown to black, variably calcareous, silty shale. Both upper and lower contacts appear to be conformable. The Ordovician Limestone (ORL) and Ospika Volcanics (OV) are both contained within this formation. The shale typically weathers to a variety of pastel shades of pink, grey or tan.

Ordovician Limestone (ORL)

The Ordovician Limestone consists of rhythmically bedded, grey limestone with thin black shale interbeds. Cross bedding, fine planar laminae, and graded bedding are common primary structures. The limestone beds range from 0.1 - 20 cm. in thickness.

On the FLUKE claims the limestone consists of two units separated by an interval of silty shale. Each of the limestone units is about 10 meters thick. The lower unit weathers pale grey, and the upper unit weathers tan. East of the FLUKE claims the limestone is a single unit which is greater than 30 meters thick.

Ospika Volcanics (OV)

The Ospika Volcanics consist of calcareous pillow basalts, tuffs, breccias, and minor gabbro intrusions. Typically, the tuffs and breccias weather to a distinctive bright orange. Major outcrops of this unit occur east and west of the FLUKE claims.

Ospika volcanic rocks are present on the southwest part of the claims. There they consist of fine grained, orange weathering

tuffs containing pale green chloritic clasts. The tuffs occur stratigraphically just below the upper contact of the Ordovician silty shale (ORS). Just north of the Fluke Ridge, the tuffs thin rapidly and disappear.

On the North Fluke Ridge the Ospika Volcanics are represented by an irregular, equigranular gabbro intrusion. This intrusion occurs at a slightly higher stratigraphic level within the Road River Group than the tuffs to the south.

Ordovician Graptolitic Shale (ORG)

A variably calcareous, massive to finely laminated, graptolitic black shale (ORG) conformably overlies the Ordovician Silty Shale (ORS). This shale typically weathers to a dull, light grey. It is distinguished from the underlying silty shale by its black colour, light grey weathering, nonsilty texture, and locally abundant graptolites.

Silurian Limestone (SRL)

Overlying the ORG shale is a rhythmically bedded, flaggy, grey limestone with thin black shale partings. Primary graded bedding and cross laminae are common. Irregular black chert nodules occur throughout the limestone. The lower contact appears to be conformable but corresponds to the Early Silurian unconformity noted by Jackson et al (1965) and Cecile and Norford (1979). The upper contact is gradational and interbedded with the overlying Silurian Chert and Silurian Siltstone.

Silurian Chert (SRC)

The Silurian Chert is a thin transition zone between the underlying Silurian Limestone (SRL) and the overlying Silurian Siltstone (SSS). On the FLUKE claims it was observed only on Fluke Ridge. It consists of silty black shale with thin black chert lenticles. The chert lenticles weather black, and the shale weathers to a dull light grey.

Silurian Siltstone (SSS)

The Silurian Siltstone is a medium grey, tan-weathering, bioturbated, dolomitic siltstone. Typically, it forms dominant-weathering, thick bedded outcrops. S1 and S2 axial plane cleavages occur as wispy pressure solution striping that can easily be mistaken for bioturbated So bedding surfaces.

Some units within the Silurian Siltstone are finely laminated and argillaceous. The finely laminated facies typically weathers recessively to thin platy scree.

The lower part of the Siltstone contains a light grey rhythmically laminated limestone unit about 2 meters thick. It is similar in appearance to the SRL and ORL units in the Road River Group but is distinguished by its fine laminae (instead of rhythmic bedding) and its lack of cross laminae.

The Silurian Siltstone is unconformably overlain by Devonian strata. In the vicinity of the FLUKE claims, the Silurian Siltstone has been mapped as the uppermost unit within the Road River Group. Overlying units contain rapid facies changes and indicate more localized depositional environments in the Devonian-Mississippian Akie Trough.

KWADACHA REEF (DKR)

Thick bedded, fossiliferous, grey limestone unconformably overlies the Silurian Siltstone (SSS). Fossils indicate that the limestone is Early to Middle Devonian in age (Gabrielse 1981). This unit occurs only on the northeast side of the Akie Trough.

The limestone outcrops at low elevations in Fluke Creek and South Fluke Bowl. In both cases it is the lowest Devonian strata observed in the immediate area. It was also intersected in the bottom of DDH 81-F-02.

PAUL RIVER FORMATION (DP)

The Paul River Formation conformably overlies and flanks the southwest side of the Kwadacha Reef (DKR) on the FLUKE claims. This unit was intersected by DDH 81-F-01 and 81-F-02; it has not been observed at surface.

It consists of slightly pyritic, carbonaceous, intraformational shale chip breccia. The breccia is characterized by minor amounts of coarse, angular clasts of fossiliferous limestone (DKR) and pyritic, siliceous siltstone (DCS?). Bedding is not clear within the breccia. The breccia is considered to represent a series of debris flows on the western flank of the Kwadacha Reef. The partial lateral equivalence with the Kwadacha Reef suggests an Early to Middle Devonian age.

In DDH 81-F-01 the shale chip breccia contains thin interbeds of Conundrum Siltstone (DCS). In DDH 81-F-02 the breccia is interbedded with moderately siliceous, black shales of the Gunsteel Formation (DGPR).

EARN GROUP

The Devonian to Mississippian Earn Group contains the stratiform Ba-Fe-Pb-Zn-Ag mineralization on the FLUKE claims. Several formations have been mapped as partial lateral and vertical facies equivalents. Stratigraphic relations among the different facies have been interpreted from both surface mapping and drill core. In the absence of paleontological control the bottom of the Earn Group appears to be laterally equivalent to the Paul River Formation and Kwadacha Reef. Other facies overlie and are younger than these two formations.

The different facies of the Earn Group will be described in approximate ascending stratigraphic sequence, although lateral facies variations complicate the sequential pattern. Basically, the Earn Group has been divided into coarse clastic rocks (Warneford Formation) and fine clastic rocks (Akie and Gunsteel Formations). The Gunsteel Formation is differentiated from the Akie Formation because it is siliceous. The two showings on the FLUKE claims occur within the Gunsteel Formation.

Generally, the Warneford Formation overlies the Akie and Gunsteel Formations although in detail it is also interbedded with these units.

Gunsteel Formation (DG)

The Gunsteel Formation contains all siliceous, fine clastic rocks within the Earn Group. Two major facies have been recognized and mapped on the FLUKE claims. The Gunsteel shales are harder and have a much smoother S_1 slaty cleavage surface than the shales of the Akie Formation. Stratigraphically the Gunsteel Formation occurs in the lower part of the Earn Group.

The lowermost member of the Gunsteel Formation on the FLUKE claims is a massive to thin bedded, noncalcareous, black, siliceous shale. The unit is colloquially known as the "Pregnant shale" (DGPR). Locally it contains nodules and/or concretions of pyrite, calcite, chert or barite. Thin, medium-grey, slightly calcareous siltstone laminae occur in minor amounts. DGPR contains several 1-3 meter thick, massive to ribbon-bedded, black porcellanite horizons (DGCM) which occur mainly near the top and bottom contacts. DGPR as mapped on the FLUKE claims corresponds to DGPR + DGTH + DGTF as mapped on the CIRQUE claims.

The S_1 slaty cleavage is well developed in DGPR as a smooth, planar surface. DGPR typically weathers to scree slopes consisting of small, flat S_1 cleavage flakes that may expose S_0 laminations. Weathered surfaces are commonly pale bluish-grey although pyritic portions of the shale weather to a dark rusty brown.

On the CIRQUE and ELF claims DGPR contains the stratiform Ba-Fe-Pb-Zn-Ag mineralization. Two sulphide showings within the Pregnant shale on the FLUKE claims have been partially delineated by surface mapping. The Fluke Creek showing is located on the upper part of Fluke Creek and consists of a 1 meter thick interval of laminated pyrite within black shale. A chip sample across the 1 meter interval and a grab sample with visible galena and sphalerite were assayed with the following results (Roberts 1979).

Sample	Type	Pb(%)	Zn(%)	Ag.gm/tonne	Ba(%)
GF8R 222R	Chip	1.36	2.45	7.0	0.52
R 254R	Grab	6.58	8.42	11.2	0.62

This showing was drill tested down-dip to the southwest during the 1980 field season with negative results (Roberts 1981).

During the latter part of the 1981 field season the Pook showing was discovered by Pigage and Jefferson on the cliff just west of Pook Creek. This showing consists of 2.5 meters of interbedded shale and laminated barite containing disseminated galena. It was traced laterally over a distance of some 15 meters from a quartz-calcite vein at the north end to scree cover at the south end. This showing has not yet been drill tested for lateral and down-dip extent. Two chip sample intervals from the showing yielded the following assay results.

Sample	Type	Interval	Pb(%)	Zn(%)	Ag.gm/tonne	Ba(%)
10352	Chip	Top 1.2 m.	6.72	0.04	70.5	24.5
10353	Chip	Bottom 1.3 m.	3.82	0.36	39.5	45.3

All drilling to date on the FLUKE claims was designed to test the economic potential of the Pregnant shale. All holes have intersected the Pregnant shale in one or more structural panels. In all cases the "active horizon" within the Pregnant shale consists of a thin zone of laminated, fine-grained pyrite with no visible galena or sphalerite. The following discussion of facies relations is based on both surface mapping and drill core information.

In DDH 81-F-01 and 81-F-02 DGPR conformably overlies and is interlayered with shale chip breccia of the Paul River Formation (DP). These interfingering relations indicate that the basal part of the Pregnant shale is the southwestern lateral equivalent of the Paul River Formation. DGPR is in turn conformably overlain by DGCH or DMWB. Facies inferences from these upper contact relations are discussed later.

Immediately west of Pook Creek a thick sequence of intercalated black porcellanite and siliceous shale (DGCH) conformably overlies the Pregnant shale. Both rock types are ribbon-bedded with individual beds being 2 - 5 cm. thick. S_0 primary bedding surfaces weather to a light silvery grey. The S_1 cleavage is typically present as a poorly developed, spaced, fracture. One vaguely defined horizon within DGCH contains scattered large limestone concretions (up to 2 meters in diameter).

DGCH was intersected in DDH 80-F-01 and 81-F-01. In both drill holes it contained a thin interval of laminated and nodular (blebby) barite with minor pyrite. This barren barite horizon has not yet been observed in outcrop on the FLUKE.

The geology map (1:10,000) indicates that DGCH has a limited areal extent which is not totally structurally controlled. This suggests that DGCH thins or disappears to the southwest and northwest through lateral facies changes. In the headwaters of Fluke Creek and in South Fluke Bowl the Warneford Formation (DMWB) conformably overlies the Pregnant shale. Therefore, DMWB is in part the southwest lateral equivalent of DGCH. This facies relationship is confirmed in DDH 80-F-01 which intersected an intercalated sequence of DGCH and DMWB shale chip breccia overlying the Pregnant shale.

Surface mapping indicates that DGCH does not extend along strike to the knob northwest of Fluke Creek. Further, DGCH was not intersected in DDH 81-F-02. In Fluke Creek DGCH contains thin intercalated DGPR intervals. These relations, together with the uniform thickness of the overlying DMWB unit, suggest that DGPR is the northwest lateral equivalent of DGCH.

The cliff immediately west of Silver Creek contains a thick ribbon chert sequence with large limestone concretions which is lithologically identical to DGCH. This ribbon chert package has been tentatively correlated with DGCH. It is overlain by phyllitic shale (DAP) and underlain by DMWB. The lower and upper contacts are not exposed; it is uncertain whether they are stratigraphic or structural.

Akie Formation (DA)

All nonsiliceous shales in the Earn Group have been included within the Akie Formation. Different facies are distinguished on the basis of colour and weathering characteristics. Generally the pervasive S1 slaty cleavage is irregularly developed as a rough planar surface. So primary bedding is only locally readily visible. The Akie Formation can be distinguished from the Gunsteel Formation by its rough S1 cleavage surface and softness.

On the regional scale different members of the Akie Formation occur at all stratigraphic levels of the Earn Group. On the FLUKE claims most of the Akie shales are interbedded with the Warneford Formation (DMW) in the uppermost part of the Earn Group.

Dark brown to black silty shale (DASL) immediately overlies the Kwadacha Reef on the Fluke and Bumslide Creeks. DASL is best exposed on Fluke Creek. Generally, it is massive bedded with a poorly developed, spaced S1 fracture cleavage. Locally the silty shale contains thin, tan-weathering siltstone laminae. This unit has not been recognized in drill core; it apparently does not occur on the southwest margins of the Kwadacha Reef and Paul River Formation.

Light to medium grey, faintly laminated, soft shale (DAP) comprises one of the major members of the Akie Formation. This shale is characterized largely by its grey colour and extreme softness (It can be scratched with the fingernail). The pervasive S1 slaty cleavage is irregularly developed as slightly curved surfaces with a greasy sheen. Colloquially this unit has been termed the "phyllitic shale" because of this micaceous sheen on fresh S1 cleavage surfaces. Commonly it weathers to pale rusty-brown, lenticular flakes.

On the FLUKE claims the phyllitic shale is typically interbedded with the Warneford Formation (DMWB) in the uppermost part of the Earn Group. It is also interlaminated on a fine scale with a less soft member of the Akie Formation (DARS), again stratigraphically in the upper part of the Earn Group. Surface exposures on the

FLUKE indicate that stratigraphically it overlies or is laterally equivalent to the more siliceous Gunsteel Formation (DGPR). The phyllitic shale has been intersected in minor amounts in DDH 80-F-01, where it was interlayered with the Warneford Formation (DMWB). In contrast, on the CIRQUE claims the phyllitic shale conformably underlies and overlies the siliceous Gunsteel Formation (DGPR) containing the stratiform mineralization.

Dark brown, rusty-weathering, indistinctly bedded shale (DARS) is the other major member of the Akie Formation on the FLUKE claims. This shale is characterized by thin pyritic siltstone laminae which weather to a distinctive bright orange colour. The S1 slaty cleavage is developed as a rough surface.

DARS is commonly intercalated with the phyllitic shale (DAP) on a scale of cm. It is also interbedded with different facies of the Warneford Formation. It has been intersected in minor amounts interlayered with the Warneford Formation in the different drill holes.

In South Fluke Bowl, DARS is stratigraphically the uppermost unit exposed in a large S1 syncline. It conformably overlies the ribbon chert member of the Gunsteel Formation (DGCH). The basal part of DARS in this syncline contains numerous thick-bedded, dark brown, siltstone to sandstone units. The bottom of the unit also contains a thin baritic zone with abundant blebby barite nodules in a rusty-weathering, pyritic shale matrix. Local siltstone horizons within DARS are distinctly bedded and weather to a grey and white pinstriped appearance (DAPS). These pinstriped shales are generally less than 10 meters thick in this area.

Warneford Formation (DMW)

On Fluke Creek and in South Fluke Bowl DGPR is conformably overlain by moderately hard to soft, dark grey to black, intraformational shale chip breccia (DMWB). These breccias weather to lenticular chips with a rough, bluish-grey surface. So primary bedding is not readily visible. The unit is also characterized by thin wispy

lenses and discontinuous laminae of siltstone to sandstone. The siltstone layers are partially to completely disrupted by the S1 slaty cleavage. Large discontinuous lenses to beds of sandstone (DMWQ) and chert pebble conglomerate (DMWC) are present locally throughout the unit.

DMWB is intersected in DDH 80-F-01, 80-F-02, 80-F-03, 80-F-04 and 81-F-02. As discussed previously, it is in part the southwest lateral equivalent of DGCH. DMWB is intercalated with phyllitic shale (DAP), thin ribbon chert intervals (DMWT) and dark brown, rusty shale (DARS). In general this unit overlies the Gunsteel Formation. In South Fluke Bowl, however, DMWB appears to conformably underlie DGCH.

Conundrum Siltstone (DCS)

In Fluke Creek and South Fluke Bowl the Conundrum Siltstone (DCS) overlies the Kwadacha Reef (DKR) or the Akie silty shale (DASL). The best exposures occur on South Fluke Ridge. DCS is typically an indistinctly bedded, soft, variably calcareous, speckled siltstone. Locally it coarsens to a sandstone or conglomerate. Shale clasts are ubiquitous in minor amounts.

Exposures of the Conundrum Siltstone are restricted to a northwest-trending linear belt on the eastern margin of the FLUKE claims. Thickness along strike within this belt varies rapidly and extensively. DCS thins from an exposed thickness of greater than 300 meters on South Fluke Ridge to less than 100 meters on Fluke Creek. It is again a major unit on North Fluke Ridge. In South Fluke Bowl, DCS is intercalated with DGPR. In DDH 81-F-01, DCS is interbedded with shale chip breccia of the Paul River Formation (DP).

These different relations suggest that deposition of DCS was confined to a longitudinal northwest-trending trough or channel centred over the western margin of the Kwadacha Reef (DKR). Laterally equivalent strata to the southwest include the Paul River Formation (DP) and, in part, the Pregnant shale (DGPR). Deposition of the siltstone appears to have encompassed a long time span.

STRATIGRAPHY SUMMARY

Devonian and Mississippian strata of the Earn Group are preserved in a series of northwest-trending synformal fold keels and thrust plates. The Earn Group was deposited in three linear northwest-trending topographic troughs. Stratiform Ba-Fe-Pb-Zn-Ag mineralization is restricted to the earliest Late Devonian strata in the Akie Trough.

Figures 3 and 4 illustrate the stratigraphic and facies relationships for the Akie Trough in the vicinity of the Fluke claims. From these figures it is obvious that the carbonate reefs and Earn Group strata rest unconformably on a relatively uniform Cambrian to Silurian basinal sequence of turbiditic shales, siltstones and limestones.

In contrast clastic rocks of the Devonian-Mississippian Earn Group contain three dimensional facies changes which are most pronounced normal to the northwest strike of the Akie Trough. These facies changes suggest varying depositional environments within the Akie Trough.

The northeast margin of the trough is flanked by Early to Middle Devonian limestones of the Kwadacha Reef. The Reef is flanked to the southwest by intraformational shale chip breccia containing coarse carbonate detritus derived from the reef (Paul River Formation - DP). Further southwest, in the more distal part of the basin, the Devonian package consists of carbonaceous shales of the Akie (DA) and Gunsteel (DG) Formations. The Akie Formation is soft and aluminous; the Gunsteel Formation is siliceous and contains several ribbon-bedded chert horizons as well as stratiform Ba-Fe-Pb-Zn-Ag mineralization.

Overlying and interbedded with the Gunsteel/Akie carbonaceous shales are shale chip breccia and chert pebble conglomerate of the Warnefold Formation (DMW). Chert clasts within the conglomerates may have been eroded from cherts in the Ordovician to Silurian Road River Group.

The Conundrum Siltstone (DCS) directly overlies the thickest part of the Kwadacha Reef on the FLUKE claims. It appears to be deposited in a northwest-trending channel which was present for much of the interval represented by the Gunsteel Formation.

STRUCTURAL OVERVIEW

The FLUKE claims are located within the Rocky Mountain Fold and Thrust Belt of northeastern British Columbia. The dominant structural style consists of tight, asymmetric, northeast-verging folds bounded by northeast-directed high angle reverse faults. Faults and folds are clearly related as the faults typically have broken through the overturned S-limb of the asymmetric folds. Deformation is considered to have occurred during the Laramide Orogeny.

All units within the FLUKE claims have been affected by two phases of folding deformation. The earliest D1 deformation is regionally developed; D1 macroscopic folds form the major structural features. High angle reverse faults are also associated with the D1 deformation. In contrast D2 deformation is only locally developed. D2 structures are important on a property scale when correlating units between drill holes. Both D1 and D2 folds are cut by late, steeply dipping normal faults. Strike orientation of these faults is highly variable.

DETAILED STRUCTURE

D1 Deformation

Macroscopic D1 deformation structures are shown on the geologic maps and associated vertical cross sections. In some instances D1 fold axial traces are not tightly constrained because of lack of outcrop and difficulties observing So primary bedding.

The D1 deformation is characterized by tight northwest-trending, asymmetric folds with northeast vergence. A pervasive S1 axial plane cleavage is regionally developed. In shales S1 forms a slaty cleavage and in siltstones, limestones and porcellanites it consistently forms a closely spaced fracture cleavage. In many instances the S1 cleavage also contains a well developed pressure solution striping which corresponds to differences in carbon content.

D1 folds typically have a gentle southwest-dipping, upright Z-limb and a steep southwest-dipping, overturned S-limb. The S1 cleavage

also dips steeply to the southwest. Lithologic units in the S-limb typically have been slightly thinned by the D1 folding. Axial traces of D1 macroscopic folds commonly define an en echelon pattern.

Southwest-dipping, northeast-directed, high angle reverse faults are associated with the D1 macroscopic folds. Reverse faults typically have broken through the overturned S-limbs of D1 folds. In many instances displacement along the reverse faults is not extensive. Strike of the reverse faults is parallel to that of the D1 macroscopic folds.

On the FLUKE claims reverse faults divide the area into five major structural panels. The structurally uppermost panel A is located on the western margin of the 1981 map area. Panel A consists of Cambrian through Silurian strata. Structural panels B-E expose Devonian-Mississippian strata of the Earn Group.

Cambrian-Silurian strata within panel A form the overturned, steeply-dipping S-limb of a large D1 anticline. The axial trace of this anticline is located west of the 1981 map area. The anticlinal axial trace and associated small reverse fault on the extreme west margin of the 1981 mapping appears to represent a broken parasitic fold within the large-scale S-limb sequence.

Reconnaissance mapping indicates that the gently-dipping Z-limb of panel A contains the stratiform Ba-Fe-Pb-Zn-Ag mineralization on the CIRQUE claims. Panel A on the FLUKE would form the Lower Paleozoic footwall for mineralization on the CIRQUE.

Panel B contains the mineralized showings on the FLUKE claims. The major soil and silt geochemical anomalies also appear to be confined to this structural panel. All drilling on the FLUKE has been restricted to this panel. Surface exposures and drill intersections within this panel consist of Lower Devonian to Mississippian shales and limestones. Both surface mapping and drilling have outlined several D1 macroscopic folds.

In South Fluke Bowl, panel B consists of a large D1 syncline. The oldest unit exposed in the syncline is DGPR, and the youngest unit coring the syncline is DARS. No major structural discontinuities were observed within panel B in this area.

In contrast, both surface mapping and drill hole information for panel B in the Fluke Creek area have outlined a high angle reverse fault which structurally places DGPR over DMWB (see cross section). DGPR and DMWB structurally above this reverse fault define a D1 syncline with DMWB being in the core of the syncline. Strata structurally below the reverse fault form an upright, gentle to moderate southwest-dipping D1 Z-limb. The reverse fault and overlying D1 syncline are contained entirely within panel B.

Neither the reverse fault nor the D1 syncline in the Fluke Creek area can be traced along strike southeast into South Fluke Bowl. Further, the surface trace of the reverse fault appears to be directly on strike with the axial trace of the major D1 syncline mapped in South Fluke Bowl. Therefore, the reverse fault is considered to be the northwest extension of the D1 syncline mapped in South Fluke Bowl. To the northwest the S-limb of the syncline has been removed by increasing displacement along the reverse fault. The D1 syncline in the Fluke Creek area is considered to be an en echelon parasitic fold which increases in size along strike to the northwest.

Panels C, D and E are located on the east margin of the Fluke claims. Units exposed at the surface are dominantly Akie and Warneford Formations from the upper part of the Earn Group, although the Kwadacha Reef is locally exposed in Fluke and Bumslide Creeks.

The reverse faults bounding panels D and E are speculative. Traverses on the east side of the FLUKE claims have delineated some lithologic repetition within dominantly upright Z-limb symmetry. This repetition may represent either interfingering of conformable units or structural repetition. I have interpreted it as structural repetition because of the greatly increased apparent thickness of the Earn Group above the Kwadacha Reef in the Silver Creek area.

De Deformation

D2 deformation is only locally developed. D2 mesoscopic folds characteristically occur as northwest-trending, open to tight, upright folds with northeast vergence. Fold trends are roughly coaxial with D1 deformation trends. Hinge zones of D2 folds contain a weakly to strongly developed S2 axial planar crenulation cleavage. Locally the S2 cleavage is so intensely developed that it becomes the dominant cleavage present.

D2 mesoscopic folds are best developed in the headwaters of Fluke Creek. Maximum fold amplitude in this area is 30 meters. D2 surface axial traces outline several en echelon folds. In some instances D2 hinge zones also contain significant offset along normal faults associated with the D2 deformation. One fault in the Fluke Creek area appears to have at least 30 meter displacement with the northeast side being downthrown.

Drilling during the 1980 field season was done in the area of intensely developed mesoscopic D2 folding. Therefore, DDH 80-F-01, 80-F-02 and 80-F-04 were relogged in detail during the 1981 field season to determine the extent of S2 cleavage development and to detect possible D2 folds. In all the relogged drill holes the S2 crenulation cleavage was locally developed, and in some instances it became the dominant cleavage present in drill core. Where both S1 and S2 cleavages were present, the S2 cleavage was typically outlined by small chattermarks on the sides of the drill core. (In all of the relogging S1 was still considered to be the reference fabric element). In spite of the locally intense S2 cleavage in drill core, no major D2 hinge zones were observed. Since these drill holes pass beneath the maximum surface development of D2 folding, D2 folds are considered to be disharmonic.

D3 Deformation - Normal Faults

The latest deformation feature recognized on the FLUKE claims are steeply-dipping to vertical normal faults which offset all other

structures. Strike orientation of these faults is highly variable. Displacement is generally less than 50 meters with the west side being down. Commonly the fault zones contain extensive gouge and/or quartz-calcite veining.

STRUCTURAL SUMMARY

The FLUKE claims contain several structural panels bounded by high angle reverse faults. Strata within the panels outline macroscopic, overturned D1 folds which have a northwest strike and a northeast vergence.

Mineralization appears to be confined to Devonian strata in panel B. In South Fluke Bowl the major D1 structure in panel B is a large syncline. Along strike to the northwest, this syncline is broken and becomes a significant D1 reverse fault. Drilling to date has been within the area where the reverse fault is present.

Structural patterns in panel B are further complicated by the local presence of mesoscopic, open to tight, vertical D2 folds. D2 deformation appears to be disharmonic with some normal faulting in fold hinge zones.

Late near-vertical normal faults of variable strike orientation disrupt all earlier deformation features. Generally displacement on these faults is less than 50 meters although larger displacements have been observed.

POTENTIAL TARGETS

Further exploration on the FLUKE claims is predicated upon several assumptions about the type of mineralization present. Geologic similarities indicate that the FLUKE mineralization is essentially identical to that present on the CIRQUE claims. Since the geologic framework of the CIRQUE massive sulphide deposit has been more extensively studied, a CIRQUE "model" is used to outline potential drill targets on the FLUKE claims.

Major features of the CIRQUE model applicable to the FLUKE are as follows:

(1) Significant Ba-Fe-Pb-Zn-Ag mineralization in the Earn Group is stratiform and confined to the Pregnant Shale Member of the Gunsteel Formation (DGPR).

(2) Laminated pyrite within DGPR is laterally equivalent to the massive barite-sulphide mineralization. Consequently thickening of the laminated pyrite horizon may be used to "point" towards potentially economic massive sulphide deposits.

(3) Soil and silt geochemical anomalies within DGPR are caused by the laminated pyrite horizon.

(4) The CIRQUE deposit is empirically associated with a thick ribbon chert sequence (DGCH) conformably overlying the Pregnant shale. Laterally southwest from the ore deposit area at CIRQUE the chert sequence is not present.

Given these constraints, potential drill targets on the FLUKE claims are restricted to panel B. This panel contains both the surface showings and geochemical anomalies indicating the presence of laminated pyrite. Furthermore, this panel also has a well developed DGCH overlying DGPR in the central part of the claim group.

Highest priority should be given to testing the down-dip extension of the Pook showing discovered in 1981. This showing contains barite - disseminated sulphide mineralization similar in nature to mineralization on the CIRQUE claims. Earlier drilling has closed off extension of this showing along strike to the northwest. However, extension of the showing down-dip to the southwest and along strike to the southeast has not been tested.

Drilling should also be completed in South Fluke Bowl to test the geochemical anomalies associated with DGPR. These anomalies are directly on strike to the southeast with the Pook Creek showing.

Three vertical cross-sections have been completed through areas selected as potential drill sites in these areas. These sections indicate that the target stratigraphic interval can be initially tested with drill holes that have a maximum depth of 500 meters.

Respectfully submitted,

L. C. Pigage

May, 1982

REFERENCES

CECILE, M. and NORFORD, B. 1979. Basin to platform transition, Lower Paleozoic strata of Ware and Trutch map areas, northeastern British Columbia. Geological Survey of Canada Paper 79-1A, 219-226.

GABRIELSE, H. 1981. Stratigraphy and structure of Road River and associated strata in Ware (West Half) map area, northern Rocky Mountains, British Columbia. Geological Survey of Canada Paper 81-1A, 201-207.

JACKSON, D., STEEN, G., and SYKES, D. 1965. Stratigraphy and graptolite zonation of the Kechika and Sandpile Groups in northeastern British Columbia. Bulletin Canadian Petroleum Geology 13, 139-154.

ROBERTS, W. 1979. Geological and Geochemical Report on the Fluke Group. C.A.M.C. internal report. 14p.

ROBERTS, W. 1981. Diamond Drilling Report on the Fluke Group. C.A.M.C. internal report. 6p.

GATAGA AREA STRATIGRAPHY[1]

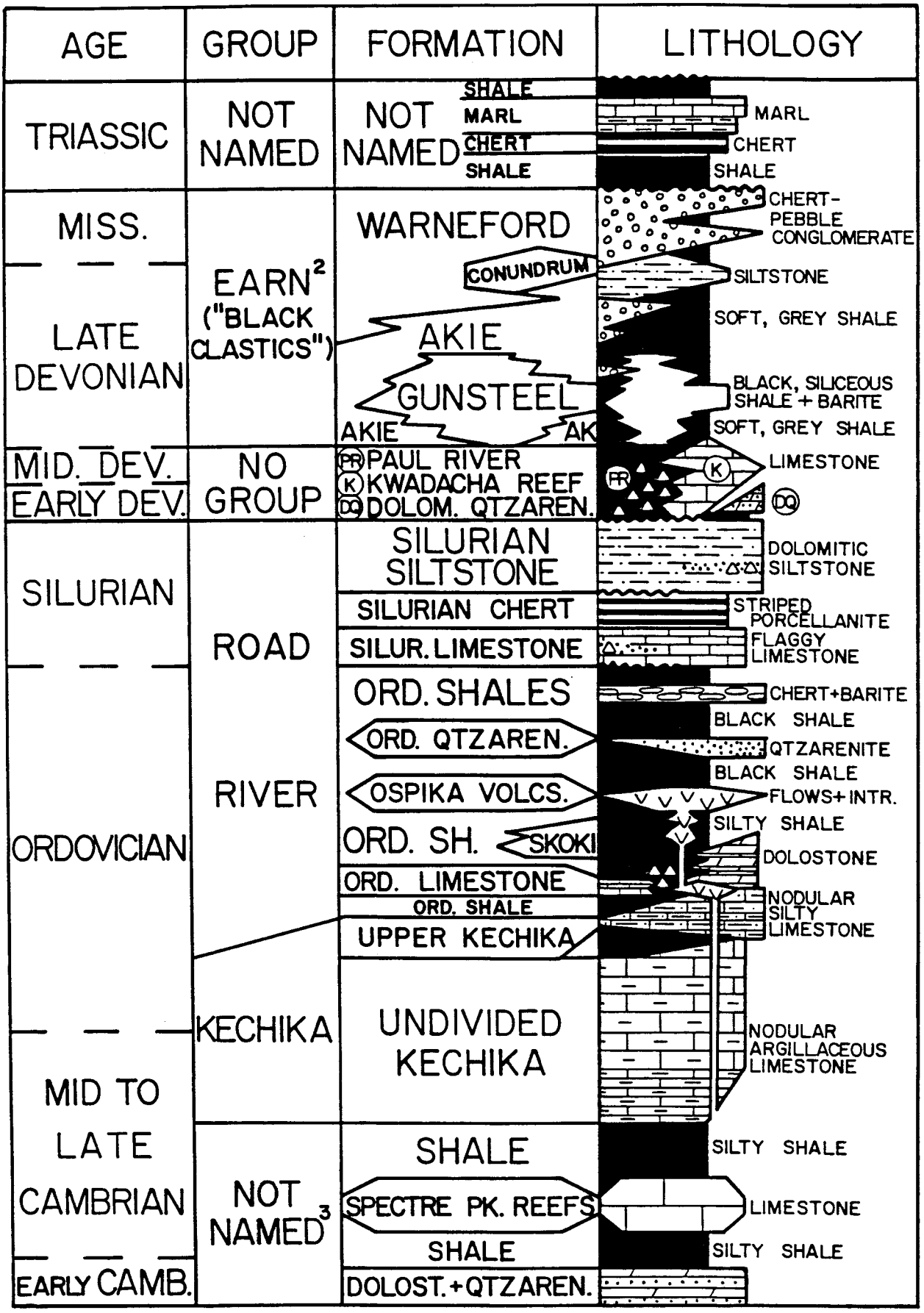


Figure 5

TABLE I

DETAILED STRATIGRAPHY MASTER[1]

May, 1982

GATAGA AREA (KECHIKA TROUGH)[2]

SYMBOL	COLOUR	UNIT	LITHOLOGY
RECENT			
OB			- Undivided overburden
OB_{SC}			- Soil - C - horizon or scree
OB_{RG}			- River gravel
OB_{TL}			- Till
LATE TERTIARY - Normal Faulting			
---- U	935		- Tectonic breccia of lithology designated in first four spaces.
---- F	935		- Graphitic shear and gouge zone of lithology designated in first four spaces.
---- Q	938		- Quartz - carbonate veins.
CRETACEOUS TO EARLY TERTIARY - Laramide Orogeny			
F_2	(feature)		- Second phase kink folds
F_1	(feature)		- First phase Laramide folds
S_2	(feature)		- Second phase crenulation cleavage
S_1	(feature)		- First phase axial planar cleavage
TRIASSIC (TR)			
TR_{ML}	945 (striped)		- Marl: shaly limestone, limestone to dolostone, buff to light grey weathering thinly irregularly bedded with abundant Monotis.
TR_{RC}	945 (striped)		- Chert: irregularly ribbon bedded with large composite nodules, graphitic partings.
TR_{SH}	945 (striped)		- Shale: brown-grey to black, silty.
WARNEFORD FORMATION (DM_W)			- Upper Devonian to Mississippian sandstones to conglomerates.
DM_{WC}	965		- Conglomerate: chert granule to pebble, also breccia, varicoloured, black to light silvery-grey weathering.
DM_{WQ}	944		- Quartzarenite: black, light grey weathering, siliceous, graphitic, laminated, could be $\equiv DC_{SH}$.
DM_{WT}	931		- Porcellanite: ribbon bedded black chert, bounded on both sides by Warneford on Fluke.
DM_{WB}	911		- Shale: dark grey to black, gunsteel to rusty weathering, hard, graphitic, competent coring but phyllitic lenticular cleavage when weathered; common intraformational breccia (DM_{WBI}) and/or chert and quartz sand to pebble conglomerate lenses (DM_{WBX}) $\equiv DA_{GH}$, DA_{ph}, DM_{WC}.
DM_{WM}	928		- Barite: unmineralized, massive, laminated, grey, grades to blebby barite in silty shale interbedded with conglomerates $\equiv DG_{BH}$.

SYMBOL	COLOUR	UNIT	LITHOLOGY
CONUNDRUM SILTSTONE (DC)			
DC_{SH}	945	Conundrum siltstone[4]	- Siltstone to breccia: light grey, speckled-weathering, soft, variably calcareous, pyritic, diffusely laminated, local individual burrows, exposed on Elf to Fluke; DA_{SH} may be fine-grained equivalent.
AKIE SHALE (DA)			- Upper Devonian to Mississippian soft shales and siltstones above mineralized barite
DA_{RS}	947	Rusty shale	- Shale: dark brown, rusty brown weathering, indistinctly bedded, with lithic sandstone and orange dolomitic siltstone interbeds, grades into DC_{SH} , DM_{WQ} , interbedded with DA_{PS} and DA_{PH} on Fluke.
DA_{PS}	951	Pinstriped shale	- Shale: dark brown-grey, light grey to rusty brown weathering, silty, distinctly laminated, ≡ DC_{SH}
DA_{TB}	943		- Siltstone: light to medium grey, dolomitic, fine grained, homogeneous texture, commonly tectonic breccia.
DA_{GH}	911	Graphitic shale[4]	- Shale: dark grey to black, rusty grey weathering, graphitic, competent, moderately hard, laminated, with discontinuous pyrite laminae, irregular planar cleavage; ≡ DA_{PH} , ≡ DM_{WB} .
DA_{SH}	946	Phyllitic siltstone[4]	- Siltstone: light to dark grey, speckled, variably calcareous, planar to irregularly laminated ± burrow mottled; phyllitic-graphitic lenticular cleavage; ≡ DA_{SF} , possibly finer facies of DC_{SH}.
DA_{PH}	920	Phyllitic shale[4]	- Shale: light to medium grey, rusty brown weathering, faintly laminated, soft, phyllitic, lenticular to slaty cleaved, ≡ DA_{PF} , ≡ DM_{WB} , ≡ DA_{GH} .
GUNSTEEL FORMATION (DG,DB)			- Upper Devonian to Mississippian siliceous shales and siltstones enclosing mineralization.
DG_{GS}	910	Undivided Gunsteel	- Shale: dark grey to black, silvery-grey (gunsteel) weathering, laminated.
DG_{Ch}	934	Hanging wall ribbon chert[4]	- Porcellanite: dark grey to black, silvery grey weathering, ribbon bedded (<5cm), with graphitic shale partings and interbeds ≡ DG_{CF}.
DB_{BH}	928	Hanging wall barren barite[4]	- Barite: unmineralized, laminated, white to grey; grading to blebby, calcareous, in black porcellanite; within DG_{CH}. Contains large limestone concretions; may be distinguished from DG_{BF} by distinct striped-weathering laminae.
DG_{TH}	913	Hanging wall poker chip shale[4]	- Shale to porcellanite: dark grey, silvery-grey weathering, distinct graphitic partings <3cm apart, commonly <1cm; laminated, commonly with siltstone laminae (DG_{IHT}); ≡DG_{PR} , DB; = DG_{PC} .
DG_{CM}	931	Chert marker beds	- Porcellanite: dark grey to black, massive to ribbon bedded, commonly with quartz veining, in one to several beds up to several meters thick, within DG_{PR}.
DG_{PR}	908	Pregnant shale	- Shale to porcellanite: dark grey to black, silvery-grey to rusty weathering, silty; bedding thicker than 3 cm, massive to laminated; good slaty cleavage in outcrop; ± nodules and laminae of barite, pyrite and calcite ≡ DG_{TH} , ≡ DB_{BS} , = DG_{BP} . Includes DG_{TH} on Fluke.
DG_{LB}	942	Laminar banded pyrite	- Pyrite: > 10%, very fine-grained, very finely laminated, interlaminated with siliceous ± calcareous shale and siltstone in beds 1 to 20 cm. thick; can have visible galena and sphalerite (DG_{LBE}); within DG_{PR}; ≡ DB.
DG_{SX}	944	Siltstone breccia	- Siltstone: light to medium grey, laminated to burrow mottled, dolomitic, siliceous, common intraformational breccia (DG_{SXI}) and conglomerate, confined to mineralized horizon; similar to S_{SS}; breccia has massive sulphide matrix in places.
DG_{DL}	940	Distinctly laminated unit	- Rhythmically interlaminated on a scale of about 1 cm: siliceous siltstone, fine-grained laminated pyrite, black siliceous shale ± blebby barite.
DB_{PY}	916	Pyrite	- Pyrite: > 80%, laminated, fine-grained, framboidal.
DB_{VN}	929	Veins and sweats	- Barite: medium to coarsely crystalline, common galena in strain shadows and irregular patches, in veins and sweats. Barite talus slopes at Cirque and Elf showings are dominated by this unit.

SYMBOL	COLOUR	UNIT	LITHOLOGY
GUNSTEEL FORMATION (Continued)			
DB_{ES}	923	Elf Showing	- Galena + sphalerite + calcite + barite + pyrite; massive, interlaminated, > 8% Pb + Zn over 10 cm. intervals; interbedded with Pregnant Shale on a scale of 1 to 10 cm; grades into DG_{LBE}. Intersections on South Cirque (81C37) are temporarily assigned to this unit.
DB_{MS}	925	Massive sulphides	- Pyrite, sphalerite ± galena: massive, medium to coarsely crystalline, ± minor barite.
DB_{SB}	922	Sulphides-barite	- High grade sphalerite, galena and pyrite with 20% < barite <60%; crudely laminated, crystalline.
DB_{BX}	921	Barite breccia	- Intraformational breccia of barite, often with siltstone fragments, locally coarse crystalline, with <40% irregular laminae and matrix of pyrite + barite.
DB_{BS}	918	Barite-sulphides	- Barite with <40% pyrite and <10% Pb + Zn: finely crystalline, irregularly to discontinuously interlaminated; minor barite nodules >1 cm. diameter.
DG_{BP}	907	Barren pregnant shale	- Shale to porcellanite: black, moderately to very siliceous, silty, graphitic S_0 partings 3-10 cm; diffuse pyrite laminae, poorly to well cleaved, barren of Pb-Zn mineralization, grades into DG_{TF} and DG_{CF}. Footwall to eastern DB; laterally equivalent to DG_{PR} and DB in "R" Creek and east of Gossan Fault.
DG_{TF}	912	Footwall poker chip shale[4]	- Shale to porcellanite: dark grey to black, silvery weathering, distinct graphitic partings < 3 cm apart, commonly 1 cm, internally finely laminated, common siltstone laminae = D_{PC}, DG_{TH}.
DB_{BF}	939	Footwall barren barite[4]	- Barite: unmineralized, laminated, light grey, rusty weathering, grading to blebby (BFB), calcareous, in black porcellanite, within DG_{CF}. Contains large limestone concretions (BFA), cephalopods = DB_{BH}.
DG_{CF}	956	Footwall ribbon chert[4]	- Porcellanite: dark grey to black, silvery-grey weathering, ribbon bedded (< 5 cm), with graphitic shale interlaminae and partings =DG_{CH}.
AKIE SHALE (DA)			- Devonian to Mississippian soft shales and siltstones below mineralized barite.
DA_{PF}	920	Phyllitic shale[4]	- Shale: grey weathering, soft, phyllitic, lenticular to platy cleaved = DA_{PH}, ≡DA_{GF}.
DA_{GF}	911	Graphitic shale[4]	- Shale: dark grey to black, rusty grey weathering, graphitic, competent, moderately hard, laminated, with discontinuous pyrite laminae, irregular planar cleavage. ≡ DA_{PF}.
DA_{SF}	943	Phyllitic siltstone[4]	- Siltstone: light to dark grey, speckled, variably calcareous, planar to irregularly laminated ± burrow mottled, with phyllitic-graphitic lenticular cleavage partings; = DA_{SH}.
DA_{SL}	941	Silty shale	- Silty shale: dark brown-grey, rusty brown weathering, medium hard to soft, massive to indistinctly laminated, interbedded with Conundrum Siltstone and extending northeast just above D_{KR} on Fluke and Pie claims.
GUNSTEEL FORMATION (DG)			- Devonian siliceous shales just above S_{SS} and below mineralization.
DG_{FT}	964	Footwall poker chip	- Shale: black, graphitic, poker chip partings, with common light grey siltstone beds = DG_{TF}.
DG_{FP}	933	Footwall pregnant shale	- Shale to porcellanite: black, massive coring, with common speckled siltstone, creamy and discontinuous pyrite laminae; on Elf includes large blebby calcite + quartz in sausage-like chains; interbedded with D_{PL}; = DG_{PR}.
CONUNDRUM SILTSTONE (DC)			
DC_{SF}		Conundrum Siltstone[4]	- Silty shale to granule breccia; speckled light and dark grey, soft, variably calcareous, pyritic, diffusely laminated. Intersected just above Kwadacha Reef in 1981 Fluke drill holes. = DC_{SH}.
KWADACHA and PESIKA REEFS			- Lower to Middle Devonian Limestone.
D_{KR}	919		- Limestone: grey, thick massive bedded, fossiliferous - stromatoporoid, coral, crinoid debris with some fossils in growth position.

-- UNCONFORMITY --

SYMBOL	COLOUR	UNIT	LITHOLOGY
PAUL RIVER FORMATION			- Lower (LD_L) to Middle (D_L) Devonian Shale containing coarse clastic rocks and/or graptolites; lateral equivalent of D_{KR} and LD_{PQ}.
D_{PC}	944		- Conglomerate: chert and siliceous siltstone fragments in siliceous black shale, could $\pm$ LD_{PX}.
D_{PP}	930		- Porcellanite: ribbon bedded, with fossiliferous limestone breccia beds; overlies D_{KR} east of Cirque.
D_{PL}	906		- Shale: black, with thin fossiliferous limestone turbidites, commonly with one and two-holed crinoids DC_{FP}.
LD_{PX}	906		- Siltstone to breccia: thin to thick graded beds, clasts of chert, quartz sand, pyritic siltstone and shale chips, interbedded with black ribbon porcellanite (D_{PP} ??) and black graphitic shale. Elf and Fluke, could $\pm$ DA_{CG}
DOLOMITIC QUARTZITE FORMATION			
LD_{PQ}	919		- Quartzite: grey, dolomitic, graded beds, fossil debris, rhythmically interbedded with black graptolitic shale, mapped on east side of Gataga Trough only.
			-- LOCAL UNCONFORMITY --
SILURIAN SILTSTONE (S_S)			- Middle to Late Silurian, top of Road River Group.
SS_{SX}	943		- Siltstone: medium grey, dolomitic, laminated, includes intraformational breccia - commonly at gradational to sharp contact between Devonian shale and S_S - paleo soil?
SS_{SC}	934		- Chert lenticles 1 to > 30 mm. long in black siliceous silty shale, commonly $\pm$ SS_{SX}.
S_{SH}	941		- Siltstone: shaly, recessive, laminated, variably calcareous.
S_{SB}	939		- Barite: unmineralized, light grey, laminated, slightly calcareous.
S_{SS}	940		- Siltstone: light orange-weathering, dolomitic, with common burrows, feeding fans and burrow mottling (S_{SSW}).
S_{SQ}	940		- Sandstone: quartzose, with coral and sponge fragments; rhythmic, massive graded beds; interbedded with black siltstone and shale.
S_{SL}	904		- Limestone: grey weathering, laminated or burrow mottled, silty - calcareous versions of S_{SSL} + S_{SSW}.
			-- LOCAL UNCONFORMITY --
SILURIAN CHERT (S_{RC})			- Early to Middle Silurian, Road River Group
S_{RC}	932	Silurian Chert	- Porcellanite (S_{RCS}): streaky white-striped, ribbon bedded, with black calcareous graptolitic shale partings, some dolomitic siltstone (S_{RCQ}) and large limestone concretions (S_{RCA}). Details in Facies Relationships diagram.
SILURIAN LIMESTONE (S_{RL})			- Early Silurian (Llandovery), Road River Group
S_{RL}	903	Silurian Limestone	- Limestone: grey, rhythmic, flaggy to blocky bedded, calcisiltite and fine calcarenite turbidites with graptolitic shale interbeds.
			-- LOCAL UNCONFORMITY --

SYMBOL	COLOUR	UNIT	LITHOLOGY
SHALE FACIES OF ROAD RIVER GROUP (O_{RR})			- Early to Late Ordovician
O_{RC}	933	Ordovician Chert	- Porcellanite: black(+ white?), ribbon bedded, with limestone concretions, mainly NW of Driftpile Creek.
O_{RG}	967	Ordovician Graptolitic Gunsteel	- Shale: black, silvery-grey (gunsteel) to black weathering, variably calcareous, graptolitic, minor chert, local barite horizons (OS_{RGB}).
O_{RQ}	963	Ordovician Quartzite	- Quartzose sandstone turbidites with minor dolomite, carbonate fossil fragments and graptolitic shale interbeds; mainly east of Akie Trough.
O_{RP}	936	Rusty Shale	- Shale: black, rusty and buff to light grey weathering, graptolitic, commonly calcareous.
O_{RD}	941	Dolostone	- Dolostone: orange weathering, silty, = S_{SS}; restricted to Gataga Trough.
O_{RS}	904	Silty Shale	- Silty Shale to Siltstone: dark grey, tan to pink weathering, laminated, graptolitic, variably calcareous, stratigraphically below to slightly above the Ospika Volcanics (O_V), includes breccia = O_{SK}.
O_{RL}	905	Ordovician Limestone	- Limestone: rhythmically flaggy bedded with graptolitic shale interbeds; yellow weathering.
O_{RN}	904	Nodular Shale	- Shale: black, buff to light grey weathering, limestone nodules, interdigitates with Upper Kechika.
OSPIKA VOLCANICS (O_V)			- Ordovician, in Road River shales O_{RN} to O_{RP}, from top of Kechika to just above O_{RL}.
O_{VF}	937		- Mafic to andesitic flows, locally amygdaloidal and phyllitic, massive flows to variolitic pillows.
O_{VX}	937		- Mixed volcanic and shale intraclast breccia and conglomerate.
O_{VT}	937		- Tuff and breccia: orange-weathering, flattened, siliceous (O_{VTS}) to highly calcareous (O_{VTK}).
O_{VG}	937		- Gabbroic-textured mafic sills within Kechika Group and Road River Shales.
SKOKI FORMATION (O_{SK})			
O_{SK}	901		- Dolostone: grey-buff laminated flaggy beds and intraformational breccia (O_{SKL}, O_{SKI}) or interbedded graptolitic shale and dolostone breccia with abundant corals and crinoids (O_{SKX}) or massive bedded fossiliferous dolostone -- Skoki Formation (O_{SKM}).
KECHIKA GROUP (ϵO_K, O_K)			
O_{KU}	902		- Limestone: yellowish-tan weathering, grey-brown, nodular, argillaceous, cliff-forming.
ϵO_{KL}	902		- Limestone: distinctly bedded, grey, phyllitic, nodular, argillaceous.
CAMBRIAN (Lϵ, Mϵ, ϵ)			- Early to Late Cambrian basinal facies.
ϵ_{SS}	928		- Shale: siliceous, silty, laminated, pinkish-buff weathering, resembles O_{RS}, encloses $M\epsilon_{LR}$.
$M\epsilon_{LR}$	902 (striped)	Spectre Peak Reefs	- Limestone: light grey, aphanitic with tiny tribolites - Middle Cambrian Reefs.
$L\epsilon_{AQ}$	928		- Rhythmically interbedded orange-weathering dolostone with Archeocyathids and quartzarenite with Skolithos.

MODIFIERS

~	Homotaxial to
=	Lithology similar to, but stratigraphic position different from
A	Calcite nodules, includes Septarian nodules
B	Barite nodules
C	Chert nodules
D	Dolomitic
E	Visible sphalerite ± galena laminae
F	Highly sheared - when alone denotes FAULT clay to sandy gouge
G	Carbonaceous or graphitic
H	Interbedded with shale
I	Intraformational breccia/conglomerate
J	Volcaniclastic or tuffaceous
K	Calcareous
L	Laminated i.e. bedding < 1 cm. (thin bedded = < 3 cm.)
M	Massive bedded
N	Nodular pyrite
Ø	Silty if shale; shaly if siltstone; i.e. silty shale!
P	Laminar banded pyrite
Q	Quartz veining
R	Disseminated pyrite
S	Siliceous
Ø	Non-siliceous
T	Siltstone laminae and thin beds (calcareous and non-calcareous) - usually turbidites
U	Tectonic (U-) Breccia - when alone denotes FAULT breccia
V	Veins of pyrite ± sphalerite ± galena ± quartz ± calcite ± barite
W	Bioturbated ("WORMY")
X	With conglomerate interbeds
Y	Pyrite laminae (individual)
Z	Disseminated sphalerite

1. In stratigraphic order wherever possible - see Facies Relationships and General Stratigraphy diagrams. After Cecile and Norford (1979), Fritz (1979), Gabrielse (1975, 1981), Gabrielse et al (1977) and Taylor et al (1979).

2. This is for the entire Gataga Area; not all units are present in each property.

3. Conversion chart correlating this with 1978, 1979, 1980 and 1981 legends - follows.

4. The hangwall and footwall versions of these members can be lithologically indistinguishable, in which case they are referred to as DG_C , DB_B , DG_T , DA_P , DA_G , DA_S , DC.

CORRELATION CHART OF LITHOSTRATIGRAPHIC COLUMNS

GATAGA AREA - 1978 to 1982

1982	1981	1980	1979	1978
		All logs incl. 1978, 1979 are updated to 1980		
RECENT				
OB	OB			
OB_{SC}	OB_{SC}			
OB_{RG}	OB_{RG}			
OB_{TL}	OB_{TL}			
LATE TERTIARY				
---- U	---- U			
---- F	---- F			
---- Q				
CRETACEOUS TO LATE TERTIARY				
F_2 (feature)				
S_2				
F_1	F_1 (feature)			
S_1	S_1 (feature)			
TRIASSIC				
TR_{ML}	TR_{CB}	10C	-	-
	TR_{ML}	10B	-	-
TR_{RC}	TR_{RC}	10D	-	-
TR_{SH}	TR_{SH}	10A	10A	-
WARNEFORD FORMATION				
DM_{WC}	DM_{WC}	DM_{CG} 9C, 9D	9C, 9D	uDM_{WG}
DM_{WQ}	DM_{WQ}	-	-	uD_{SQ}
DM_{WB}	DM_{WB}	DM_{PH} 9G, 9V	7C, 8U, 8V	-
DM_{WT}	-	-	-	-
DM_{WM}	-	-	-	-
CONUNDRUM SILTSTONE				
DC_{SH}	DM_{WT}	DM_{CS} 9E	7E	-

1982	1981	1980		1979	1978
AKIE SHALE					
DA_{RS}	DM_{WS}	DM_{SS}	9A	9A	uLM_{WS}
DA_{PS}	DM_{WP}	DM_{PS}	9B	7B, 9B	-
DA_{TB}	DG_{TB}	UD_{TB}	8Z	-	-
DA_{GH}	DM_{WR} / DG_{GR}	DM_{SH} / UD_{GR}	9F / 8V	7D / 8V	- / -
DA_{SH}	DG_{SH}	UD_{ST}	8Y, 8B	8B	-
DA_{PH}	DG_{PH}	UD_{PH}	8U	8U	-
GUNSTEEL FORMATION					
DG_{GS}	DG_{GS}	UD_{GS}	8W	8W	uD_{GS}
DG_{CH}	DG_{CH}	UD_{BC}	8D	8D	uD_{RC}
DG_{BH}	DG_{CHB}	UD_{BCB}	8DB	-	-
DG_{TH}	DG_{TH}	UD_{PC}	8T	-	uD_{AR}
DG_{CM}	DG_{C}	UD_{BC}	8D	-	-
DG_{PRB}	DG_{PRB}	UD_{PR}	8SB	8D	-
DG_{PR}	DG_{PR}	UD_{LM} / UD_{PR} / UD_{ST}	8C / 8S / 8Y (in ore)	8C / 8S / 8Y	uD_{AR} / uD_{AR} / -
DG_{LB}	DG_{LB}	UD_{LB}	8R	8R	uD_{LB}
DG_{SX}	DG_{SX}	UD_{DC}	8X	8X	-
DG_{DL}	DG_{DL}	UD_{DL}	8Q	8Q	-
DB_{PY}	DB_{PY}	UD_{PY}	8P	8P	uD_{PY}
DB_{VN}	DB_{VN}	UD	8M	8M	-
DB_{ES}	DB_{ES}	UD_{ES}	8L	8L	-
DB_{BPV}	DG_{PFV}	UD_{KN}	8K	-	-
DB_{MS}	DB_{MS}	UD_{MS}	8J	8K	-
DB_{SB}	DB_{SB}	UD_{SB}	8I	8I	-
DB_{BX}	DB_{BX}	UD_{BB}	8H	8H	-
DB_{BS}	DB_{BS}	UD_{BS}	8G	8G	uD_{BS}
DG_{BP}	DG_{PR}	UD_{PR}	8S	8S	uD_{AR}
DG_{TF}	DG_{TF}	UD_{GF} / UD_{TC}	8F / 8E	8F / 8E	- / -
DB_{BF}	DG_{CFB} / DB_{BA}	UD_{RCB} / UD_{BA}	8AB / 8N	8O / 8N	- / uD_{BA}

1982	1981	1980		1979	1978
GUNSTEEL FORMATION (Continued)					
DC_{CF}	DG_{CF}	UD_{RC}	8A	8A	uD_{RC}
DG_{C}	DG_{C}	-		-	-
DG_{FT}	DA_{PC}	LD_{PC}	6T	-	-
DG_{FP}	DA_{PR}	LD_{PR}	6G, 6S	6G	-
AKIE SHALE					
DA_{PF}	DG_{PF}	UD_{AP}	7C	7C	-
DA_{GF}	DG_{GF}	-		-	-
DA_{SF}	DG_{SF}	UD_{ST}	8B	8B	-
DA_{P}	DG_{P}	-		-	-
DA_{G}	DG_{G}	-		-	-
DA_{S}	DG_{S}	-		-	-
DA_{SL}	DA_{SL}	UD_{SS}	7A	7A	uD_{SS}
CONUNDRUM SILTSTONE					
DC_{SF}	-	-		-	-
KWADACHA AND PESIKA REEFS					
D_{KR}	D_{KR}	LD_{L}	6D	6A	mD_{L}
PAUL RIVER FORMATION					
D_{P}	-	-		6B	-
	LD_{PS}	LD_{GR}	6A	6F	-
D_{PC}	DA_{CG}	LD_{CG}	6I	None	-
D_{PP}	D_{PP}	LD_{RC}	6F	6E	-
D_{PL}	D_{PL}	LD_{CR}	6C	6C	-
LD_{PX}	LD_{PX}	LD_{BX}	6E	6D	-
DOLOMITIC QUARTZITE FORMATION					
LD_{PQ}	LD_{PQ}	LD_{QZ}	6B	6H	-

1982	1981	1980	1979	1978
SILURIAN SILTSTONE		S_{SS} 5	5	S_{SS}
SS_{SX}	DA_{SS}	LD_{SS} 6H	None	-
SS_{SC}	-	-	-	-
S_{SH}	S_{SH}	S_{SS} 5E	5A6	-
S_{SB}	-	-	-	-
S_{SS}	S_{SS}	S_{SS} 5D	5A	S_{SS}
S_{SQ}	S_{SQ}	S_{SS} 5B, C	5A5, 5A3	-
S_{SL}	S_{SL}	S_{SS} 5A	5B	-
SILURIAN CHERT				
S_{RC}	S_{RC}	S_{RC} 4K	-	-
SILURIAN LIMESTONE				
S_{RL}	S_{RL}	S_{L} 4J	4F, 4H	O_{LS}
ROAD RIVER ORDOVOCIAN SHALES				
O_{R}	OS_{RR}	OS_{RR} 4D	4A	OS_{RR}
O_{RC}	OS_{RC}	OS_{RC} 4E	4G	-
O_{RG}	OS_{RG}	OS_{GG} 4I	4C	-
O_{RQ}	OS_{RQ}	OS_{OZ} 4H	4E	-
O_{RR}	-	-	-	-
O_{RD}	OS_{RS}	OS_{SS} 4F	4B	-
O_{RS}	-	-	-	-
O_{RL}	OS_{RT}	OS_{LT} 4G	4D	-
O_{RN}	-	-	-	-
OSPIKA VOLCANICS		OV 3	2	O_{V}
O_{VF}	O_{VF}	OV_{F} 3E	2A2 + 2B2	-
O_{VX}	O_{VX}	OV_{BX} 3D	2B1	-
O_{VT}	O_{VT}	OV_{T} 3B, C	2A1 + 2B1 + 2C1	-
O_{VG}	O_{VG}	OV_{S} 3A	2C	-
SKOKI FORMATION				
O_{SK}	O_{SK}	OS_{K} 4A, B, C	3A, B, C	-

1982	1981	1980	1979	1978
KECHIKA GROUP		O_K 2	1	ϵO_K
O_{KU}	O_{KU}	O_{KU} 2B	1B	-
ϵO_{KL}	ϵO_{KL}	O_{KL} 2A	1A	-
CAMBRIAN ROCKS				
ϵ_{SS}	ϵ_{AS}	LC_{AS} 1A	0A	-
$M\epsilon_{LR}$	$M\epsilon_{LR}$	MC_L 1C	0C	-
$L\epsilon_{AQ}$	ϵ_{AQ}	LC_{AQ} 1B	0B	-

CORRELATION CHART OF MODIFIERS

GATAGA AREA - 1978 - 1982

1982	1980-81	1979							1978
ALL	ALL	Unit 8	Unit 7	Unit 6	Unit 5	Unit 4	Unit 3	Unit 2	NIL
A	A	3				3			
B	B,E,	5,3				4,3			
C	C	5,3				3			
D	D								
E									
F	F	8	3						
G	G	9		3					
H	H				6				
I	I	1		5	7	8			
J	V							3	
K	K	6	2	1		2	2		
L	L	7			4	6			
M	M				5			2	
N	N	5			2				
Ø	Ø,J	0	6,7						
P	P					5			
Q	Q								
R	R								
S	S	2	4	2		1	1		
⌀	⌀								
T	T	3	1	6					
U	U					7			
V									
W	W				1				
X	X								
Y	Y		5	4	2	5			
Z									