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RECORD 1978/103

MUNDOGIE 1:100 000 SHEET AREA

DATA RECORD

R.S. Needham, I.H. Crick, P.G. Stuart-Smith & *M.R. Roarty

Northern Territory Geological Survey

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ABSTRACT

This record contains a brief description of most of the rock units in the Mundogie 1:100 000 Sheet area and their relationships, with emphasis on changes from previous work, and data relating to fieldwork there during 1978. Thin-section descriptions, data relating to a scout-drilling program, and 1:100 000-scale reductions of the 1:25 000-scale field compilations are included.

Mapping during 1978 substantiated previously described relationships between the Carpentarian units, but there are significant changes in the understanding of the petrography, thickness, and correlation of some of the Lower Proterozoic units (Masson Formation, Stag Creek Volcanics, Mundogie Sandstone, Wildman Siltstone, Koolpin Formation, Gerowie Tuff, Shovel Billabong Andesite, Fisher Creek Siltstone, Zamu Dolerite, Cullen Granite).

INTRODUCTION

This report contains a brief description of the geology of the Mundogie 1:100 000 Sheet area in the Northern Territory, thin-section descriptions, data relating to a scout drilling program conducted as part of the field program, and 1:100 000-scale reductions of the 1:25 000-scale field compilations*. In the description of the geology, emphasis is placed on differences between our work and that of earlier workers. A full account of the geology of the Sheet area will be given in another, forthcoming Record.

A preliminary account of results was given by Needham & others (1978).

In 1973, Needham & others (1975) mapped the northeastern sector of the Sheet area using 1:16 000-scale black and photography. In 1977 we examined the whole area using 1:25 000-scale colour photography. The mapping was undertaken as part of the study of the geology, geophysics, and mineralisation of the Pine Creek Geosyncline. The 1977 fieldwork involved numerous ground traverses by Landrover and on foot, by four geologists, and the drilling of 53 scout rotary holes using a BMR Mayhew 1000 rig. The program was conducted in close liaison with a BMR geophysical party whose aim was to supplement outcrop information, mainly in the northern half of the area where exposures of bedrock are sparse. The geophysical results will be reported separately.

COMPILATION SHEETS

The Sheet area is covered by 16 compilation sheets, which are reproduced, as pairs reduced to 1:100 000 scale, in Figures 2-9. A reference for these sheets is given in Figure 10 which also contains an index to the compilation sheets and the key to map symbols and abbreviations used. The positions of the 212 samples thin-sectioned are plotted on the compilation sheets at 8-digit BMR sample submission numbers. The scout drill holes, and all known abandoned mines and prospects, including several Pb-Zn and Cu prospects not previously recorded, are also plotted on the compilation sheets. The 2443 field observation points, which represent an average sample density of 1 per km^2, are plotted on the air photos used in the field; these are available for examination.

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* Copies of these maps at their original 1:25 000 (approx.) scale can be obtained from - The Copy Service, Australian Government Printer (Production), P.O. Box 84, Canberra, A.C.T. 2600: price on application.

THIN SECTIONS

Thin-section descriptions are listed together with the rock units to which the sectioned specimens belong in Appendix 1. Only field descriptions are shown on the compilation sheets, so as to emphasise the characteristics of the exposed rocks. The thin-section descriptions have enabled us to make significant distinctions and hence subdivisions not possible through observing hand specimens alone. Representative hand specimens have been retained and are available for inspection.

DRILLING RESULTS

Eighteen scout holes were drilled with mainly stratigraphic aims; the other 35 were drilled mainly to identify the source of geophysical responses. Details of the holes are tabulated in Appendix 2.

Holes 1-5 formed a traverse designed to investigate the Koolpin Formation-Mundogie Sandstone contact; holes 6-14 and 21-36 investigated the source of geophysical patterns delineated in the western part of the Barramundie Creek plains area, east of the Mundogie Sandstone, and holes 45-53 investigated the stratigraphy on either side of the ridge of Mundogie Sandstone (previously Coirwong Greywacke) near the Cooinda-El Sherana road. The other holes were isolated and had different objectives. Drill core from all holes is available for inspection in the BMR Fyshwick Core & Cuttings Laboratory.

GEOLOGY

Generalised geology is shown in Figure 1. The positions of the geological boundaries, and the overall structure, differ little from the description given by Walpole & others (1968), but there are substantial differences in the understanding of the petrology of some of the major units, and in concepts of thickness and of correlation between some units.

Formal subdivision of the Masson Formation has not been attempted, but a broad two-fold stratigraphic sequence is recognised: a basal unit composed of mainly porous quartz sandstone with calcarenite, limestone, and

minor siltstone and shale; and an upper unit consisting of shale and feldspathic quartz greywacke. The pelitic rocks are commonly carbonaceous at depth, but are ubiquitously altered at surface to hematite siltstone. Exposures of carbonaceous rocks are confined to the hornfels zone around the Cullen Granite in the southwest, where the shale commonly contains chiastolite. The maximum thickness of the Masson Formation in the Mundogie Sheet area is about 2800 m. The Stag Creek Volcanics conformably overlies the Masson Formation, and is much more extensive than previously mapped. The unit includes altered basic volcanic breccia and lavas, tuff, and dark green tuffaceous shale, and is about 1000 m thick.

Two of the five phases of phases of Cullen Granite described by Walpole & others (1968) are present.

The *Mundogie Sandstone has been extended to include the Coirwong Greywacke, two subunits of the Mount Partridge Formation (Elp_2 & Elp_4 of Needham & others 1975) and also feldspathic quartzite and conglomerate previously mapped as part of the Masson Formation which form prominent outcrops north of Goodparla Homestead. These rocks are considered to be equivalent to the *Mundogie Sandstone because they are similar in lithology, they locally overlie the Masson Formation and Stag Creek Volcanics unconformably, and they underlie the Koolpin Formation. The thickness of the Mundogie Sandstone ranges from 300 m where previously mapped as Coirwong Greywacke or Masson Formation to about 1000 m in the Mundogie Hill area, to about 2600 m at Spring Peak (18 km northeast of Mundogie Hill).

In the extreme northwest of the Sheet area feldspathic sandstone, conglomerate, and siltstone of the *Mount Hooper Sandstone, at least 1100 m thick, are exposed in the core of a small dome surrounded by the *Wildman Siltstone, a 1500-m thick sequence of colour-banded siltstone, shale, quartz sandstone and quartz greywacke. The *Mount Hooper Sandstone and the *Mundogie Sandstone are considered to be probable correlatives because of their similar lithology and the fact that they are both overlain by the *Wildman Siltstone. In the Mount Partridge Range area pelites mapped as Elp_3 (Needham & others 1975) are now considered to be Wildman Siltstone. The base of the *Mount Hooper Sandstone is not exposed in the area, and the Masson Formation and Stag Creek Volcanics are faulted against the *Wildman

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* informal name

Siltstone. This faulted relationship is further complicated by poor exposure, tight folding, and faulting associated with a regional northwest-trending kink, which extends across the Pine Creek Geosyncline from the Mundogie Sheet area westwards to the Marrakai area; this kink was recognised as a change in regional strike from about 360° to about 020°, by Walpole & others (1968, p. 152).

The Koolpin Formation is a 1050-m-thick sequence of interbedded dolomite, siltstone carbonaceous shale, and volcanogenic sediments. In the north, the base of the formation is marked by a sandy dolomite breccia which grades southwards into more massive silicified dolomite with possible algal structures in places. In the central and southeastern parts of the Sheet area the base of the formation is marked by massive chert-banded ferruginous siltstone. The Koolpin Formation is overlain by tuff, argillite, chert-banded and nodular siltstone, and ferruginous siltstone of the *Gerowie Tuff which attains a maximum thickness in excess of 700 m near Shovel Billabong (Crick & others, 1978). Previously the *Gerowie Tuff was mapped as Gerowie Chert and as part of the Fisher Creek Siltstone. The tuff is readily distinguished by its higher radioactivity (60-90 cps compared with 20-30 cps from the Koolpin Formation).

A fine-grained variolitic andesite (the *Shovel Billabong Andesite) is commonly present adjacent to exposures of *Gerowie Tuff, and is probably a coeval extrusive.

The *Gerowie Tuff is terminated in the east by a north-striking high-angle reverse fault 6.5 km east of Shovel Billabong. East of this fault, metasiltstone, feldspathic sandstone, phyllite, greywacke, and arkose of the Fisher Creek Siltstone, and dolerite of the Zamu Dolerite, are exposed along the base of the Arnhem Land escarpment to near the southern end of the Mount Partridge Range, and also in an inlier in the Kombolgie Formation to the south. The relationship between the Fisher Creek Siltstone and the Koolpin Formation is concealed by scree, but is probably an unconformity.

In the extreme south of the Sheet area nodular and chert-banded siltstone and tuff form a south-plunging syncline unconformably overlying the Masson Formation. The sequence, mapped previously as the Golden Dyke Formation, is identical to the Koolpin Formation/*Gerowie Tuff sequence of the South Alligator Valley and is therefore correlated with it.

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* informal name

The Zamu Dolerite (Ferguson & Needham 1978) forms extensive sills in the Koolpin Formation and to a lesser extent in other Lower Proterozoic units. The Dolerite is folded with the sediments about subhorizontal fold axes. The intrusions comprise a tholeiitic differentiation suite of olivine dolerite, quartz dolerite, lamprophyre, and granophyre. The lamprophyre is readily distinguished in the field by its porphyritic texture and high radioactivity of 60 to 90 c.p.s. (2 to 3 x background). There is a broad gradation of mafic to felsic differentiates corresponding to younging in the sediments, i.e. olivine dolerite is present only in the Masson Formation, and granophyre is present only in the upper part of the Koolpin Formation.

A non-outcropping dolerite distinguished by a distinctive red soil and thick vegetation cover developed over a deep clayey weathering profile transgresses geological formations in the Barramundie Creek area. The dolerite intersected in one drillhole, postdates the 1800 m.y. regional metamorphic and deformation event and may be related to unnamed dolerite dykes in the northwest of the Jim Jim Sheet area (Needham, 1975).

In the southeastern part of the Sheet area, our mapping has substantiated previously described relationships between the Carpentarian units. The Edith River Volcanics contain trachyte, trachyandesite, ignimbrite, rhyolite, tuffaceous quartz sandstone, and pebbly quartz sandstone. The volcanic rocks have radioactivities of about 100 c.p.s.

Several small lead-zinc prospects not previously recorded lie in a linear gossanous zone in the Masson Formation trending northwest through the Namoona prospect. The gossanous zone is not present elsewhere in Masson Formation where the same stratigraphic level is exposed. Also in places it appears to transgress bedding trends. Hence it may be fault-controlled rather than stratiform. A small copper prospect was located in the Stag Creek Volcanics 3 km north of Namoona.

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APPENDIX 1. THIN-SECTION DESCRIPTIONS

(the compilation sheet number is given in brackets, at the end of each subheading)

72121359 Magnetitic quartz-muscovite schist (Wildman Siltstone, Elsw) (4)
Blebs, lenses, and bands of granuloblastic quartz grains with bands of foliated muscovite. Muscovite 70%, quartz 25%, euhedral magnetite porphyroblasts 5%, minor green tourmaline.

72121360 Ferruginous siltstone (hematite) (Mundogie Sandstone, Elu) (3)
Massive hematite - no primary minerals other than quartz identifiable.

72121361 Altered basic volcanic (Stag Creek Volcanics, Elv) (7)
Fine-grained fibrous pale green amphibole (actinolite), granular sphene, and epidote. Epidote and quartz infill small round vesicules.

72121362 Altered basic volcanic (Stag Creek Volcanics, Elv) (7)
Similar to 72121361. Also contains blebs of coarser-grained subprismatic green amphibole.

72121363 Phyllite (Koolpin Formation, Elk) (7)
Fine-grained foliated quartz and sericite. Strings of opaques (hematite, magnetite, or graphite?) - (too fine-grained for identification) parallel to bedding, and cleavage. Open fractures filled with quartz. Veins offset by minor displacements along cleavage - resulting in S-shaped quartz veins, bedding, and cleavage traces.

72121364 Banded chert (Koolpin Formation, Elk) (8)
Banded microcryptocrystalline granuloblastic quartz and hematite rock; minor muscovite.

72121365 Ferruginous foliated siltstone (Koolpin Formation, Elk) (8)
Foliated and knotted brownish sericite, microcrystalline quartz and Fe oxides.

72121383 Shale (Koolpin Formation, Elk) (8)

76121029 Quartz dolerite (Zamu Dolerite, Edi) (2)

Medium-grained, sericitised idiomorphic plagioclase crystals (< 3 mm) and subprismatic pale brown augite with interstitial finer-grained altered feldspar microlites, dark greenish amphibole, opaques and minor quartz. Augite altered to greenish brown hornblende.

7621030 Arkose (Wildman Siltstone, Elsw) (6)

Medium-grained, poorly sorted, closely packed subangular grains of plagioclase, microcline, alkali feldspar, and quartz. Matrix of fine-grained chlorite.

76121031 Variolite (Shovel Billabong Andesite, Evb) (6)

See description 77120018.

76121032 Silicified dolomite (Koolpin Formation, Elk) (6)

Fine-grained granoblastic quartz mosaic with patches and veins of coarser-grained granuloblastic quartz.

76121033 Tuffaceous siltstone (Gerowie Tuff, Eva) (6)

Curved, elongate and angular fragments of quartz, and rare feldspar in a recrystallised matrix of quartz, sericite, and opaques.

76121034 Cherty tuff (Gerowie Tuff, Eva) (6)

Fine-grained granoblastic mosaic of quartz, sericite, opaques, and feldspar.

76121035 Recrystallised crystal tuff (Gerowie Tuff, Eva) (6)

Curved and angular fragments of quartz, sodic plagioclase, and alkali feldspar in a patchily recrystallised matrix of granoblastic alkali feldspar, quartz and minor plagioclase, chlorite, and opaques.

76121036 Variolite (Shovel Billabong Andesite, Evb) (6)

See description 77120018.

76121037 Quartz dolerite (Zamu Dolerite, Edi) (6)

Coarse, subidiomorphic ragged twinned prisms of pale brown cpx (augite) often curved (< 1 cm) and partly replaced by green-brown hornblende. Idiomorphic sericitised plagioclase often rimmed by alkali feldspar. Interstitial anhedral quartz, minor graphically intergrown quartz and alkali feldspar, chlorite. Veined by carbonate and prehnite.

76121038 Silicified dolomite breccia (Koolpin Formation, Elk) (6)
Angular blocks and fragments of fine granoblastic quartz mosaic in a matrix of coarser granuloblastic quartz and limonite.

76121039 Pebbly quartz sandstone (Mundogie Sandstone, Elu) (6)
Poorly sorted subrounded grains of quartz, quartzite, and minor chert - cemented by optically continuous rims of quartz, sericite, and minor limonite. Most grains show undulose extinction. Sutured and some recrystallised grain boundaries.

76121040 Ferruginous siltstone (Wildman Siltstone, Elsw) (6)
Laminated fine-grained reddish brown Fe oxides, sericite and angular and elongate silty grains of quartz, and aligned plates of coarse sericite.

76121041 Ferruginous silty shale (Stag Creek Volcanics?, Elv) (6)
Alternating laminae of fine to coarser-grained reddish brown Fe oxides and sericite. Sericite forms angular grains, possibly as feldspar pseudomorphs.

76121042 Altered porphyritic basic volcanic (Stag Creek Volcanics, Elv) (10)
Idiomorphic phenocrysts of plagioclase (discrete or in aggregates) (< 4 mm) partly replaced by chlorite, colourless pale yellow epidote, sphene and albite? Groundmass consists of very fine-grained idiomorphic plagioclase, dark green chlorite (anomalous blue), minor epidote, sphene, and opaques.

76121043 Cherty tuff? (Gerowie Tuff, Eva) (6)
See description 76121034.

76121044 Ferruginous phyllite (Gerowie Tuff, Eva) (6)
Fine-grained foliated sericite and Fe oxides.

76121045 Quartz dolerite (Zamu Dolerite, Edi) (6)
Medium-grained subprismatic, pale brown to colourless cpx (augite); commonly altered to pale brownish green hornblende. Idiomorphic sericitised feldspar. Interstitial mesostasis of graphically intergrown quartz and alkali feldspar, anhedral quartz, euhedral K feldspar, euhedral opaques, and apatite needles. Trace epidote.

76121046 Quartz arenite (Wildman Siltstone, Plsw) (6)
Fine-grained, very poorly sorted, angular grains of quartz and chert in a recrystallised matrix of quartz, sericite, and Fe oxides.

76121047 Cherty tuff (Gerowie Tuff, Pva) (6)
See description 76121034.

76121048 Quartz dolerite (Zamu Dolerite, Pdi) (6)
See description 76121029.

72121049 Quartzite (Mundogie Sandstone, Plu) (5)
Coarse, moderately sorted, recrystallised quartz and minor chert grains. Relict well-rounded grain boundaries preserved in a few grains.

76121050 Tuffaceous shale (Stag Creek Volcanics, Plv) (6)
Graded laminae of pale green chlorite, opaques, sphene, and angular elongated silty grains of quartz, and plagioclase.

76121051 Quartz sandstone (Mundogie Sandstone, Plu) (6)
Very coarse, moderately sorted, well-rounded grains of quartz, minor chert, and sericitic rock (ex-feldspar?). Grains cemented by optically continuous quartz rims.

76121052 Basic volcanic breccia (Stag Creek Volcanics, Plv) (5)
Angular fragments of basic volcanic: consist of fine-grained sericitised plagioclase laths, granular sphene, interstitial chlorite, and minor subprismatic to subophitic cpx phenocrysts. Matrix consists of fibrous dark green chlorite (anomalous blue), granular sphene, prehnite, and minor quartz.

76121053 Tuffaceous greywacke (Gerowie Tuff, Pva) (2)
See description 76121056.

76121054 Ferruginous shale (Gerowie Tuff?, Pva) (6)
Fine-grained quartz, sericite, and limonite.

76121055 Silicified dolomite (Koolpin Formation, Plk) (6)
Fine-grained granoblastic quartz mosaic.

76121056 Tuffaceous greywacke (Gerowie Tuff, Pva) (6)
Coarse-grained, curved, elongate, angular and rarely euhedral crystal fragments of quartz, sodic plagioclase, alkali feldspar, biotite, and minor volcanic rock fragments (interlocking feldspar microlites) commonly sericitised in a matrix of the same composition and finer-grained allotriomorphic quartz, chlorite, and opaques.

76121057 Tuffaceous siltstone (Gerowie Tuff, Pva) (6)
See description 76121033. NB some glassy shards.

76121058 Basic volcanic breccia (Mugearite?) (Stag Creek Volcanics, Plv) (5)
Angular fragments of basic volcanic: consist of minor colourless idiomorphic cpx phenocrysts in a subtrachytic groundmass of plagioclase (oligoclase-andesine) microlites, granular cpx and dark green chlorite (anomalous blue). Some fractured rounded phenocrysts (chloritised) may be olivine? Matrix consists of prehnite, granoblastic albite and orthoclase, pale green chlorite, and carbonate.

76121059 Tuffaceous greywacke (Gerowie Tuff Pva) (2)
See description 76121056.

776121060 Quartzite (Mundogie Sandstone, Plu) (2)
Poorly sorted. See description for 76121049.

77120001 Altered basic volcanic breccia (Stag Creek Volcanics, Plv) (11)
Angular fragments consist of: fine, even-grained (<0.2 mm) interlocking plagioclase laths, slightly porphyritic texture; very altered to pale green chlorite, granular sphene, and colourless epidote. Matrix consists of pale green chlorite (anomalous blue interference colours), colourless prismatic epidote crystals (often in radiating clusters growing from volc. fragment into chlorite) and minor chalcedony, albite, carbonate and muscovite.

77120002 Sheared altered basic volcanic breccia (Stag Creek Volcanics, Plv (2)
Angular and stretched fragments of basic volcanic completely altered to chlorite and carbonate with relict trachytic or pilotaxitic fabric (aligned plag. laths) in foliated matrix of same composition - chlorite and carbonate.

77120003 Altered porphyritic basic volcanic (Stag Creek Volcanics, Elv) (15)
Phenocrysts of euhedral and glomeroporphyritic aggregates of feldspar (< 1 cm) completely psuedomorphed by epidote (strong yellow pleochroism), quartz (sutured boundaries), fine radiating fibrous chlorite and minor anomal. blue chlorite. Groundmass consists of granular sphene, irregular epidote patches, opaques (hematite?), quartz, and fibrous colourless chlorite? Some phenocrysts also pseudomorphed by hematite.

77120004 Altered basic volcanic (Stag Creek Volcanics, Elv) (11)
Fine-grained interlocking sodic plagioclase microlites, granular sphene, anhedral dark green chlorite (anomalous blue), fibrous colourless chlorite, and minor quartz. Contains numerous drusy cavities of quartz with green chlorite and minor carbonate cores. Sub-parallel alignment of microlites and subtle change in grain-size may be flow banding (fluidal texture).

77120005 Shale (Stag Creek Volcanics, Elv) (5)
Laminated fine-grained fibrous brownish to colourless chlorite, minor opaques (hematite) and quartz. Probably high volcanic component.

77120006 Tuffaceous siltstone (Stag Creek Volcanics, Elv) (6)
Mostly anhedral and fibrous pale green chlorite and granular and irregular hematite; minor curved and elongate splinters of quartz - probably a tuff.

77120007 Laminated tuffaceous siltstone (Stag Creek Volcanics, Elv) (10)
Graded laminae of pale green to colourless chlorite, sericite, opaques (hematite), and minor quartz.

77120008 Tuffaceous greywacke (Stag Creek Volcanics, Elv) (10)
Well-rounded grains (<2 mm) of quartz, chert, and altered basic volcanic (chlorite and hematite with relict subtrachytic texture). Matrix consists of chlorite, hematite, angular fragments of quartz and altered basic volcanic (plagioclase pseudomorphs).

77120009 Siltstone (Masson Formation?, Elm) (11)
Fine-grained sericite, quartz, and opaques (hematite).

15

77120010 Slate (Masson Formation, Plm) (15)
Very fine-grained sericite, opaques (carbonaceous material?), and trace quartz.

77120011 Altered olivine dolerite (Zamu Dolerite, Pdi) (14)
Ophitic fabric, large (<1 cm) subidiomorphic pale brown augite crystals, mould altered (sericitised) idiomorphic plagioclase crystals, and rounded clots of pale green chlorite (olivine pseudomorphs). Polygonal aggregates of chlorite are probably pseudomorphs of olivine. Accessory minerals include embayed opaques, pale brown biotite, and epidote. Most of the rock is altered to a pale green fibrous chlorite. Probably altered version of 77120030.

77120012 Altered olivine dolerite (Zamu Dolerite, Pdi) (15)
Description as for 77120011. Plus trace acicular apatite and mesostasis of quartz and altered alkali feldspar.

77120013 Altered olivine? dolerite (Zamu Dolerite, Pdi) (10)
See description 77120011. No pos. ID of olivine.

77120014 Quartz dolerite (Zamu Dolerite, Pdi) (12)
Medium grained (<2 mm), subprismatic subidiomorphic twinned pale brown augite (50%) partly encloses sericitised idiomorphic plagioclase (<2 mm) and rarely alkali feldspar which contains vermicular intergrowths of soda feldspar (perthite). Alkali feldspar also occurs as rims around plag. and a graphic intergrowth with quartz in an interstitial mesostasis (20%). Some cpx has schiller structure and may be inverted pigeonite. Accessory opaques, apatite needles, and biotite.

77120015 Olivine dolerite (Zamu Dolerite, Pdi) (15)
Description as for 77120030.

77120016 Medium grained quartz dolerite (Zamu Dolerite, Pdi) (11)
Similar to 77120021 (see description). Same as 7712022.

7120017 Altered olivine? dolerite (Zamu Dolerite, Edi) (9)
Fine grained ophitic texture. Large (<2 mm) subidiomorphic pale brown augite crystals mould partly altered (sericitised, chloritised) idiomorphic plagioclase crystals (<1 mm). Accessory minerals - skeletal opaque grains, granular sphene and interstitial quartz. Most of the rock is chloritised. Similar to 7712011 but finer grained and no positive ID of olivine.

77120018 Variolite (Shovel Billabong Andesite, Evb) (11)
Curved, radiating and sheaf like variolitic groupings of belonites (feldspar? microlites) in an amorphous glassy groundmass. Isolated sericitised idiomorphic plagioclase phenocrysts form nucleii for some clusters. Trace secondary epidote.

77120019 Altered porphyritic microdiorite (Zamu Dolerite, Edi) (11)
Medium grained (<5 mm) sericitised idiomorphic plagioclase, and pale brown prismatic cpx (augite) phenocrysts. In a fine grained groundmass of altered feldspar microlites acicular dark green amphibole, granular and skeletal opaques and interstitial quartz. Dark green amphibole also replaces most of the cpx.

77120020 Variolite (Shovel Billabong Andesite, Evb) (11)
See description 77120018.

77120021 Medium grained quartz dolerite (Zamu Dolerite, Edi) (11)
Medium grained (<5 mm) ragged subprismatic, subidiomorphic, twinned pale brown augite commonly altered to dark green chlorite and rarely greenish brown hornblende, partly encloses idiomorphic plagioclase which is commonly zoned. Interstitial mesostasis of graphically intergrown quartz and chloritised alkali feldspar, minor secondary brownish green biotite, carbonate and epidote. Opaques form large skeletal grains (hexagonal).

77120022 Medium grained quartz dolerite (or orthoclase diorite?) (Zamu Dolerite, Edi) (11)
Similar to 77120021 (see description). Same as 77120016.

77120023 Lamprophyre (Zamu Dolerite, Edi) (11)
Idiomorphic phenocrysts (<1 cm) of sericitised zoned plag and minor subidiomorphic pale brown cpx (augite chloritised in part) and quartz. Groundmass consists of fine grained allotriomorphic alkali feldspar, minor quartz, rounded opaques and pale green chlorite. Similar to 77120025.

77120024 Altered porphyritic olivine dolerite (Zamu Dolerite, Edi) (15)
Description as for 7712011. Except coarser grained porphyritic texture. Altered plagioclase phenocrysts (<1 cm) in a groundmass (<1 mm). Trace interstitial quartz and carbonate (secondary) also present.

77120025 Lamprophyre (Zamu Dolerite, Edi) (11)
Phenocrysts of idiomorphic medium grained (<5 mm) zoned sodic plagioclase, alkali feldspar (sericitised), rounded quartz and chlorite pseudomorphs after cpx? in a groundmass of anhedral crystals of orthoclase and sodic plagioclase. Accessory opaques and apatite. Pale brownish green chlorite and sericite are common alteration products.

77120026 Granophyre (Zamu Dolerite, Edi) (11)
Consists almost entirely of graphically intergrown alkali feldspar and quartz. Minor euhedral, fine grained (< 2 mm) alkali feldspar crystals, pale green chloritic clots, skeletal opaques and opaque needles. Accessory carbonate and sphene? Feldspar is commonly sericitised.

77120027 Porphyritic variolitic dolerite vein (Zamu Dolerite, Edi) (11)
(Crosscuts ophitic quartz dolerite). Phenocrysts (0.5 mm) of idiomorphic plagioclase (andesine/labradorite) and chlorite pseudomorphs after cpx? in groundmass of sheaf like groupings of longulites and amorphous glass. Rock is very similar to variolite (77120018).

77120028 Variolite (Shovel Billabong Andesite, Evb) (11)
Same as 77120018.

77120029 Quartz dolerite (Zamu Dolerite, Edi) (11)
Description as for 77120014.

77120030 Olivine dolerite (Zamu Dolerite, Edi) (15)
Similar to 77120015. Ophitic fabric. Large (< 0.5 cm) subidiomorphic crystals of pale brown augite mould idiomorphic plagioclase crystals and rounded olivine (minor chlorite alteration of crystal margins). Plagioclase is medium grained (< 2 mm) and rarely zoned. Alkali feldspar is present (< 2%) as rims on plagioclase or graphically intergrown with quartz as an interstitial mesostasis. Olivine (colourless fractured crystals) occurs as a medium grained rounded crystals or in polygonal aggregates - commonly altered to chlorite. Accessory minerals include irregular embayed opaques, trace (green-brown) biotite, carbonate, and apatite.

77120031 Feldspathic arenite hornfels (Fisher Creek Siltstone, Elf) (13)
Closely packed. Very fine grained, moderately to well sorted, subangular grains of plagioclase, alkali feldspar and quartz in matrix of fine grained recrystallised subidioblastic brown biotite. Quartz and feldspar recrystallised in part to polygonal grain boundaries. Accessory well rounded monazite.

77120032 Feldspathic greywacke (Fisher Creek Siltstone, Elf) (11)
Medium grained, very poorly sorted, angular grains of plagioclase, alkali feldspar, microcline, quartz and felsic volcanic rock fragments (fine grained mosaic of subidiomorphic alkali feldspar - very similar to spotted tuff of Gerowie tuff). Pale green chlorite and granular opaques form incipient foliation in closely packed fabric. Veined by quartz. Rock similar to 77120031.

77120033 Feldspathic greywacke (Fisher Creek Siltstone, Elf) (11)
See description of 77120032.

77120034 Altered intermediate basic volcanic (Shovel Billabong Andesite, Evb) (16)
See description of 77120137.

77120035 Granophyre (Zamu Dolerite, Pdi) (11)
Same as 77120026.

77120036 Altered ophitic dolerite (Zamu Dolerite, Pdi) (10)
Pale brown subidiomorphic augite with ophitic texture (< 1 cm) encloses idiomorphic plagioclase (completely sericitised and chloritised). Large irregular and skeletal opaque grains, trace biotite, carbonate and quartz. Augite altered to chlorite along cleavage and fracture traces. Similar to 7712011 but no positive ID of olivine.

77120037 Pelitic hornfels? (Gerowie Tuff?, Pva) (11)
Patchy fine to coarse grained granoblastic quartz, pale green chlorite and minor sericite.

77120038 Granophyre (Zamu Dolerite, Pdi) (11)
Description as for 77120026.

77120039 Granophyre (Zamu Dolerite, Pdi) (12)
Same as 77120026. More chloritic and anhedral quartz.

77120040 Argillite (Gerowie Tuff, Pva) (11)
Cryptocrystalline quartz, pale green chlorite, opaques (limonite) and minor angular quartz grains.

77120041 Lithic arenite (Gerowie Tuff, Pva) (11)
Fine to medium grained, poorly sorted, angular grains of quartz, sericitised rock fragments (feldspar, volc rock?) and minor chert in a matrix of fine grained sericite, quartz, opaques and trace well rounded monazite and muscovite flakes.

77120042 Ignimbrite? (tuffite) (Gerowie Tuff, Pva) (12)
Angular, curved, rounded crystal fragments of quartz, sericitised feldspar? and minor felsic volcanic rock in a groundmass of very fine grained allotriomorphic quartz and sericite showing a relict eutaxitic texture?

77120043 Argillite (Gerowie Tuff, Eva) (12)

Fine grained granoblastic quartz and pale green chlorite mosaic containing isolated angular silty grains of quartz and sericitised feldspar?

77120044 Ignimbrite? (tuffite) (Gerowie Tuff, Eva) (11)

Angular, curved, rounded and resorbed crystal fragments of quartz, seritised feldspar and volcanic rock in a groundmass of finer grained crystal mush and devitrified glass (quartz, chlorite, opaque) showing a relict eutaxitic texture.

77120045 Phyllite (Gerowie Tuff, Eva) (11)

Fine grained foliated sericite (granular opaques, minor quartz) containing angular splinters and crystal fragments of quartz and chert. Foliated variety of argillite.

77120046 Phyllite (Gerowie Tuff, Eva) (16)

As for 77120045

77120047 Feldspathic volcarenite (Gerowie Tuff, Eva (2)

Coarse grained, poorly sorted angular grains of alkali feldspar, quartz, plagioclase and felsic volcanic rock. Sericitic alteration common, trace epidote. Volcanic rock fragments composed of:

- allotriomorphic alkali feldspar - quartz mosaic
- microperthite
- graphite intergrowths of quartz and feldspar
- rhyolite - quartz phenocrysts in alltriomorphic mosaic of alkali feldspar and quartz.
- interlocking plagioclase laths

77120048 Laminated argillite (Gerowie Tuff, Eva) (16)

Fine grained mosaic of granoblastic quartz, chlorite and opaques - silty laminae, veined by quartz.

77120049 Volcanic lithic greywacke with chert nodules (Gerowie Tuff, Eva) (11)

See description 77120050. Well rounded chert nodules (< 2 cm) in "volcanic lithic greywacke" matrix.

77120050 Volcanic lithic greywacke (Gerowie Tuff, Eva) (11)
Very poorly sorted. Angular fragments of sericitised feldspar and altered volcanic rock (ferruginous, sericitic rock with relict hyalopilitic texture), round quartz grains and rounded "argillite" clasts (<1 cm). Finer grained matrix of same composition.

77120051 Granophyre (Zamu Dolerite, Edi) (11)
See description 77120026.

77120052 Quartz greywacke (Poorly sorted lithic quartz sandstone?) (Gerowie Tuff, Eva) (15)
Fine to coarse grained, very poorly sorted, angular to subrounded quartz, chert, sericitic rock (feldspar?), argillite and trace tourmaline. Limonite and sericitic alteration.

77120053 Quartz greywacke (Gerowie Tuff, Eva) (11)
Description as for 77120052. Also minor volcanic rock fragments.

77120054 Ferruginous siltstone with chert bands and nodules (Koolpin Formation, Elk) (11)
Thinly bedded, alternating bands of cryptocrystalline quartz and fine grained hematitic rich cryptocrystalline quartz. Rounded nodules consist of fine grained granoblastic quartz mosaic. Bedding wraps around nodules.

77120055 Jasper (Koolpin Formation, Elk) (11)
Blood red cryptocrystalline quartz containing microfractures of quartz and specular hematite.

77120056 Banded iron formation (Koolpin Formation, Elk) (11)
Amorphous limonite and crystalline hematite rock containing bands of cryptocrystalline quartz.

77120057 Silicified dolomite (massive) (Koolpin Formation, Elk) (11)
Patchy granuloblastic quartz mosaic to cryptocrystalline. Veined by quartz and limonite.

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77120058 Massive silicified dolomite (Koolpin Formation, Elk) (2)
Fine grained mosaic of granuloblastic quartz. Veined by quartz.

77120059 Massive silicified dolomite (Koolpin Formation, Elk (2)
Consists entirely of quartz which occurs as a fine grained crptocrystalline mosaic and as radial growths rimming coarser grained patches. Scattered carbonate moulds (rhombs).

77120060 Quartz sandstone (matrix of dolomite breccia) (Koolpin Formation, Elk) (1)
Medium to coarse grained, poorly sorted, rounded to well rounded quartz grains cemented by thin quartz rims (optically continuous), fine grained quartz, sericite and opaques. Sandstone is matrix to silicified dolomite breccia - angular fragments of quartz mosaic.

77120061 Laminated silicified dolomite (Koolpin Formation, Elk) (1)
Patchy laminae of fine to coarse grained granoblastic quartz mosaic, containing wavy lines of fine grained opaques.

77120062 Silicified carbonate (columnar solution structures) (Koolpin Formation, Elk)
Probably silicified stalactites (or mites). Radial and concentric growths of quartz infilled by coarser grained polygonal quartz. Carbonate moulds (rhombs) are scattered throughout.

77120063 Silicified dolomite (Koolpin Formation, Elk) (2)
Spherical solution structures. Concentric and radial growths of quartz and minor limonite. Carbonate moulds (rhombs) present.

77120064 Limonitic rock (Koolpin Formation, Elk) (1)
Yellowish brown limonite containing angular fragments of strained quartz. Possibly ferruginous capping on dolomite.

77120065 Laminated hematitic chert (BIF?) (Koolpin Formation, Elk) (3)
Cryptocrystalline quartz and sericite containing laminae of finely crystalline hematite.

77120066 Nodular silicified dolomite (Koolpin Formation, Elk) (2)
Compacted nodules (with limonitic rims) consisting of fine grained granoblastic quartz mosaic. Carbonate moulds (rhombs) common.

77120067 Silicified dolomite breccia (Koolpin Formation, Plk) (6)
Angular blocks of coarse grained granuloblastic and radial quartz (containing carbonate moulds) in a matrix of fine grained quartz mosaic.

77120068 Lithic sandstone? (tuffaceous?) (Gerowie Tuff, Pva) (16)
Very fine grained, poorly sorted angular crystal fragments of quartz, sericitic rock and minor chert in a matrix of pale brownish green chlorite?, sericite, opaques and quartz.

77120069 Quartz pebble conglomerate (Mundogie Sandstone, Plu) (10)
Well rounded pebbles (< 4 mm) of quartz and minor grey and pink chert. Sandy matrix of recrystallised granoblastic quartz, pale brown (ferruginous) biotite, and sericite.

77120070 Chert pebble conglomerate (Mount Hooper Sandstone, Plh) (1)
Subangular pebbles (< 2 cm) of white chert (probably silicified dolomite?) and quartz in a recrystallised sandy matrix of granoblastic quartz and trace well rounded monazite grains. Secondary hematite along fractures.

77120071 Pebbly quartzite (Mundogie Sandstone, Plu) (11)
Rounded pebbles (< 1 cm) of quartz and quartz-sericite rock in a poorly sorted recrystallised, granoblastic quartz matrix. Relict grain boundaries are well rounded with secondary infilling quartz rims, and form a closely packed fabric.

77120072 Feldspathic quartz sandstone (Mundogie Sandstone, Plu) (15)
Coarse grained (0.25 - 1 mm) well rounded quartz and sericitised feldspar (plagioclase, microcline, alkali) cemented by optically continuous quartz rims. Poorly sorted; closely packed fabric.

77120073 Feldspathic quartz sandstone (Mundogie Sandstone, Plu) (10)
Fine grained (< 0.25 mm) well rounded quartz and sericitised feldspar? grains cemented by optically continuous quartz rims. Moderately sorted, closely packed, trace well rounded monazite and euhedral tourmaline.

77120074 Hematitic quartz sandstone (Mount Hooper Sandstone, Plh) (1)
Very fine grained subangular quartz and minor chert grains cemented by optically continuous quartz rims, hematite and secondary sericite. Hematite rich bands represent ferruginous silty laminae. Trace well rounded monazite and secondary tourmaline.

77120075 Impure sandy carbonate (Masson Formation, Plm) (14)
Coarse grained(0.5 mm) recrystallised granuloblastic carbonate, quartz and foliated sericite.

77120076 Fine grained limestone (Masson Formation, Plm) (10)
Very fine grained granoblastic carbonate with minor quartz and aligned opaque mineral - trace unstrained aligned muscovite discordant with main foliation.

77120077 Calcareous tuffaceous feldspathic quartz greywacke (Masson Formation, Plm) (9)
Poorly sorted angular fragments of quartz, feldspar (plagioclase, microcline, alkali), volcanic rock (interlocking plagioclase laths), in a matrix of finer grained material of same composition (mostly chloritised volcanic), carbonate and trace tourmaline, sphene, and monazite. Quartz grains tend to be more rounded than others. Grain size 0.5 - 1 mm.

77120078 Feldspathic quartz greywacke (Masson Formation, Plm) (13)
Very coarse grained (2 mm), poorly sorted.
Subangular grains of quartz, alkali feldspar (microperthitic texture in some) and minor sodic plagioclase in finer grained matrix (0.1 mm) of same composition, and chlorite (anomalous blue interference colours) opaques and trace clinozoisite?, apatite, and hematite? (hexagonal). Minor recrystallisation of matrix quartz and alteration of feldspars to sericite.

77120079 Feldspathic quartz greywacke (Masson Formation, Plm) (13)
As for 77120078 but slightly less feldspar (particularly plagioclase) and finer grained (1 mm).

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77120080 Calcarenite (Masson Formation, Elm) (15)
Similar to 77120083. Subrounded, moderately sorted (1-2 mm) grains of fine grained carbonate (same as 77120076) and quartz in matrix of coarser recrystallised carbonate, quartz. Total composition about 50% quartz, and 50% carbonate.

77120081 Calcareous greywacke (Masson Formation, Elm) (14)
Very poorly sorted, coarse (1 mm) rounded grains of fine grained limestone (same as 77120076) and minor quartz in a matrix of very fine grained ($< 0.1/10$ mm) carbonate, angular quartz and trace curved muscovite. Matrix comprises about 50% of rock.

77120082 Volcanic breccia (Stag Creek Volcanics, Elv) (9)
Angular carbonated volcanic rock and mineral fragments consisting of interlocking plagioclase laths (0.25 mm) with interstitial chlorite and opaques - (feldspars altered to carbonate.). Quartz and feldspar (carbonated) also as mineral fragments in a fine grained matrix of same composition.

77120083 Calcarenite (Masson Formation, Elm) (10)
Similar to 77120080. Poorly sorted, medium to coarse grained (0.25-1 mm). Subrounded grains of fine grained carbonate (same as 77120076) minor quartz and clots of sericite in a matrix of recrystallised coarser grained quartz, carbonate and trace muscovite.

77120084 Silty limestone (Masson Formation, Elm) (14)
Very fine grained carbonate (50%) and quartz; minor sericite and opaques. Laminated - varying proportions of mineral constituents.

77120085 Altered volcanic? (Stag Creek Volcanics, Elv) (10)
Very fine grained chlorite, quartz, sphene? and minor opaques and carbonate, laminated.

77120086 Fine grained calcarenite (Masson Formation, Elm) (10)
Moderately sorted, fine grained (0.2 mm), angular grains of fine grained carbonate? and quartz in a recrystallised matrix of finer grained quartz, carbonate and sericite.

77120087 Calcareous quartz sandstone hornfels? (Masson Formation, Elm) (14)
Poorly sorted, coarse grained (1 mm) rounded quartz grains in a matrix of radiating tremolite needles and carbonate, trace plagioclase grains.

77120088 Quartz sandstone (Masson Formation, Elm) (10)
Closely packed, well sorted, coarse grained (1 mm) subangular to rounded quartz grains in a matrix of fine grained granoblastic quartz, minor sericite clots, and trace muscovite. Sutured boundaries of grains indicate some recrystallisation.

77120089 Quartz pebble conglomerate (Masson Formation, Elm) (14)
Subangular to rounded pebbles (<1 cm) of quartz and minor jasper, chert (fine grained granoblastic quartz) and kaolinised feldspar in medium grained sandy matrix of angular quartz, sericite and muscovite - trace rounded monazite grains.

77120090 Siltstone (Masson Formation, Elm) (15)
Very fine grained recrystallised quartz, sericite, opaques and poikolitic porphyroblasts of unstrained muscovite (0.5 mm).

77120091 Silty shale (Masson Formation, Elm) (9)
Angular grains of quartz, sericite (also rare sericite pseudomorphs after feldspar) elongate opaques and granular limonite - foliated - aligned parallel to cleavage - also alignment parallel to bedding.

77120092 Altered volcanic (Edith River Volcanics, Ehe) (11)
Fine grained quartz, sericite and opaques with relict eutaxitic structure - rounded spots may be vesicles? Similar to 77120104, 105.

77120093 Quartzite (Masson Formation, Elm) (9)
Moderately sorted, coarse grained (0.5-1.0 mm), interlocking quartz grains with minor muscovite clots and kaolinised feldspar (ground out of section) - some grains show well rounded boundaries inside recrystallised quartz rims, trace rounded monazite grains.

77120094 Chert (Masson Formation, Elm) (1)

A laminated very fine grained mosaic of quartz, pale chlorite and minor granular sphene? and clinozoisite? Laminae are formed by differing grain size.

77120095 Cordierite? - quartz hornfels (Masson Formation, Elm) (9)

Polygonal quartz, cordierite (containing rounded inclusions of quartz and tourmaline, large poikolitic muscovite, minor opaques, biotite and tourmaline. Hornfelsed siltstone?

77120096 Benmoreite (trachyandesite) (Edith River Volcanics, Ehe) (15)

Porphyritic fabric. Phenocrysts (< 2 mm) of subhedral twinned colourless clinopyroxene (augite?) commonly replaced by pale green chlorite and opaques, and euhedral plagioclase - completely sericitised or carbonated. Groundmass has subtrachytic fabric, fine grained (0.1 mm) plagioclase laths (andesine?), subhedral clinopyroxene prisms, magnetite octahedra and interstitial K feldspar quartz and minor chlorite.

77120097 Altered porphyritic volcanic. (Trachyte?) (Edith River Volcanics, Ehe) (15)

Phenocrysts: subhedral plagioclase? completely pseudomorphed by carbonate and quartz; subhedral mafic mineral (clinopyroxene?) now replaced by chlorite. Groundmass consists of plagioclase laths (0.1 mm), chlorite and carbonate. Similar to 77120096.

77120098 Ignimbrite (Edith River Volcanics, Ehe) (3-5.5 km east of El Sherana airstrip)

(i.e. welded tuff). Euhedral crystals and broken fragments of quartz (< 2 mm) and sericitised feldspar in a siliceous base containing devitrified shards of glass (that have a eutaxitic texture) and smaller fragments of quartz, also small patches of deuteric chalcedony? Similar to 77120099, 77120100.

77120099 Ignimbrite (rhyolitic) (Edith River Volcanics Ehe) (3-5.5 km east of El Sherana airstrip)
Rounded and rarely euhedral crystal fragments of quartz in a base of microcrystalline alkali felspar, quartz and minor clots of chlorite, trace euhedral monazite? Quartz crystals commonly embayed and rimmed by alkali felspar? Either rhyolitic flow or devitrified welded tuff as some indication of eutaxitic texture. Similar to 77120098, 77120100, 77120101.

77120100 Ignimbrite. (Edith River Volcanics, Ehe) (3-5.5 km east of El Sherana airstrip)
Same as 77120099, 101 and similar to 77120098.

77120101 Ignimbrite (Edith River Volcanics, Ehe) (16)
Same as 77120098, 99, 100.

77120102 Rhyolite (Edith River Volcanics, Ehe) (3-5.5 km east of El Sherana airstrip)
Porphyritic; sub-euhedral to euhedral phenocrysts of quartz (2 mm) with alkali feldspar rims in groundmass of granoblastic alkali feldspar, quartz and chlorite; minor tabular clots of chlorite and hematite may be pseudomorphs of biotite? Similar to ignimbrite 77120098-77120101.

77120103 Layered welded tuff (ignimbrite) (Edith River Volcanics, Ehe) (16)
Layers of fine to coarse grained alkali feldspar and quartz containing minor quartz crystal fragments (with alkali feldspar rims) and mafic clots of chlorite and opaques - the latter are streaked out and oriented at right angles to layering - this is probably caused by a fracture cleavage?

77120104 Altered volcanic (ignimbrite?) (Edith River Volcanics, Ehe) (16)
Fine grained quartz, sericite? opaques with relict eutaxitic texture. Similar to 77120092, 77120105.

77120105 Altered volcanic (ignimbrite?) (Edith River Volcanics, Phe) (3-5.5 km east of El Sherana airstrip)

Fragmental-brecciated texture. Fine grained quartz, sericite and opaques (hematite) with relict eutaxitic texture. Elongate crystals or columnar aggregates of clinozoisite? (Deuteric alteration). Similar to 77120092, 77120104.

77120106 Foliated quartz sandstone (Fisher Creek Siltstone, Plf) (12)

Coarse grained, very poorly sorted, angular grains of quartz, chert and quartzite; minor sericitic (feldspar?) rock fragments in a finer grained foliated matrix of the same composition containing aligned sericite and minor deformed muscovite. Trace well rounded monazite and tourmaline.

77120107 Feldspathic lithic quartz sandstone (Fisher Creek Siltstone, Plf) (12)

Fine to medium grained, very poorly sorted, very angular fragments and elongate splinters of quartz, chert, feldspar (plagioclase and alkali) in a fine grained chloritic matrix of the same composition + biotite, muscovite and opaques.

77120108 Ferruginous fine grained lithic quartz sandstone (Mount Hooper Sandstone, Plh) (5)

Angular fragments of quartz in greenish brown hematitic, sericitic matrix (30%), and possibly altered lithic fragments. Alignment of recrystallised sericite imparts a weak foliation. Trace rounded tourmaline fragments.

77120109 Quartz sandstone (Mount Hooper Sandstone, Plh) (1)

Poorly sorted, medium grained, angular grains of strained quartz and sericitised feldspar (50%) and trace chert, tourmaline and monazite? Tourmaline and monazite are well rounded. Closely packed with minor recrystallised quartz, sericite and hematite. Grain size 0.1-0.5 mm, mostly 0.25 mm.

77120110 Hematitic siltstone (Fisher Creek Siltstone, Plf) (12)

Laminated. Hematite, quartz and sericite in varying proportions.

77120111 Chert (Kombolgie Formation, Ehk) (11)
Fine grained mosaic of quartz and trace limonite; elongate quartz grains.

77120112 Feldspathic lithic quartz sandstone (Fisher Creek Siltstone Elf) (12)
See description 77120107.

77120113 Feldspathic quartz sandstone (Fisher Creek Siltstone, Elf) (12)
See description 77120106.

77120114 Silicified carbonaceous carbonate rock? (Koolpin Formation, Elk) (8)
Very fine grained granuloblastic mosaic of quartz containing foliated bands of finer grained quartz and fine opaque (carbonaceous) material, trace euhedral pyrite.

77120115 Foliated pebbly quartzite (Mundogie Sandstone, Elu) (8)
Poorly sorted, subrounded, very coarse grained quartz and minor chert in a sheared and recrystallised matrix of granuloblastic quartz and foliated sericite. Trace well rounded monazite.

77120116 Sheared quartzite (Mundogie Sandstone, Elu) (8)
Very coarse grained subrounded quartz grains in matrix of finer grained granoblastic quartz and minor sericite. Quartz grains and matrix quartz are sheared and show undulose extinction and elongation parallel to foliation.

77120117 Argillite (Fisher Creek Siltstone?, Elf) (11)
Foliated very fine grained sericite and quartz, trace idioblastic tourmaline.

77120118 Very coarse grained quartz sandstone (Kombolgie Formation, Ehk) (11)
Subangular grains (0.5-2 mm) of quartz, minor quartzite and chert in matrix of recrystallised granoblastic quartz, sericite and opaque (limonite?). Grain boundaries sutured and recrystallised.

77120119 Medium grained quartz sandstone(Kombolgie Formation, Ehk) (5.5 km east of El Sherana airstrip)
Sub to well rounded grains of quartz, minor quartzite and altered felsic volcanics? (Edith River Volcanics?) Quartz and limonite. Rims on grains also form cement with sericite and trace rounded monazite, tourmaline and clinozoisite?

77120120 Tuffaceous pebbly quartz sandstone (Edith River Volcanics, Phe) 3-5.5 km east of El Sherana airstrip)

Well rounded, coarse grained quartz, minor quartzite and felsic volcanic grains - secondary quartz rims around grains - Matrix consists of fine grained felsic volcanic material (quartz, sericite, and hematite) and trace well rounded tourmaline and monazite.

77120121 Volcanic greywacke (Kombolgie Formation, Phk) (15)

Graded bedding. Angular to subrounded fragments and splinters of felsic volcanics (felted texture - devitrified glass), quartz, in altered volcanic matrix (sericite, quartz, hematite?) pebbles up to 2 cm, grading to 0.1 mm (fine sand).

77120122 Quartz sandstone (Kombolgie Formation, Phk) (15)

Coarse grained angular and rarely rounded grains of quartz and quartzite cemented by minor secondary quartz rims. Recrystallised matrix of greenish brown mica (biotite?) and quartz. Grain boundaries partly recrystallised and interlocking.

77120123 Laminated silty shale (Wildman Siltstone, Plsw) (5)

Alternating bands of white shale (sericite, minor quartz) and silt (Fe oxides and quartz).

77120124 Quartz sandstone (Wildman Siltstone, Plsw) (1)

Coarse grained subangular grains of quartz and trace chert cemented by finer grained recrystallised quartz and trace muscovite. Most quartz grains show strained extinction. Minor "holes" may be weathered out feldspar or lithic fragments.

77120125 Quartz sandstone (Masson Formation, Plm) (1)

Very coarse grained (1-2 mm). Well sorted, well rounded grains of quartz and minor chert cemented by optically continuous rims of quartz and finer grained granoblastic quartz and trace biotite, sericite and hematite.

77120126 Pebbly limonitic quartz sandstone (Mundogie Sandstone, Elu) (1)
Very poorly sorted, coarse to pebbly, well rounded grains of quartz and minor chert cemented by optically continuous quartz and limonite. Original grain boundaries marked by a ring of fine granules of limonite? Chert grains contain limonite pseudomorphs after carbonate? (rhombohedra) - probably silicified dolomite.

77120127 Arkose (Wildman Siltstone, Elsw) (5)
Medium to coarse grained, poorly sorted, angular grains of quartz, alkali feldspar and plagioclase and trace secondary dark brown biotite, sericite and opaques.

77120128 Ferruginous siltstone with chert nodules (Koolpin Formation, Elk) (14)
Rounded nodules (2 cm) of fine grained granoblastic quartz containing carbonate rhomb moulds in a ferruginous quartz matrix.

77120129 Chert (Koolpin Formation, Elk) (15)
Patchy mosaic of fine to coarse grained granoblastic quartz, minor foliated sericite.

77120130 Chert (possibly tuffaceous) (Koolpin Formation, Elk) (14)
Very fine grained quartz and sericite containing rare splinters of quartz; quartz veins. Same as 77120131, 77120133.

77120131 Chert (possibly tuffaceous) (Koolpin Formation, Elk) (14)
Same as 77120130, 77120133.

77120132 Chert (Koolpin Formation, Elk) (15)
Fine grained granoblastic quartz, minor sericite and trace tourmaline (euhedral prisms).

77129133 Chert (possibly tuffaceous) (Koolpin Formation, Elk) (14)
Same as 77120130, 77120131. Laminated to very thinly bedded.

77120134 Sandstone hornfels (Fisher Creek Siltstone, Elf?) (11)

77120135 Pelitic hornfels? (Fisher Creek Siltstone?, Elf) (11)
Ferruginous fine grained granoblastic quartz and brown chlorite similar to 77120037.

77120136 Granophyre (Zamu Dolerite, Pdi) (11)
Coarse grained allotriomorphic quartz, alkali feldspar and sericite (after feldspar); relict graphic intergrowth texture.

77120137 Altered intermediate to basic volcanic (Shovel Billabong Andesite, Pvb) (12)
Very fine grained (<1 mm) sericitised plagioclase laths and microlites with interstitial allotriomorphic alkali feldspar? and minor quartz. Clouded by sericitic alteration and very fine grained opaques. Possibly related to Variolite.

77120138 Granophyre (Zamu Dolerite, Pdi) (11)
Description as for 77120026.

77120139 Granophyre (Zamu Dolerite, Pdi) (11)
Description as for 77120026.

77120140 Granophyre (Zamu Dolerite, Pdi) (11)
Description as for 77120026.

77120141 Limonitic quartz sandstone (Masson Formation, Plm) (15)

77120142 Cordierite biotite hornfels Masson Formation, Plm) (13)
Porphyroblasts (<1 mm) of cordierite rosettes? with minor muscovite in fine grained granoblastic biotite and quartz.

77120143 Variolite (Shovel Billabong Andesite, Pvb) (11)
Same as 77120018.

77120144 Chert (silicified dolomite?) (Koolpin Formation, Plk) (15)
Very fine granoblastic quartz and chlorite containing wavy bands of fine grained fibrous chlorite (probably bedding).

77120145 Medium even-grained granite (Cullen Granite, Pgc) (13)
Subidiomorphic microcline, sericitised sodic plagioclase, anhedral quartz minor biotite. Accessory minerals include muscovite, epidote?, zircon and opaques.

77120146 White coarse porphyritic granite (Cullen Granite, Pgc) (13)
Similar to 77120148. Phenocrysts are white microcline. Accessory minerals include sphene and dark greenish brown hornblende.

77120147 Medium even-grained granite (Cullen Granite, Pgc) (13)
Similar to 77120145, but leucocratic.

77120148 Pink coarse porphyritic granite (Cullen Granite Pgc) (13)
Massive porphyritic rock, phenocrysts (< 3 cm) of pink perthitic subidiomorphic potassium feldspar, commonly containing subhedral inclusions of sodic plagioclase. Groundmass (< 1 cm) consists of anhedral quartz, potassium feldspar and sodic plagioclase (sericitised). Accessory minerals include strongly pleochroic brown biotite, apatite, zircon and opaques.

77120149 Aplite (Cullen Granite, Pgc) (13)
Similar to 77120150. Fine even-grained anhedral quartz, microcline, orthoclase, and sericitised plagioclase; trace biotite.

77120150 Aplite (Cullen Granite, Pgc) (13)
Fine grained anhedral quartz, microcline, sericitised alkali feldspar, and sodic plagioclase; minor graphic intergrowths of quartz and alkali feldspar. Accessory biotite, epidote, muscovite, and opaques.

77120151 Ferruginous phyllite (Koolpin Formation, Plk) (2)
Foliated fine grained sericite and Fe oxides with minor angular silt-sized quartz grains. Sericite forms coarser grained Fe-oxide-poor patches that have been streaked out parallel to the foliation.

77120152 Limonitic silicified carbonate? (Koolpin Formation, Plk) (14)
Fine grained granoblastic quartz and coarser grained granuloblastic quartz (recrystallised and cavity filling crystals) minor sericite and carbonate in quartz. Limonite (replacement?) is granular and interstitial between quartz crystals - rare carbonate rhombohedra pseudomorphs.

77120153 Silicified dolomite (Masson Formation, Plm) (15)
Fine grained mosaic of granoblastic quartz veined by coarse grained quartz. Opaque mineral in concentric patterns defines a replacement texture.

77120154 Basalt (hawaiite) (Stag Creek Volcanics, Plv) (9)
Fine grained (<0.1 mm) interlocking plagioclase microlites (andesine?) with interstitial colourless to pale brown augite minor quartz (K feldspar?) and, sericite. Chlorite alteration. Granular epidote, sphene and opaques.

77120155 Chloritic phyllite (meta-tuffaceous shale) (Stag Creek Volcanics, Plv) (7)
Fine grained foliated dark green chlorite with scattered granular quartz, opaques and sphene.

77120156 Meta-basic volcanic (Stag Creek Volcanics, Plv) (7)
Fine grained xenoblastic sodic plagioclase and quartz, pale green nematoblastic amphibole (actinolite), minor dark green chlorite and scattered sphene opaques and idioblastic epidote.

77120157 Altered basic volcanic (Stag Creek Volcanics, Plv) (11)
Slightly porphyritic texture; sodic feldspar microlites and subhedral colourless epidote (after clinopyroxene?), interstitial altered glass (chlorite), rare subhedral phenocrysts of sodic plagioclase (<1 mm) and altered clinopyroxene?, small "vesicles" infilled by dark green chlorite (anomalous blue) and radiating colourless epidote crystals.

77120158 Altered volcarenite (Stag Creek Volcanics, Plv) (11)
Completely altered fine grained mosaic of chlorite, quartz and opaques - showing ghost subangular to subrounded grains of volcanic rock (relict feldspar microlites).

77120159 Olivine dolerite (Pdc) (8)
Medium grained, ophitic fabric, subidiomorphic crystals of pale brown augite (2 mm) enclose finer grained (< 1 mm) idiomorphic plagioclase crystals. Olivine occurs as rounded colourless fractured crystals or in polygonal aggregates, and is commonly partly pseudomorphed by dark green chlorite and opaques. Accessory minerals include interstitial pale greenish brown biotite, irregular opaque grains, acicular apatite, interstitial alkali feldspar, and rarely graphic intergrowths of alkali feldspar and quartz. Identical to olivine dolerite of Oenpelli Dolerite and Zamu Dolerite.

77120160 Pyritic carbonaceous shale (Koolpin Formation, Elk) (11)
Fine grained foliated sericite, quartz, and carbonaceous matter, containing lenses of pyrite.

77120161 Carbonaceous laminated dolomite (Koolpin Formation, Elk) (11)
Fine grained dolomite mosaic with thin laminae of carbonaceous matter, minor scattered quartz grains, and euhedral pyrite.

77120162 Banded iron formation (Koolpin Formation, Elk) (3)
Alternating laminae (< 1 cm) of fine grained dolomite, fine grained dolomite and hematite, and specular hematite (trace chlorite? in all bands) veined by quartz, dolomite, specular hematite and minor chlorite.

77120163 Ferruginous carbonaceous shale with chert nodules (Koolpin Formation, Elk) (3)
Rounded nodules of cryptocrystalline quartz mosaic containing ghost carbonate rhomb structures (i.e. probably silicified dolomite). Matrix consists of carbonaceous matter, limonite and small lenses, and angular patches of cryptocrystalline quartz.

77120165 Silicified tuffaceous siltstone with chert nodules (Koolpin Formation, Elk) (11)
Rounded nodules of cryptocrystalline quartz mosaic in a finer grained matrix of cryptocrystalline quartz, chlorite? Opaques and angular sericitic rock (after feldspar), and quartz fragments. Rare monazite and ferruginous volcanic rock fragments (relict feldspar microlites).

77120166 Banded Iron Formation (Koolpin Formation, Elk (11)
Laminated (< 1 cm) cryptocrystalline quartz and sericite, with bands and irregular patches of fine grained hematite.

77120167 Ironstone (Koolpin Formation, Elk) (11)
Massive limonite with minor scattered irregular cryptocrystalline quartz patches.

77120168 Limonitic nodular silicified tuffaceous siltstone (Gerowie Tuff, Eva) (11)

Nodule and surrounding rock composed of angular to subrounded grains of quartz and sericitic quartz, in a matrix of fine grained quartz mosaic with scattered limonite grains. Relict eutaxitic texture in matrix? Edge of nodule is a limonite-rich band formed by weathering.

77120169 Calc-silicate hornfels (Masson Formation, Elm) (14)

Radiating clusters of colourless tremolite crystals, sodic plagioclase, quartz, alkali feldspar and carbonate. Relict well rounded grain boundaries (< 1 mm). Probably hornfelsed calcarenite.

76120170 Silicified ferruginous siltstone with chert nodules (Koolpin Formation, Elk) (15)

Rounded nodules of fine grained granoblastic quartz in a matrix of cryptocrystalline quartz, hematite and limonite. Veins and irregular patches of coarse grained quartz.

76120171 Ferruginous shale (Koolpin Formation, Elk) (11)

Fine-grained sericite and minor cryptocrystalline quartz. Limonite staining along fractures and laminations.

77120172 Banded Iron Formation (Koolpin Formation, Elk) (15)

Alternating thin beds (< 2 cm) of laminated limonite and fine grained granoblastic quartz. Fractures infilled by specular hematite.

77120173 Ferruginous siltstone with chert nodules (Koolpin Formation, Elk) (15)

Rounded nodules of fine grained granoblastic quartz in a laminated matrix of limonite and quartz.

APPENDIX 2. DRILL-CORE DESCRIPTIONS

MU 1 (Chip samples only) Comp. Sheet 7. On a traverse designed to locate contact between Koolpin Formation and Mundogie Sandstone and investigate stratigraphy.

0 - 10'	Quartz, laterite, abundant white limestone
10 - 20'	Very abundant limestone, weathered and crumbly
20 - 30'	Weathered limestone, laterite, brown siltstone and grey phyllite, minor quartz
30 - 32'	Mainly weathered brown to yellow siltstone at top with rare phyllite. Minor quartz and quartzite.. Abundant fresh dark grey limestone 37-38'. Hole abandoned due to loss of circulation.

(Koolpin Formation)

MU2 Comp. Sheet 7. As for MU 1

78 - 83'3" Grey-green to purplish-brown phyllite with thin fine dark bands, 78' - 81', and fine quartz bands from 81' - 83'3". Banding sinuously contorted, minor pyrite; dip 65 - 70°.

(Wildman Siltstone)

MU 3 Comp. Sheet 7. As for MU 1

122'0" - 126'10" Light grey phyllite with very thin dark-grey bands; quartz and carbonate veining; banding slightly sinuous; small-scale faulting; minor pyrite; dip 85 - 90°.

(Wildman Siltstone)

MU 4 Comp. Sheet 1. As for MU 1

98' - 101'4" Phyllite and greywacke bands $\leq$ 2 cm. Greywacke bands are angular poorly sorted plagioclase, commonly altered and sericitized, quartz, alkali feldspar, and lithic fragments composed of fine grained sericite and quartz, very fine grained carbonaceous opaques; average grain size 0.5 mm. Dip 45°.

(Wildman Siltstone)

MU 5 — Comp. Sheet 1. As for MU 1

72' - 77' — Dark grey phyllite with thin lighter grey bands; fine quartz and calcite veining; minor pyrite; dip 60°.
(Wildman Siltstone)

MU 6 — Comp. Sheet 3. On a traverse designed to test electrical responses and investigate bedrock lithologies below Buffalo Creek plain.

94 - 96'5" — Thinly interbedded dark grey pyritic phyllite and greenish-grey pyritic quartz greywacke; quartz veined; extremely fractured. dip 45° to 80° at bottom.

112' - 117' — Pyritic arkose; quartz-pyrite veins, cleavage 45°.
(Wildman Siltstone)

MU 7 — Comp. Sheet 3. As for MU 6

108' - 113' — Finely-banded, dark-grey phyllite with interbedded lithic quartz greywacke showing graded bedding in one bed; thinly bedded; dip 20°.
(Wildman Siltstone)

MU 8 — Comp. Sheet 3. As for MU 6.

75' - 79' — Thinly interbedded phyllite and lithic quartz greywacke; dip 5°.
(Wildman Siltstone)

MU 9 — Comp. Sheet 3. As for MU 6.

78' - 82' — Dark grey phyllite with light grey bands and very thin interbeds of greywacke; dip 20°, cleavage 40°.
(Wildman Siltstone)

MU 10 — Comp. Sheet 3. As for MU 6.

85' - 90' — Thinly interbedded grey phyllite and fine to medium grained lithic quartz greywacke with shale clasts, showing graded bedding; dip 20°.
(Wildman Siltstone)

MU 11 — Comp. Sheet 3. As for MU 6.

116' - 121' — Thinly interbedded dark grey phyllite and medium grained greywacke; intensely fractured in places; dip 40° to 70° at bottom.

(Wildman Siltstone)

MU 12 — Comp. Sheet 3. As for MU 6.

145' - 149' — Thinly interbedded dark-grey banded phyllite and greywacke; dip 45°.

(Wildman Siltstone)

MU 13 — Comp. Sheet 3. As for MU 6.

142' - 142'7" — Crumbly black carbonaceous phyllite with fine quartz veining along cleavage planes (65°).

(Koolpin Formation) refer Appendix 1, 77120162, 77120163.

MU 14 — Comp. Sheet 3. As for MU 6.

75' - 78' — Grey banded phyllite with minor pyrite; cleavage parallel to bedding, 30° dip.

(Koolpin Formation)

MU 15 — Comp. Sheet 13. To obtain fresh granite for density measurement.

10' - 16' — Very coarse grained granite containing 40% pink orthoclase, 35% quartz, 20% green plagioclase, 5% biotite.

(Cullen Granite)

MU 16 — Comp. Sheet 14. To test for possible subsurface extension of an outcrop of silicified carbonate breccia.

32' - 34'2" — Fractured dark grey chert; dip 45°.

58' - 61'3" — Black carbonaceous shale; minor pyrite; cleavages dip 65°, 10°.

(Masson Formation)

MU 17 — Comp. Sheet 9. To investigate source of NW-trending linear magnetic anomaly.

68' - 98' — Grey splintery siliceous shale with carbonate in fractures to 86'7"; interbedded siltstone and greywacke, beds ≤5 cm; minor gradational bedding; very thin quartz and calcite veining throughout; at 97'9", dark grey fine grained calcareous greywacke; dip 30°.
(Masson Formation, magnetic source rock not intersected)

MU 18 — Comp. Sheet 14. As for MU 16.

120 ' - 123' — Dark grey pyritic carbonaceous shale; disseminated pyrite in bands; dip 20°.
(Masson Formation)

MU 19 — Comp. Sheet 11. To investigate source of northwest-trending magnetic anomaly.

59' - 60'10" — Altered fine-grained granophyre.
(Zamu Dolerite)

MU 20 — Comp. Sheet 11. To obtain fresh parent rock below ferruginous chert-banded and nodular siltstone of Koolpin Formation.

45' - 48' — Highly fractured purple-brown siltstone; quartz veined.

81' - 85' — Very fractured and weathered pink phyllite and ferruginous siltstone with lighter coloured fine grained quartz-rich bands; small veinlets of quartz-mica and calcite.
(Koolpin Formation: fresh parent rock not intersected)
(hole abandoned owing to slow progress)

MU 21 — Comp. Sheet 6. To test electrical responses and investigate bedrock lithologies below Buffalo Creek plain.

120' - 122'7" — Banded grey silty phyllitic shale; bedding parallel to cleavage, 45°.
(Wildman Siltstone)

MU 22	Comp. Sheet 6. As for MU 21.
105' - 106'7"	Quartz breccia with pyritic carbonaceous matrix. (Koolpin Formation)
MU 23	Comp. Sheet 6. As for MU 21.
130' - 133'	Fine to coarse grained lithic quartz greywacke; ½" band of graphitic phyllite at 132'4", dip 75°; 133' - a 2" quartz-carbonate vein; cleavage at 130' dips 70° and contains graphitic smear. (Wildman Siltstone)
MU 24	Comp. Sheet 6. As for MU 21.
90" - 93'6"	Dark grey to black banded carbonaceous phyllite; cleavage and bedding ranges from 55° to 45° at bottom. (Wildman Siltstone)
MU 25	Comp. Sheet 6. As for MU 21.
145' - 150'	Fine to medium grained thinly bedded sandstone with narrow interbeds of thinly bedded pale grey phyllitic siltstone; bedding parallel to cleavage, 50°. (Wildman Siltstone)
MU 26	Comp. Sheet 7. As for MU 21.
147' - 149'2"	Pale green sericitic phyllite; dip 45°. (Wildman Siltstone)
MU 27	Comp. Sheet 6. As for MU 21.
120' - 125'	Pale grey banded phyllite; bedding parallel to cleavage, 15°. (Wildman Siltstone)
MU 28	Comp. Sheet 6. As for MU 21.
120' - 124'10"	Pale to dark grey banded phyllite; quartz veined; bedding dips 10°, cleavage dips 30°. (Wildman Siltstone)

MU 29

90' - 93'11"

Comp. Sheet 6. As for MU 21.

Thinly interbedded banded dark grey phyllite and fine to medium grained lithic quartz greywacke, beds up to 6" thick; scour and fill marks at 91'; dip ranges from 40^{o} at top to 20^{o} at bottom.

(Wildman Siltstone)

MU 30

26' - 30'6"

Comp. Sheet 6. As for MU 21.

Fine to medium grained light grey quartzite; dip 12^{o}, cleavage 70^{o}.

(Wildman Siltstone?)

MU 31

135' - 139'10"

Comp. Sheet 2. As for MU 21.

Dark grey carbonaceous phyllite with numerous convoluted small quartz (?silicified carbonate) veins, $\leqslant$0.3 cm, streaks and blebs.

(Koolpin Formation)

MU 32

75' - 80'

Comp. Sheet 6. As for MU 21.

Dark-grey siltstone, carbonaceous

(Koolpin Formation?)

MU 33

54' - 58'

Comp. Sheet 6. As for MU 21.

Grey feldspathic quartzite; dip 20^{o}.

(Wildman Siltstone)

MU 34

Comp. Sheet 2. To test limonitic rock at depth.

No core: cuttings 70-80', siltstone and phyllite.

Hole abandoned due to loss of circulation in cavernous ground.

(Koolpin Formation - ferruginous capping over interbedded limestone and siltstone?).

MU 35

105' - 110'

Comp. Sheet 7. As for MU 21.

Banded light to dark grey (possibly carbonaceous) phyllite; 109'-110', quartz-mica-lithic arenite, quartz veined; bedding parallel to cleavage, dip 20°.

(Wildman Siltstone)

MU 36

60' - 61'1"

Comp. Sheet 7. As for MU 21.

Fine to medium grained quartzite, grey with darker grey bands $\leqslant$ 0.5 cm, dip 20°; cleavage 45°.

(Wildman Siltstone)

MU 37

107'6" - 110'

Comp. Sheet 7. To determine source of magnetic and gravity patterns on west margin of Barramundie Creek plains.

Grey to greenish-grey tuffaceous phyllite with off-white silty carbonate bands $\leqslant$2 cm; dip 45°.

(Stag Creek Volcanics) refer Appendix 1, 77120155.

MU 38

61' - 62'

Comp. Sheet 7. As for MU 37.

Fine-grained, greenish-grey spotted meta-volcanic XRD - chlorite, albite (An ~ 4), tremolite, clinopyroxene (aegerine-augite), ?forsterite, no quartz detected) dip of foliation 40°, and light grey fine grained quartzite.

(Stag Creek Volcanics) refer Appendix 1, 77120156)

MU 39

45' - 46'

Comp. Sheet 7. As for MU 37.

Fine to medium grained off-white feldspathic quartzite; dip 50°.

(Mundogie Sandstone)

MU 40

Comp. Sheet 7. As for MU 37.

No core; quartzite chips, 0-20'.

(Mundogie Sandstone)

MU 41 — Comp. Sheet 7. As for MU 37.

61' - 63' — Pinkish-white medium grained feldspathic quartzite; foliation, 15°.

(Mundogie Sandstone)

MU 42 — Comp. Sheet 8. To obtain fresh sample of unexposed dolerite unit (Edc).

77' - 78'6" — Medium grained quartz dolerite.

(Unnamed dolerite, Ecd) refer Appendix 1, 77120159.

MU 43 — Comp. Sheet 7. As for MU 37.

No core; chips 90-114', carbonaceous shale, light grey chert, grey phyllite.

(Koolpin Formation)

MU 44 — Comp. Sheet 8. To identify source rock in highly conductive zone in Mount Range.

80' - 82' — Grey, highly pyritic, quartz-rich gneiss; foliation 40°.

(Wildman Siltstone)

MU 45 — Comp. Sheet 11. On a traverse designed to investigate stratigraphy immediately adjacent to the Mundogie Sandstone in the southern part of the Sheet area.

90' - 92' — Banded grey to light grey lutite; bands ≤3 mm; dip 70°.

(Masson Formation)

MU 46 — Comp. Sheet 11. As for MU 45.

70' - 71' — Greenish-grey, very fractured siliceous shale.

(Stag Creek Volcanics)

MU 47 — Comp. Sheet 11. As for MU 45.

61'9" - 62' — Banded dark-grey to light grey, bands 1.0 cm, lutite; dip 10°.

(Stag Creek Volcanics)

MU 48 — Comp. Sheet 11. As for MU 45.

61' - 63' — Fractured greenish-grey siliceous shale, possibly volcanic.
(Stag Creek Volcanics) refer Appendix 1, 77120157.

MU 49 — Comp. Sheet 11. As for MU 45.

92' - 94' — Speckled greenish-grey fine grained arenite with grey lutite bands $\leqslant 2$ mm; dip 70^{o}.
(Mundogie Sandstone) refer Appendix 1, 77120158.

MU 50 — Comp. Sheet 11. As for MU 45.

75' - 77'6" — Black carbonaceous shale with pyrite concretions; dip 10^{o}. X.R.D., quartz, muscovite, chlorite, gedrite or goldichite ($K\ Fe\ (SO_4)_2 .\ 4\ H_2O$), pyrite, no sphalerite or galena detected (limit of detection, 3%).
(Koolpin Formation) refer Appendix 1, 77120160.

MU 51 — Comp. Sheet 11. As for MU 45.

90' - 92' — Dark grey with lighter grey streaks, calcareous shale with minor calcite and pyrite veins; dip 70^{o}.
(Koolpin Formation) refer Appendix 1, 77120161.

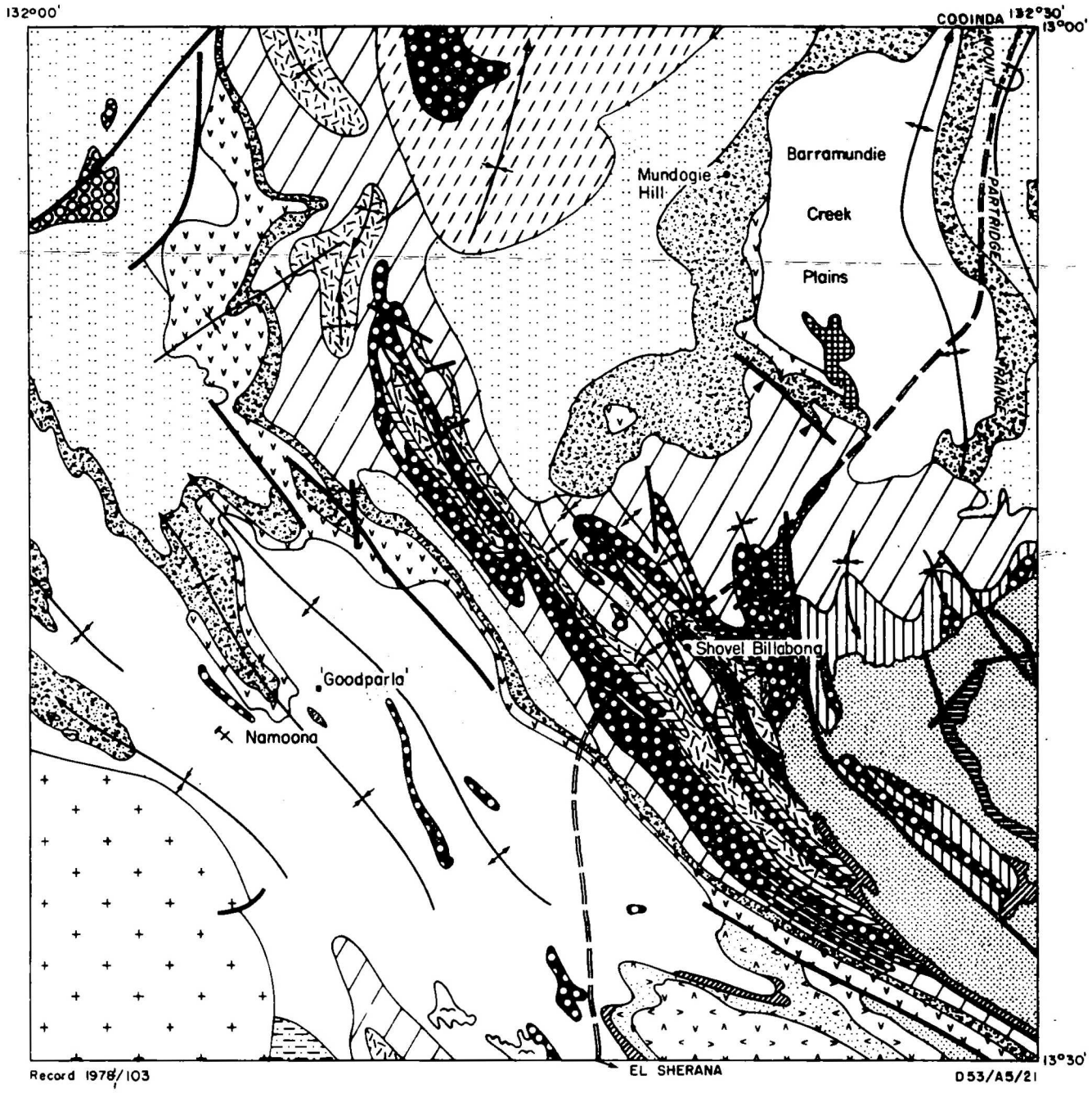
MU 52 — Comp. Sheet 11. As for MU 45.

90' - 92' — Banded light grey (<5 mm bands) to dark grey slightly coarser grained and micaceous ($\leqslant 2$ cm bands) shale; microfaulted and brecciated in places; dip 70^{o}.
(Masson Formation?).

MU 53 — Comp. Sheet 11. As for MU 45.

65' - 67' — Banded light grey to dark grey ($\leqslant 5$ cm) shale; dip 5^{o} at top, 70^{o} at bottom.
(Masson Formation?)

Printed by C. J. Thompson, Commonwealth Government Printer, Canberra



Cretaceous

Kombolgie Formation *sandstone*

Plum Tree Creek Volcanic Member

Kurrundie Member

Edith River Volcanics

dolerite

Oenpelli Dolerite

Cullen Granite

ϵd_1 Zamu Dolerite

ϵl_b Burrell Creek Siltstone

ϵl_f Fisher Creek Siltstone

ϵv_b Shovel Billabong Andesite

ϵv_a Gerowie Tuff

$\epsilon l k_2$, $\epsilon l k_1$ Koolpin Formation

ϵl_{sw} Wildman Siltstone

ϵl_u Mundogie Sandstone

ϵl_h Mount Hooper Sandstone

ϵl_v Stag Creek Volcanics

ϵl_m Masson Formation

Geological boundary

Fault

Reverse fault

Anticline, showing plunge

Syncline, showing plunge

Overturned syncline

Prospect

0 10 km

46

Fig. 1 Mundogie 1:100 000 Sheet area, interpreted solid geology

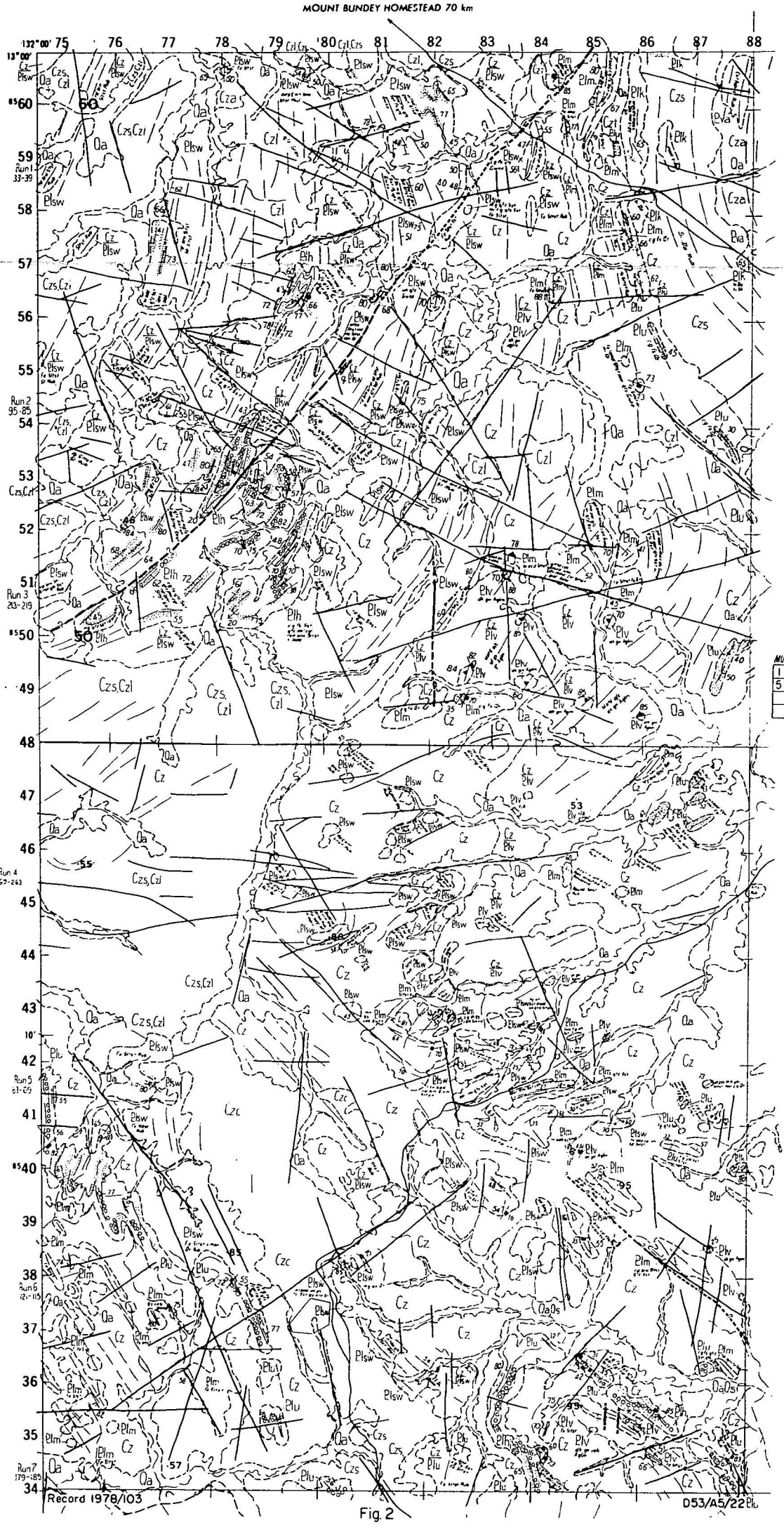

MOUNT BUNDEY HOMESTEAD 70 km
MUNDOGIE
Record 1978/103
D53/A5/22

Fig. 2

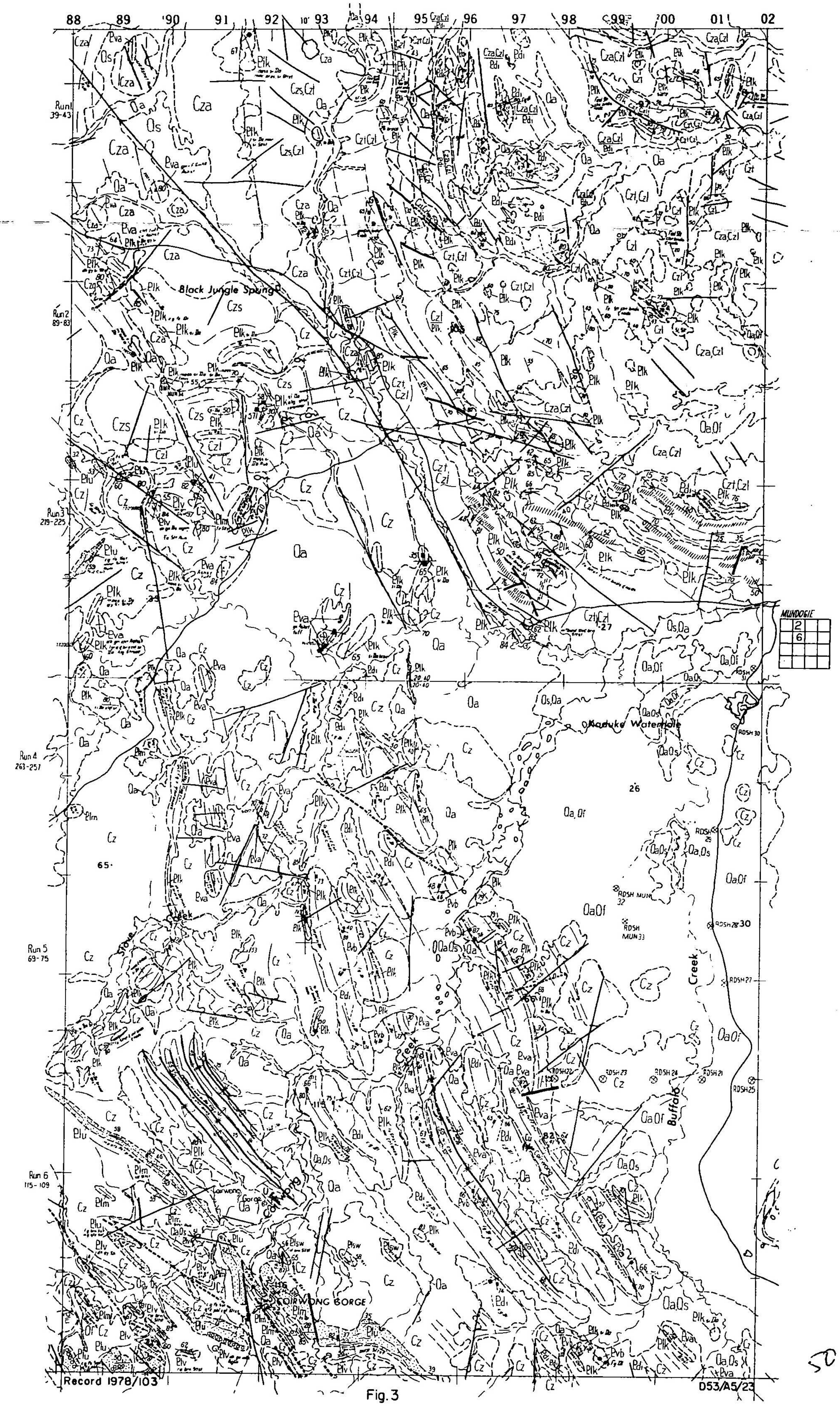
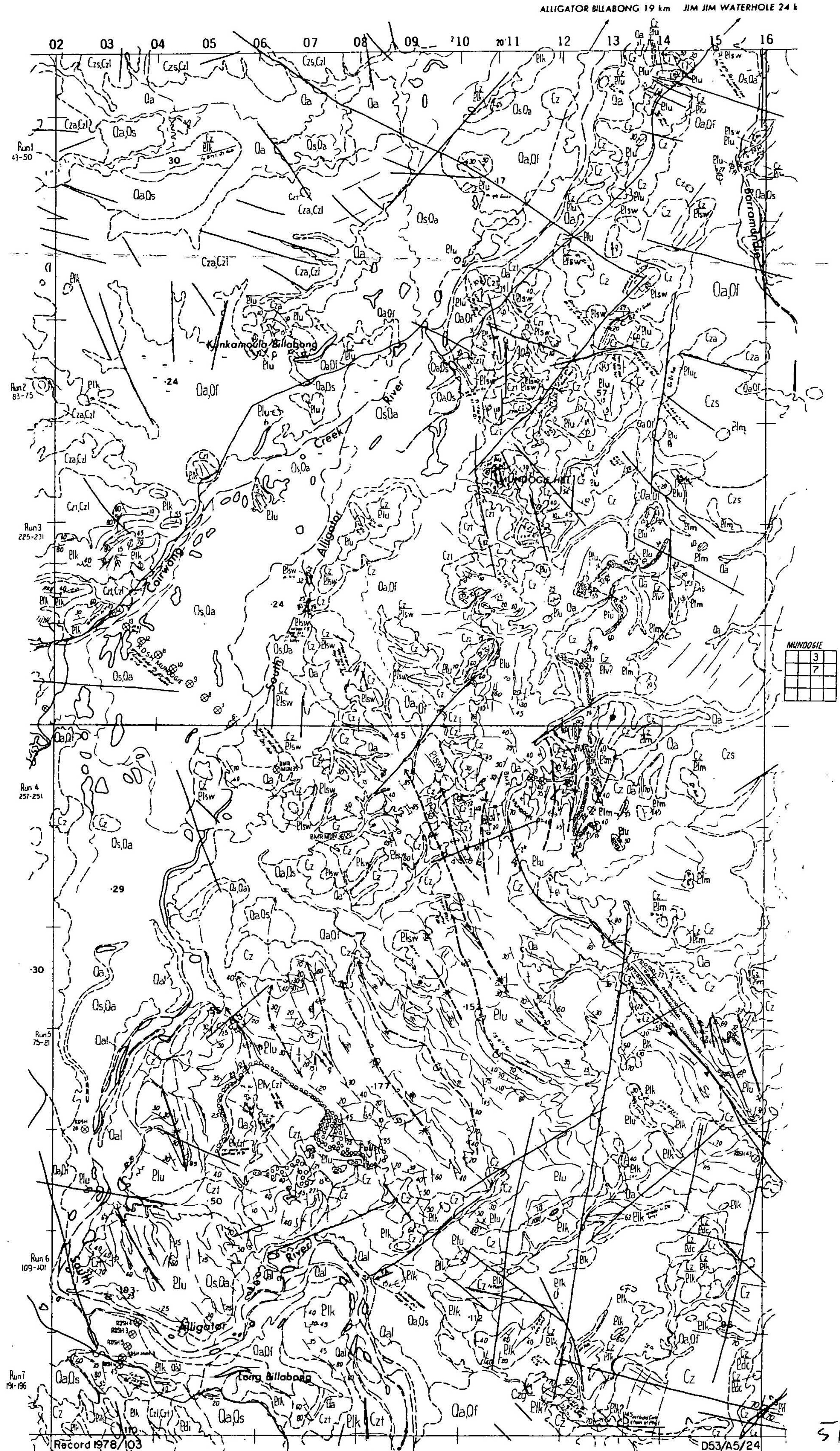

88
89
90
91
92
93
94
95
96
97
98
99
00
01
02
Run 1 39-43
Run 2 89-83
Run 3 219-225
Run 4 263-257
Run 5 69-75
Run 6 115-109
Black Jungle Spring
Kaduke Waterhole
Buffalo Creek
MUNDOGIE
Record 1978/103
D53/A5/23

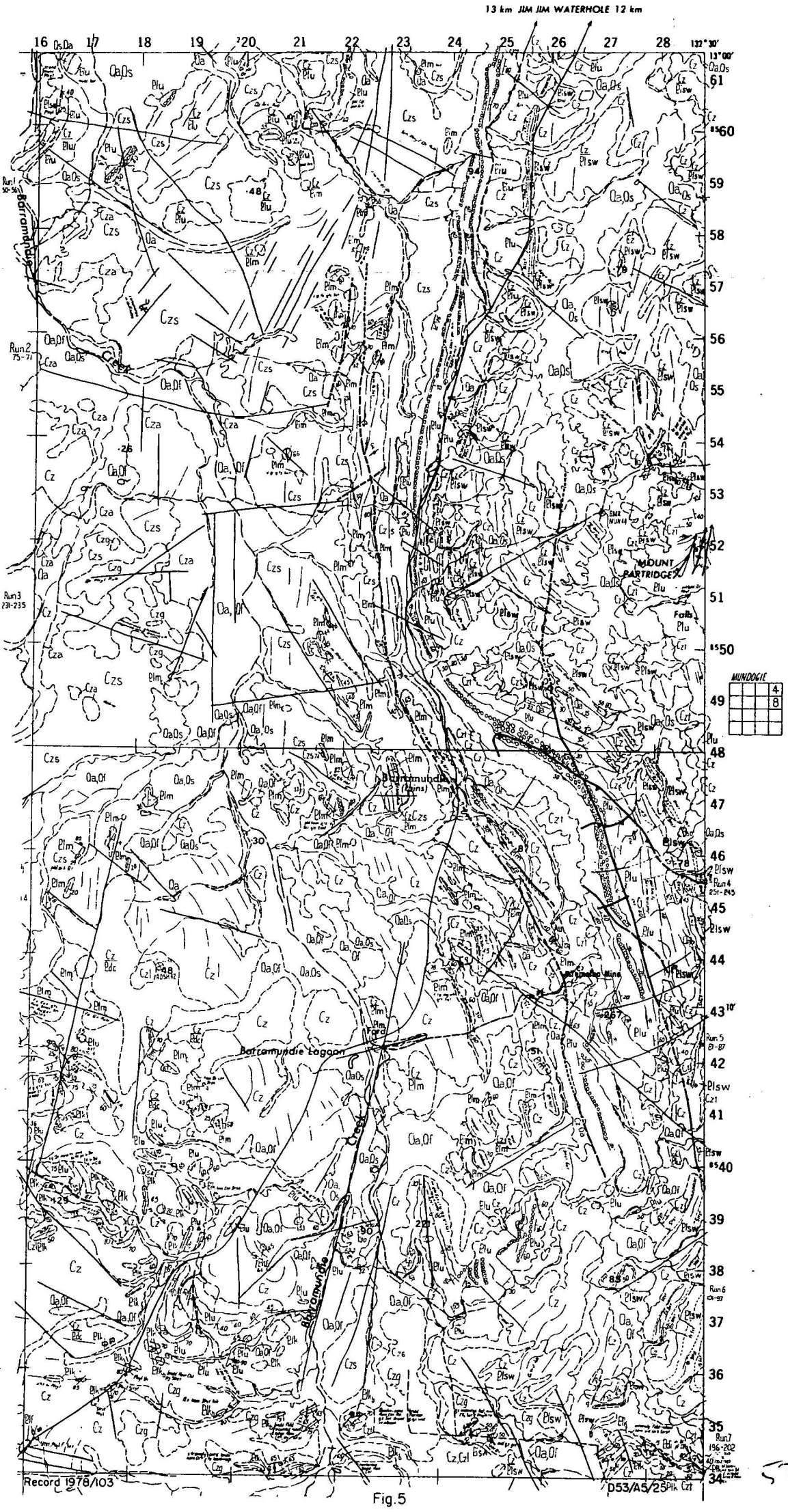
Fig. 3

50



ALLIGATOR BILLABONG 19 km
JIM JIM WATERHOLE 24 k
02
03
04
05
06
07
08
09
10
11
12
13
14
15
16
Run 1 43-50
Run 2 83-75
Run 3 225-231
Run 4 257-251
Run 5 75-81
Run 6 109-101
Run 7 191-196
Creek
River
Alligator
South
MUNDOGIE HILL
MUNDOGIE
Long Billabong
Record 1978/103
D53/A5/24

Fig. 4


13 km JIM JIM WATERHOLE 12 km
Barramundie
Run1 50-56
Run2 75-71
Run3 231-235
MOUNT PARTRIDGE
Falls
MUNDOGIE
Barramundie (Twins)
Barramundie Lagoon
Barramundie Creek
Run4 251-245
Run5 89-87
Run6
Run7 196-202
Record 1978/103
D53/A5/25
Fig.5

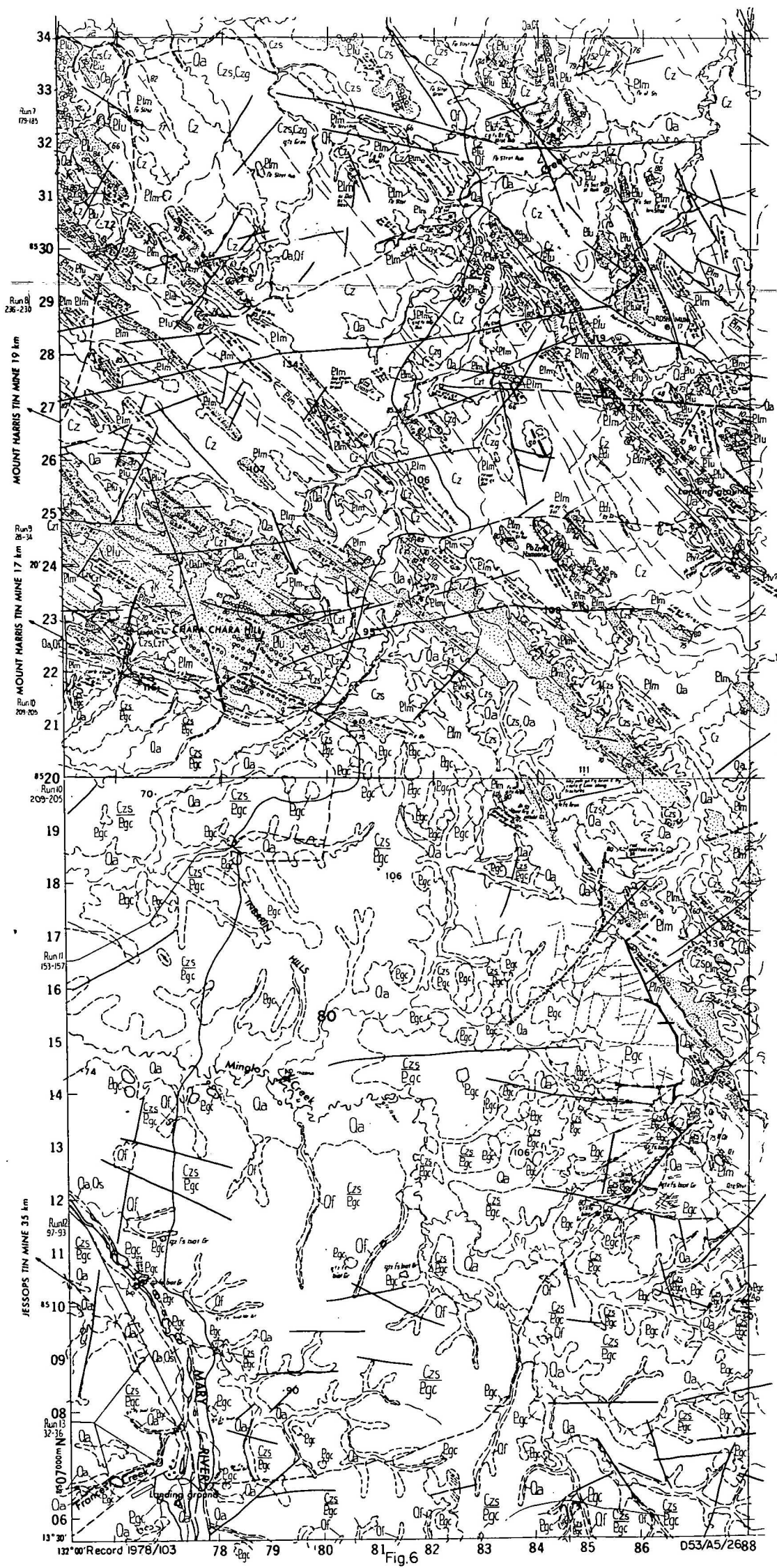
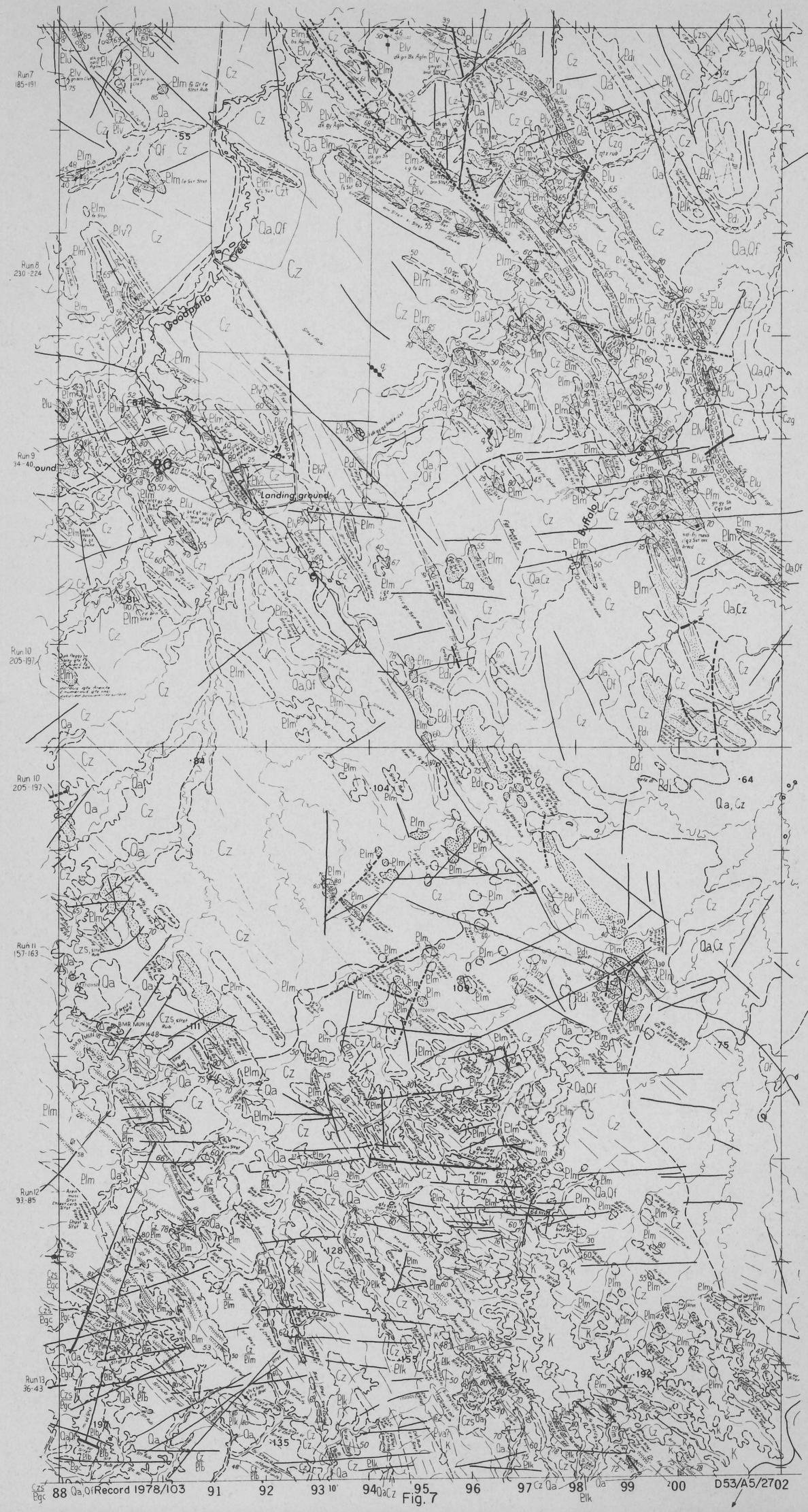

MOUNT HARRIS TIN MINE 19 km
MOUNT HARRIS TIN MINE 17 km
JESSOPS TIN MINE 35 km
CHARA CHARA HILL
Mingle Creek
MARY RIVER
Frontier Creek
Landing ground
MUNDOGIE
Record 1978/103
D53/A5/2688

Fig.6


Run7
185-191
Run8
230-224
Run9
34-40
Run10
205-197
Run10
205-197
Run11
157-163
Run12
93-85
Run13
36-43
Goodparla Creek
Landing ground
Buffalo Creek
Qa,Qf
Qa,Cz
Cz
Plm
Plv
Plu
Plk
Pdl
Czg
Czs
Egc
Qa
Qf
10
14
MUNDOGIE
NORTHERN HERCULES 29 km
88
91
92
93
94
95
96
97
98
99
00
Record 1978/103
Fig. 7
D53/A5/2702

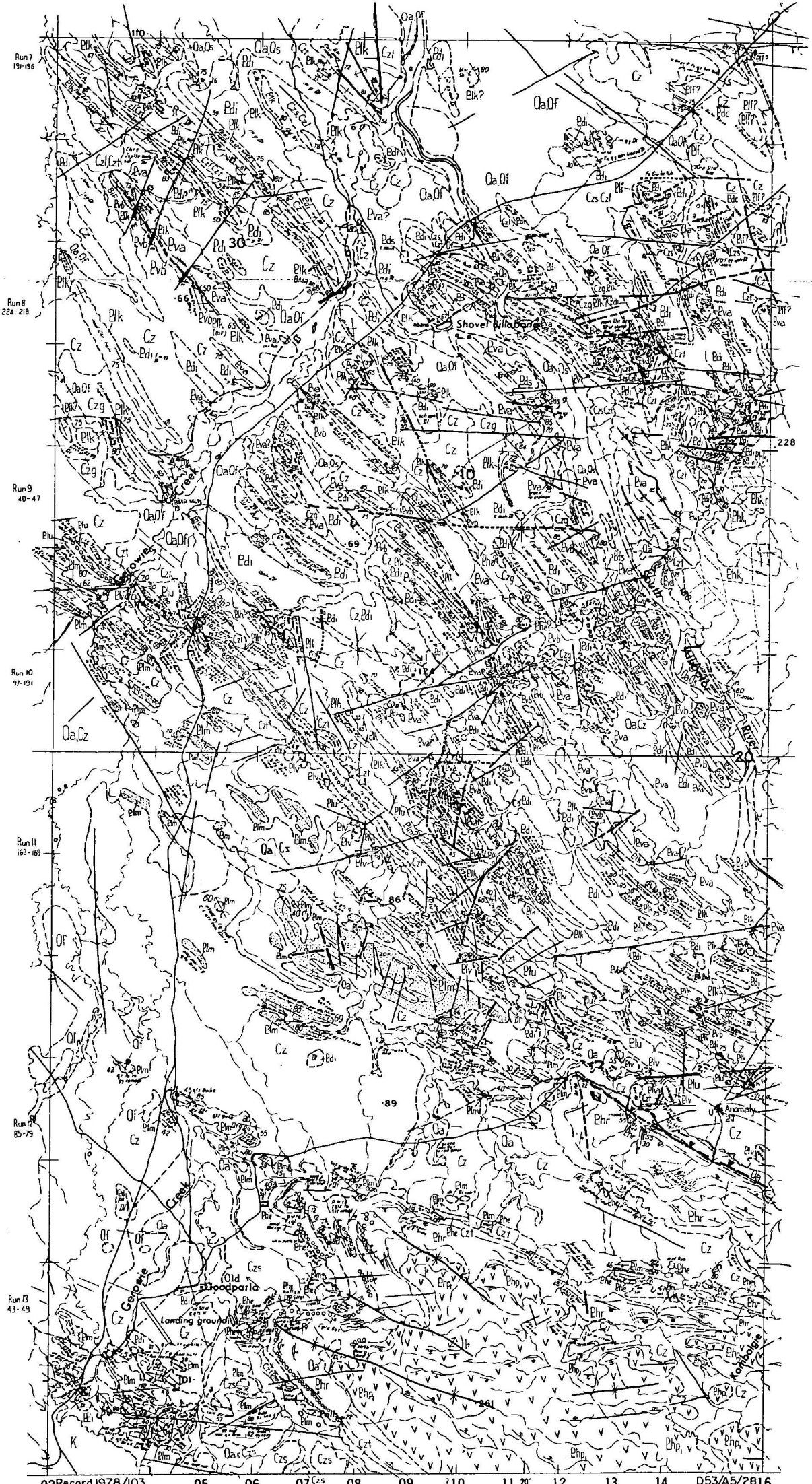
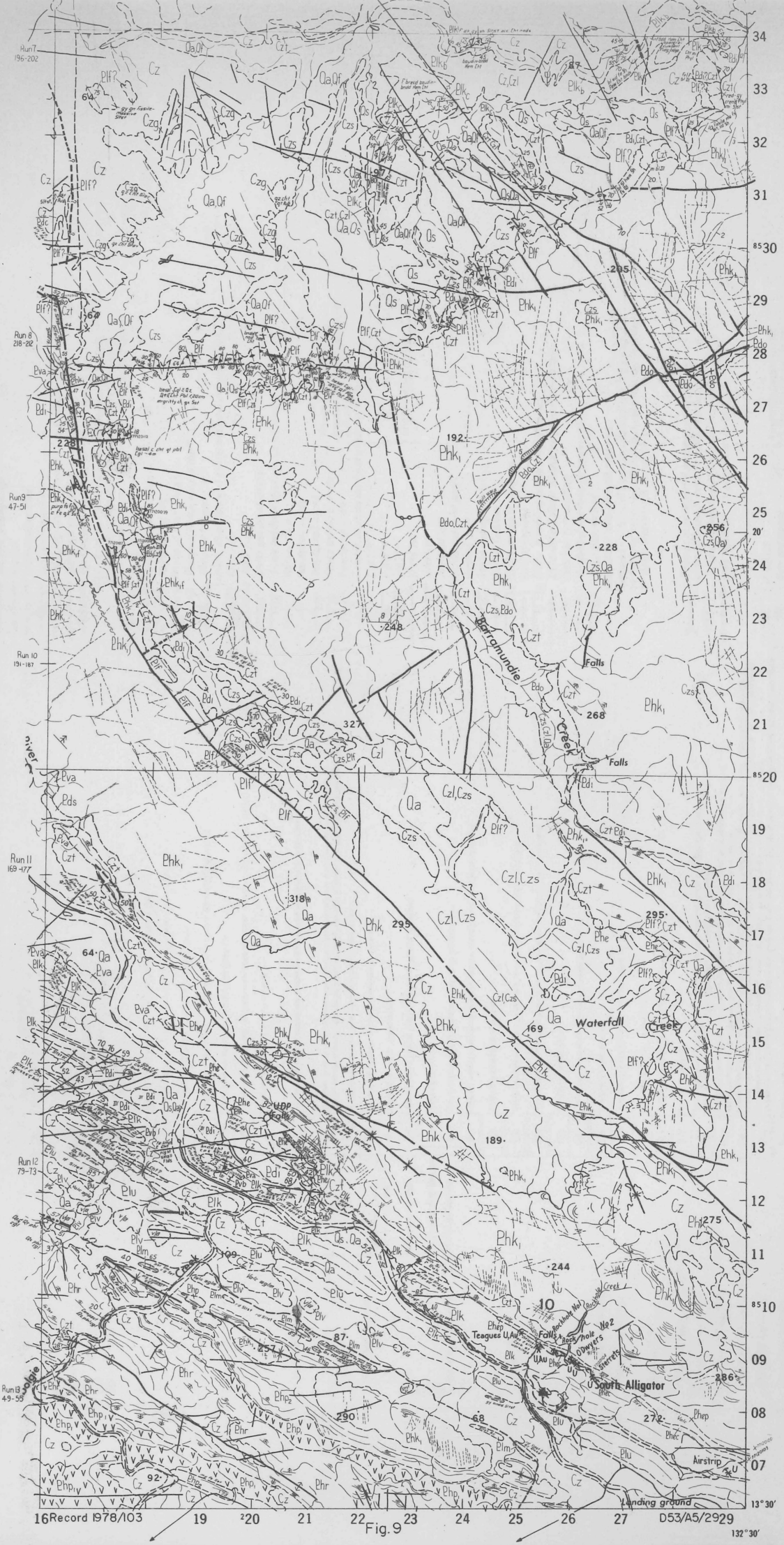

Run 7
191-196
Run 8
224-218
Run 9
40-47
Run 10
97-191
Run 11
163-169
Run 12
85-79
Run 13
43-49
Shovel Billabong
Old Woodparla
Landing ground
Gelgorie Creek
Lowes Creek
Kambalgie
Anomaly
MUNDOGIE
02 Record 1978/103
05
06
07
08
09
10
11
12
13
14
D53/A5/2816

Fig. 8



16 Record 1978/103 — Fig. 9 — D53/A5/2929

MUNDOGIE

1:100 000 compilation

Reference

132°00' 132°30' 13°00' 13°30'

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

INDEX TO PLATES

CAINOZOIC	QUATERNARY			Qa	Silt sand clay; alluvium
				Qf	Black and brown humic soil and clay deposits
				Qs	Unconsolidated sand; outwash and colluvial deposits
				Qal	Silt, clayey silt, sand; levée deposits
				Cz	Skeletal soils, gradational red soils and yellow-earth type soils
				Czt	Sandstone, quartzite and shale fragments, sand; rubble and talus
				Czg	Higher level gravels and gravelly skeletal soils
				Czc	Gravelly sand, alluvium and skeletal soil; higher level alluvial plains
				Cza	Winnowed sand, silt, clay; partially stripped Czs
				Czs	Unconsolidated sand, ferruginous and clayey sand; undissected Koolpinyah Surface
				Czl	Nodular and concretionary laterite
MESOZOIC	Mullaman Beds			K	Ferruginous coarse to medium friable sandstone and conglomerate with shale clasts
PRECAMBRIAN	CARPENTARIAN	Kombolgie Formation		$Phk_{1,2}$	Medium-coarse quartz sandstone, clayey or pebbly in places; basal conglomerate common; minor siltstone beds, rare basal breccia-conglomerate. Extensively ripple-marked cross-bedded
				Phk_f	Medium-coarse ferruginous porous quartz sandstone
			Plum Tree Creek Volcanic Member	Php_2	Medium clean quartz sandstone, feldspathic in places
				Php_1	Rhyolite, andesite, pyroclastics
			Kurrundie Member	Phr	Pebbly purple coarse greywacke, coarse quartz sandstone
		Edith River Volcanics	Pul Pul Rhyolite Member	Phep	Rhyolite, ignimbrite
			Coronation Member	Phec	Pebbly coarse quartz sandstone, commonly tuffaceous
				Phe	Rhyolite, dacite, minor basic volcanics; lenses of ignimbrite and tuffaceous sandstone
		Oenpelli Dolerite		Pdc	Medium grained quartz dolerite
				Pdo	Olivine dolerite commonly porphyritic; minor quartz dolerite and granophyre
		Cullen Granite		Pgc	Pink and grey porphyritic granite, minor medium even-grained granite and aplite
				Pds	Porphyritic lamprophyre
		Zamu Dolerite*		Pdi	Olivine dolerite, quartz dolerite, diorite and granophyre
	LOWER PROTEROZOIC	Burrell Creek Formation		Plb	Micaceous sandy siltstone
		Fisher Creek Siltstone		Plf	Siltstone, greywacke, slate, arkose, sandstone
		Gerowie Tuff*		Pvp	Fine-medium green pyroclastics
				Pva	Tuff, Argillite, pale green tuffaceous greywacke
		Shovel Billabong Andesite*		Pvb	Variolitic andesite
		Koolpin Formation		Plk	Ferruginous siltstone with chert bands, lenses and nodules, pyritic carbonaceous shale, silicified dolomite: minor phyllite, jasper and banded iron formation
		Wildman Siltstone*		Plsw	Siltstone, carbonaceous and pyritic at depth in places, red and cream laminated siltstone; minor quartzite, arkose, and quartz greywacke; phyllite and schist in Mount Partridge Range
		Mount Hooper Sandstone*		Plh	Medium quartz sandstone and quartzite with some chert fragments; siltstone, phyllite; feldspathic quartzite, pebbly in places; chert pebble conglomerate. Cross bedded; graded bedding and scour structures in places
		Mundogie Sandstone*		Plu	Coarse-medium quartz sandstone, commonly pebbly, quartz pebble conglomerate, siltstone; gneissic orthoquartzite and minor schist in Mount Partride Range. Pyritic in places. Cross bedded scoured and graded beds
		Stag Creek Volcanics		Plv	Basic volcanic breccia, hawaiite, tuff, tuffaceous shale, tuffaceous greywacke
		Masson Formation		Plm	Shale (probably mostly carbonaceous at depth), fine to coarse calcareous and volcanic quartz greywacke, calc-arenite, sandstone, limestone

*Name not yet approved

oooo Conglomerate ⁘⁘ Arenite //// Shale ΔΔ Breccia VV Volcanics |||| Gossan Subscript 'c' after unit symbols indicate bedrock obscured by thin regolith e.g. Plu_c

Geological boundary
Anticline, showing plunge
Syncline
Overturned anticline
Overturned syncline
Fault, hqb indicates hematitic quartz breccia
High angle reverse fault
Fault, showing relative horizontal movement
Where location of boundaries, folds and faults is approximate line is broken; where inferred, queried; where concealed, boundaries and folds are dotted, faults are shown by short dashes
10 Plunge of minor anticline
15 Plunge of minor syncline
5 Plunge of drag fold
B 30 Plunge of chert boudins
C 8 Plunge of contortions in chert
FA Plunge of fold axis
Symbols show bearing of plunge and value where measured
Fault zone
Shear zone
10 Strike and dip of strata
15 Strike and dip of strata facing not known
Vertical strata
Horizontal strata
Overturned strata
10 Strike and dip of strata
15 Overturned strata
8 Proved direction of facing based on sedimentary structures indicated by dot
Generalized strike and dip of undulating strata
17 Dip < 15°
Dip 15°-45°
Dip > 45°
Trend line
Lineament
Joint pattern
Air-photo interpretation
10 Strike and dip of joint
Vertical joint
15 Strike and dip of foliation
Vertical foliation
30 Strike and dip of cleavage
Vertical cleavage
7 5 Strike of bedding and cleavage coincident
Direction and plunge of lineation (mineral elongation)
Lineation (crenulation)
Horizontal lineation (crenulation)
10 Platy flow, inclined
Dips without values are not measured
Symbols for structural elements observed at a single point may be combined on the map, although to avoid repetition, they may be shown separately in the reference

Direction of movement of sediment bearing currents, sense unknown; X indicates cross stratification
X 77120092 Thin section locality with BMR reference number
Dyke, q quartz, qb quartz breccia, Ap aplite

Prospect
Mine abandoned
Alluvial workings abandoned
Au gold, Cu copper, Fe iron, Pb lead, U uranium, Zn zinc
Battery or treatment plant not operating
Costean or trench
BMR drill hole; RDSH rotary drill scout hole

Bore salinity < 2500ppm
Stream with waterfall
Waterhole
Swamp
Spring

Road
Vehicle track
Landing ground
Goodparla Homestead
Building
Fence
Yd Yard
.24 Elevation in metres