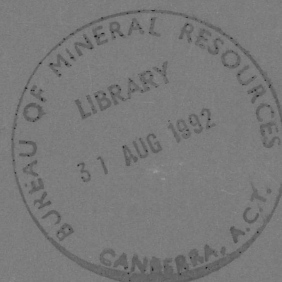


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# 1992 BMR RECORD

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BMR RECORD 1992/48

A REVIEW OF DEVONIAN BRACHIOPOD RECORD  
IN THE CANNING BASIN, WESTERN AUSTRALIA

by

D. L. STRUSZ

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Bureau of Mineral **R**esources,  
Geology and Geophysics

Record 1992/48

A REVIEW OF THE DEVONIAN BRACHIOPOD RECORD IN  
THE CANNING BASIN, WESTERN AUSTRALIA

by  
DESMOND L. STRUSZ



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## INTRODUCTION

While brachiopods from the Devonian of the Canning Basin were first described by Hosking (1933), the only monograph of the fauna is that of Veevers (1959), who also introduced a comprehensive zonation for the basin. Veevers had at his disposal the earlier collection of Teichert (1949), and the large collections made by the BMR and WAPET survey parties (see Guppy et al., 1958). The BMR survey also had the benefit of air photography taken in 1947. Most (but unfortunately not all) of Veevers' localities were marked on the air photos, which are still held by the palaeontological group of BMR. Veevers quoted air-photo coordinates for his and the WAPET localities, and I have found these very useful in cross-checking the marked points, where field and published numbering systems have diverged. In the process, I discovered several misprints in Veevers' published list.

As a recent BMR project to analyse the development of the Canning Basin progressed, it became apparent that any use of Veevers' brachiopod biostratigraphy was severely limited by uncertainty over the correct stratigraphic position of his localities, in terms of more recently published geological maps (especially Playford & Lowry, 1966). This report is an attempt to address that problem.

From all available information, but particularly the air-photos, I have plotted the localities quoted by Veevers onto the current 1:100,000 topographic sheets. Except in areas of little topographic expression this could be done with an accuracy equal to that of the map compilations. The results are presented in the first section of this report, in which I give as detailed as possible a description of the location of each published brachiopod locality. Coincidentally I have been compiling a catalogue of the BMR holdings of published corals. In the process of providing locality and stratigraphy details I found that there were frequently small discrepancies for the heights quoted for localities in measured sections by Hill & Jell (1970) on the one hand, and Veevers (1959) and Veevers & Wells (1961) on the other. I have no way to resolve this, and quote Veevers' figures herein.

I then compared Veevers' published stratigraphic information on the localities against the maps in Playford & Lowry (1966). These are at the same scale of 1:100,000, although with the old 10,000 yard grid. There were a few topographic discrepancies, but in general this was straightforward. Note was also taken, where possible, of more recent published geological maps (e.g. Druce & Radke, 1979). In making this comparison I found relatively few significant changes were needed, other than those resulting from actual changes in stratigraphic terminology. In the absence of additional biostratigraphic data, I could not generally go beyond the reassessment of the zonation made by Roberts *et al.* (1972). However, work on conodont faunas by Nicoll (1980) near a couple of key localities in the *Crurithyris apena* Zone has led me to establish with some confidence that that zone must extend into the early Famennian. This partly or completely closes the gap between it and the succeeding *Nyege scopimus* Zone shown by Roberts *et al.*, and is discussed in more detail below.

Several of the species described by Veevers have since been either fully revised, or at least placed in different genera. A few new taxa have also been described. I have brought the results together here in a single systematic list, as well as incorporating them in the various lists showing brachiopod distribution, and the table of zonal distribution.

**Acknowledgments.** This work has benefited greatly from discussion with Robert Nicoll and Peter Jones of BMR on matters of Canning Basin stratigraphy and geography. I am also grateful to J.M. Dickins for keeping most of Veevers' original air-photos safe. Bringing the brachiopod systematics up to date was helped by Rex Doescher of the Smithsonian Institution for a search print-out from his brachiopod database, and by information on recent papers provided by Howard Brunton and Robin Cocks of the Natural History Museum, London.

## BIOSTRATIGRAPHIC CONCLUSIONS

Roberts *et al.* (1972) showed quite clearly that the *Crurithyris apena* Zone lay not between the Givetian *Amphipora ramosa* Zone and the early Frasnian *Ladjia saltica* Zone, but later in the Frasnian, above the *Emanuella torrida* Zone. There may or may not be a gap between the *ramosa* and *saltica* Zones. Veevers listed quite a few of his localities as falling in either the *apena* or *saltica* Zones, on the assumption that they were in sequence. This is clearly no longer tenable. In nearly all of these cases, however, the localities were at the top or bottom of measured sections, so the alternative zonal overlap was obvious. Of the remaining localities in which there was a choice of zone, and which could be plotted with at least reasonable accuracy, only five, none of them Veevers', need further discussion. This is partly because they have been placed in the Napier Formation (or its synonyms), which is now considered to be basically of Famennian age (Nicoll, pers. comm. July 1992).

Teichert's Locality 9 (in his "Atrypa Limestone") was put in the Fossil Downs Formation by Veevers. The only brachiopod is *Flabellulirostrum wolmericum*, elsewhere known from the *saltica* and *torrida* Zones. The position is most likely to be within the Pillara Limestone on Playford & Lowry's map. On p. 26 Veevers makes a relevant comment: "... in many areas the Fossil Downs Formation is overlain conformably by the Fairfield Beds ...". If this superposition applies equally at locality T9, then Veevers' assignment is correct, as the Fossil Downs Formation has been subsumed in the Napier Formation, which is overlain by the Fairfield Group. However, that would imply that *F. wolmericum* extends beyond the *torrida* Zone, to the high *apena* Zone (see below) or even the *Nyege scopimus* Zone. This can only be resolved by additional collecting.

Locality Ld31 is the type locality of *Hypothyridina margarita*, and contains several other brachiopods - *Crurithyris apena*, *Pugnax* cf. *pugnax*, possibly *Desquamatia* (*Synatrypa*) *kimberleyensis*, and cf. *Schizophoria stainbrooki*. Veevers placed it in the Napier Formation, which is also where it falls on the Playford & Lowry map. It is low in the Napier Limestone, near a reef knoll of the Windjana Limestone. Work by Nicoll (1980) in the vicinity (section WCB308) clearly shows that the Napier Formation here is totally Famennian. Unpublished section WCB707 is on the flank of the same knoll as Ld31, and confirms that conclusion. Ld31 is clearly low in the formation. The *apena* Zone is essentially based on the presence of *C. apena* (Veevers, 1959, p. 15). The inescapable conclusion is that the *apena* Zone extends into the early Famennian, and so at least reduces the gap in brachiopod zonation shown in Roberts *et al.* (1972).

Around locality Ld33, on the opposite side of the Oscar Plateau from Ld31, the formation boundaries are closely spaced, and it could be Napier, Windjana, or even Pillara Limestone (in the sense of Playford & Lowry). Veevers placed it in the Oscar (now Napier) Formation, *apena* or *saltica* Zone. The only brachiopod is *Hypothyridina margarita*, definitely known from both zones. The stratigraphic position appears similar to that of Ld31, and I conclude that it is in the early Famennian part of the Napier Formation and the *apena* Zone.

Locality O/73 was placed in the Oscar Formation, *apena* or *saltica* Zone. It has a relatively extensive fauna, with *H. margarita*, *Nervostrophia bunapica*, *Desquamatia* (*Synatrypa*) *kimberleyensis*, *Pugnax* spp. cf. *pugnax* and *acuminatus*, and possibly *C. apena*. It is on strike with Ld33, within the Napier Formation. That, plus the fauna, makes it most likely that it belongs within the earliest Famennian part of the formation, within the *apena* Zone. This does mean that *N. bunapica* and *D. (S.) kimberleyensis* extend into the earliest Famennian.

Locality F33 was placed in the Napier Formation, *apena* or *saltica* Zone, but cannot be very accurately positioned. Nevertheless it is most likely to be in the Napier Formation. The brachiopods are *H. margarita* and *Parvulaltarostrum veeversi*. In view of the above discussion, I think it most likely to be low in the Napier Formation, in the Famennian part of the *apena* Zone.

The only remaining problem is that of the upper part of what had previously been mapped as Pillara Limestone. Roberts *et al.* (1972) showed that it was distinct from the lower part, which includes the type section of the formation. They referred to the upper part as "Pillara Ls". This has since been named the Nullara Limestone, but no published maps show the full extent of that unit. The nearest approach to that is the information published by Druce & Radke (1979). As noted by Nicoll (1980, p. 133), "The Nullara limestone thus probably corresponds roughly to the 'birdseye limestone' of Druce & Radke ...", which in turn roughly corresponds to the "Pillara Limestone". For those areas covered by the maps in Druce & Radke, localities can be appropriately assigned, despite some topographic and scale problems with those maps. I note any uncertainty under the individual localities.

# CANNING BASIN DEVONIAN BRACHIOPODA

## ZONAL DISTRIBUTION CHART

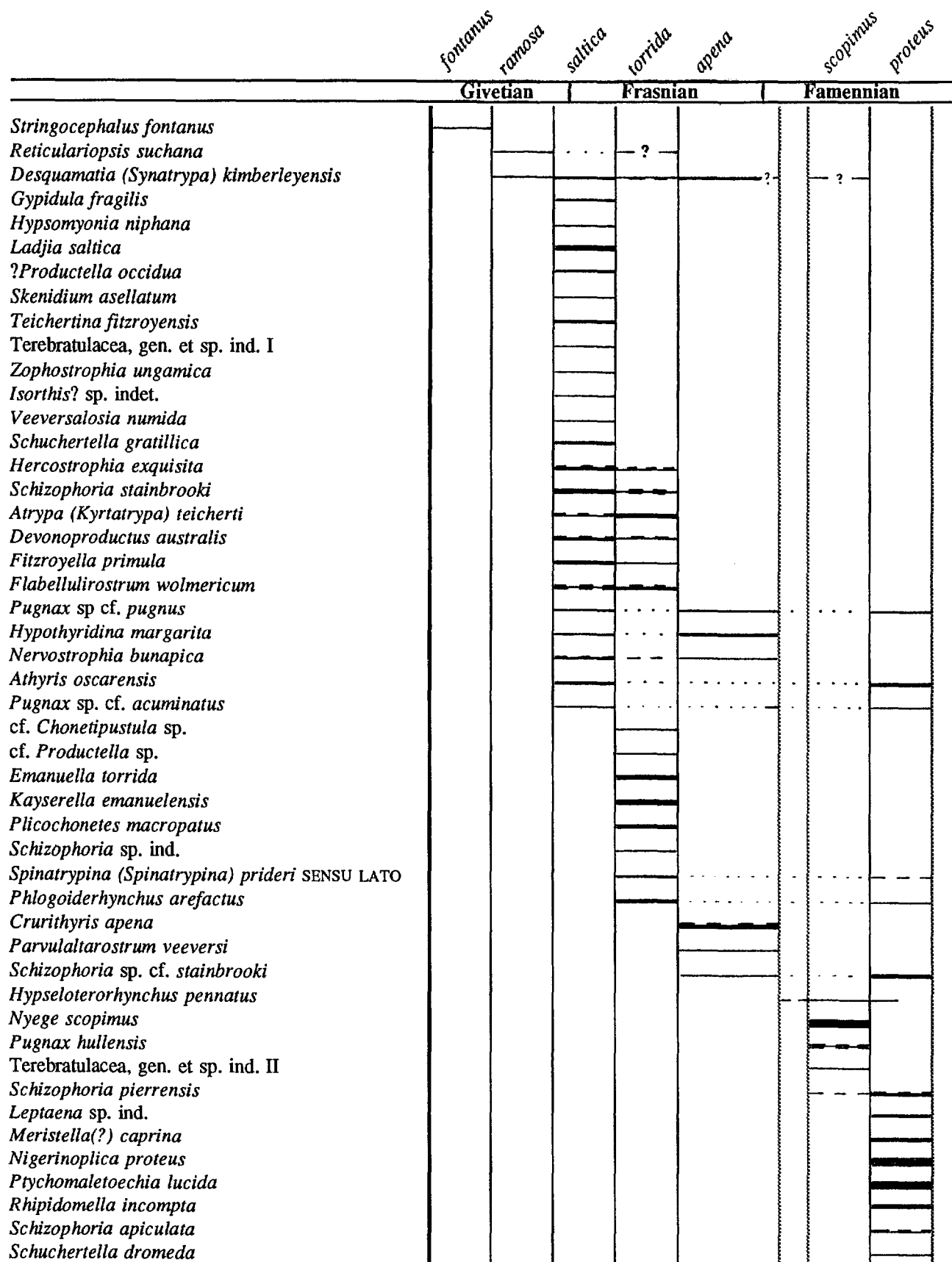


Table 1: Zonal distribution of brachiopods on the Lennard Shelf. Line weight is approximately proportional to number of localities. Dashed lines indicate uncertain occurrence, or (especially for the *saltica* and *torrida* Zones) a range of zones. The zonal positions of the following taxa have not been published: *Spinatrypina (Exatrypa) kuniandia*, *S. (S.) prideri prideri*, and *S. (S.) prideri nurungunia*.

## SYSTEMATIC LIST OF BRACHIOPOD SPECIES

In this list the species which have been described to date from the Devonian of the Canning Basin are in strict taxonomic order, using the classification in the Treatise on Invertebrate Paleontology, Part H, 1965, with significant subsequent emendments or additions. The entries are under the most recent names, with older synonyms appended, and further comment on major shifts in classification of some of the species and genera.

### ORTHIDA

#### ORTHACEA

##### Skenidiidae

*Skenidium asellatum* Veevers, 1959: 33-35, 1(1-11)

#### ENTELETACEA

##### Dalmanellidae, Dalmanellinae?

*Teichertina fitzroyensis* Veevers, 1959: 37-40, 2(1-16)

##### Dalmanellidae, Isorthinae

*Isorthis?* sp. indet. Veevers, 1959: 46-48, 2(17-21)

##### Mystrophoridae

*Hypsomyonia niphana* Veevers, 1959: 35-37, 1(12-22)

*Kayserella emanuelensis* Veevers, 1959: 41-43, 1(23-33)

##### Rhipidomellidae

*Rhipidomella incompta* Veevers, 1959: 43-45, 2(22-29)

##### Schizophoriidae, Schizophoriinae

*Schizophoria stainbrooki* Veevers, 1959: 48-50, 3(1-13)

*Schizophoria* sp. cf. *stainbrooki* Veevers

*Schizophoria pierrensis* Veevers, 1959: 50-52, 3(14-22)

*Schizophoria apiculata* Veevers, 1959: 42-54, 4(1-14)

*Schizophoria* sp. ind. Veevers, 1959: 54-55, 2(30-38)

### STROPHOMENIDA

#### STROPHOMENACEA

##### Strophomenidae, Leptaeninae

*Leptaena* sp. ind. Veevers, 1959: 57-60, 5(22-28)

#### STROPHEODONTACEA

##### Douvillinae, Douvillinellinae

*Hercostrophia exquisita* (Veevers, 1959): 60-62, 6(1-5) -- Harper & Boucot, 1978B, p. 148.

= *Douvillina (Douvillina) exquisita* Veevers, 1959

##### Leptostrophidiidae, Leptodontellinae

*Zophostrophia ungamica* Veevers, 1959: 63-65, 6(6-12) -- Harper & Boucot, 1978A, p. 88.

##### Leptostrophidiidae, Nervostrophinae

*Nervostrophia bunapica* Veevers, 1959: 65-69, 7(1-8) -- Harper & Boucot, 1978A, p. 90.

#### FARDENIACEA

##### Schuchertellidae

*Schuchertella dromeda* Veevers, 1959: 69-72, 5(11-21)

*Schuchertella gratillica* Veevers, 1959: 72-73, 5(1-10)

### PRODUCTIDA

#### STROPHALOSIIDINA

#### STROPHALOSIACEA

##### Araksalosiidae

*Veeversalosisia numida* (Veevers, 1959) - Lazarev, 1989, p. 35

= *Steinhagella numida* Veevers, 1959: 77-79, 9(11-20)



**PRODUCTIDINA****Leioproductidae**

*Devonoproductus australis* Veevers, 1959: 73-76, 8(16-21)

**Productellidae**

?*Productella occidua* Veevers, 1959 (Veevers, 1959a, pp. 23-26)

= *Productidae* gen. et sp. ind. Veevers, 1959: 85, 9(1-3)

cf. *Productella* sp. Veevers, 1959: 80, 8(24, 25)

cf. *Chonetipustula* sp. Veevers, 1959: 84-85, 8(22-23)

*Nigerinoplica proteus* (Veevers, 1959) - Lazarev, 1986, p. 45

= *Avonia proteus* Veevers, 1959: 80-84, 8(1-15)

Roberts (1971, p. 103) implied doubt over the generic position of this species by referring to it as '*Avonia*' *proteus* during his discussion of *Spinocarinifera adunata*. He considered Veevers' species "...probably more closely related to *Spinulicosta* Nalivkin than to *Spinocarinifera*. Lazarev included the species in his new genus *Nigerinoplica*, together with *Spinulicosta dotswoodae* McKellar, 1970.

**CHONETIDINA****Rugosochonetidae, Plicochonetinae**

*Plicochonetes macropatus* Veevers, 1959: 85-88, 9(4-10)

**PENTAMERIDA****PENTAMERACEA****Gypidulidae, Gypidulinae**

*Gypidula fragilis* Veevers, 1959: 56-57, 4(15-19)

**RHYNCHONELLIDA****Trigonirhynchiidae**

*Ptychomaletoechia lucida* (Veevers, 1959) -- Roberts, 1971, p. 149

= *Camarotoechia lucida* Veevers, 1959: 88-94, 10(1-11)

**Uncinulidae, Uncinulinae**

*Flabellulirostrum wolmericum* (Veevers, 1959) - Sartenaer, 1971, pp. 5-6

= *Uncinulus wolmericus* Veevers, 1959: 96-99, 10(36-50), 15(14-17)

*Phlogoiderhynchus arefactus* (Veevers, 1959) - Sartenaer, 1970, p. 19

= *Uncinulus arefactus* Veevers, 1959: 99-100, 11(8-13)

**Uncinulidae, Uncinulinae?**

*Fitzroyella primula* Veevers, 1959: 106-109, 16(1-10)

**Uncinulidae, Hypothyridininae**

*Hypothyridina margarita* Veevers, 1959: 100-104, 10(22-35)

**Pugnacidae**

?*Hypseloterorhynchus pennatus* Sartenaer, 1971: 4-5, 1(1)

*Pugnax hullensis* Veevers, 1959: 109-110, 11(14-19)

*Pugnax* sp. cf. *pugnax* (Martin, 1809)

*Pugnax* sp. cf. *acuminatus* (J. Sowerby, 1882); Veevers, 1959: 113, 11(20, 21)

**Familia incerta**

*Parvulaltarostrum veeversi* Sartenaer, 1979: 4 (type species)

= *Camarotoechia* sp. ind. Veevers, 1959: 94-96, 10(12-21)

*Nyge scopimus* Veevers, 1959: 113-116, 11(1-7)

Originally placed in the Coelospiridae (Atrypacea), but removed to the Rhynchonellida by Schmidt & McLaren (1965, p. H594). That position is followed here. However, it should be noted that Copper (1973, p. 117) has redefined coelospirinids (Anoplothechiidae) as athyrids. Johnson (1974, p. 437) rejected this, and included the Anoplothechiidae in the new spiriferide suborder Dayioidea. Campbell & Chatterton (1979) considered the Anoplothechiidae to be of uncertain superfamily position, not Dayiaceans; the Kayseriidae were placed in synonymy. The Treatise position is based on lack of known spiralia, and similarity with some Russian rhynchonellid taxa.

## ATRYPIDA

### Atrypidae, Atrypinae

- Atrypa (Kyrtatrypa) teichertii* (Coleman, 1951)  
 = *Atrypa reticularis teichertii* Coleman, 1951: 681-682, 100(1-10)  
 = *Atrypa parva* Coleman, 1951: 685, 102(18-22) (*partim*)  
 = *Atrypa reticularis teichertii* Coleman; Veevers, 1959: 116-119  
 = *Atrypa (Kyrtatrypa) teichertii* (Coleman 1951), Grey, 1978: 13-20, I(1,2)

### Atrypidae, Variatrypinae

- Desquamatia (Synatrypa) kimberleyensis* (Coleman, 1951)  
 = *Atrypa desquamata kimberleyensis* Coleman, 1951: 683, 101(7-19)  
 = *Atrypa multimoda* Coleman, 1951: 682, 100(11-18), 101(1-6)  
 = *Atrypa aspera prideri* Coleman, 1951 (*partim*), 102(7)  
 = *Atrypa desquamata kimberleyensis* Coleman, Veevers, 1959 (*partim* - not including *A. parva*): 119-121, not 15(13) (which is *Spinatrypina (Spinatrypina) prideri* - Grey, 1978, p. 33)  
 = *Desquamatia (Synatrypa) kimberleyensis* Coleman, Roberts, 1971: 168-171, 38(1-22)  
 = *Desquamatia (Synatrypa) kimberleyensis* (Coleman 1951), Grey, 1978: 20-33, II(1-3)

### Atrypidae, Spinatrypininae

- Spinatrypina (Spinatrypina) prideri* (Coleman, 1951)  
 = *Atrypa aspera prideri* Coleman, 1951: 684-685, 102(1-17) but not fig.7 (= *kimberleyensis*)  
 = *Atrypa parva* Coleman, 1951 (*partim* -- see Grey, 1978, p. 29):  
 = *Spinatrypina aspera prideri* (Coleman) 1951; Veevers, 1959: 121-123  
 = *Atrypa desquamata kimberleyensis* Coleman 1951 (*partim*), Veevers, 1959, 15(13) only -- Grey, 1978, p. 33

Roberts, 1971, pp. 171 *ff.*, transferred Coleman's species to *Spinatrypina*, and described a new subspecies from the Bonaparte Basin.

Grey, 1978, revised the atrypids, and divided Coleman's species into several subspecies. The material used by Veevers was not studied, apparently, and so the occurrences at the localities cited by Veevers cannot be assigned to these subspecies without further careful study. The currently recognised subspecies are:

*S. (S.) prideri prideri* (Coleman) -- transverse fairly coarsely ribbed shells with growth lamellae at a low angle to the shell in the troughs, flaring over the ribs; orthocline to apsacline beak, low wide triangular interarea. Sadler Limestone, Lennard Shelf.

*S. (S.) prideri nurungunia* Grey -- rounded more finely ribbed shells with more strongly imbricate lamellae uniformly inclined to the shell surface; orthocline to anacline strongly curved beak, high narrow interarea. Sadler and Pillara Limestones, Lennard Shelf.

*S. (S.) prideri larga* (Roberts) -- rounded shells with more widely spaced coarse ribs, more steeply angled lamellae, crowded marginally; strong median dorsal deflection of anterior commissure; beak initially orthocline, in adults anacline to hypercline; interarea small. Cockatoo Formation, Bonaparte Basin.

*Spinatrypina (Exatrypa) kuniandia* Grey, 1978: 45-50, V(1-3) -- Grey records this species from two localities (NOB12\*, NOB14) in the Sadler Limestone, and possibly from two others (MRM7, 26) in the Pillara Limestone. The first two are on Sadler Ridge southwest of Longs Well, MRM7 is on the west side of Bugle Gap, and MRM26 is northeast of the northern entrance to Bugle Gap.

## SPIRIFERIDA

### CYRTIACEA

#### Ambocoeliidae

- Ladjia saltica* Veevers, 1959: 126-128, 12(1-29)  
*Emanuella torrida* Veevers, 1959: 128-133, 13(1-9)  
*Crurithyris apena* Veevers, 1959: 133-136, 13(10-19)

#### Reticulariidae

- Reticulariopsis suchana* (Veevers, 1959): 136-140, 15(1-9)  
 = *Tingella suchana* Veevers, 1959. *Tingella* is placed in synonymy with *Reticulariopsis* by Pitrat (1965, p. H719).

**ATHYRIDA****ATHYRIDACEA****Athyrididae**

*Athyris oscarensis* Veevers, 1959: 140-144, 14(1-13)

**Meristellidae**

*Meristella(?) caprina* Veevers, 1959: 145-147, 14(14-21)

**TEREBRATULIDA****STRINGOCEPHALACEA****Stringocephalidae**

*Stringocephalus fontanus* Veevers, 1959: 148-150, 17(1-3, 4a, 4-6), 18(1a-d, 2-4)

**TEREBRATULACEA INCERTAE SEDIS**

Terebratulacea, gen. et sp. ind. I, Veevers, 1959: 150, 15(10)

Terebratulacea, gen. et sp. ind. II, Veevers, 1959: 150, 15(11,12)

**LIST OF FORMER NAMES WHICH HAVE CHANGED, giving the new names as in the above list:**

- Atrypa aspera prideri* -- see *Desquamatia (Synatrypa) kimberleyensis*, *Spinatrypina (S.) prideri*  
*Atrypa desquamata kimberleyensis* -- see *Desquamatia (Synatrypa) kimberleyensis*, *Spinatrypina (S.) prideri*  
*Atrypa multimoda* -- see *Desquamatia (Synatrypa) kimberleyensis*  
*Atrypa parva* -- see *A. (Kyratrypa) teicherti*, *Spinatrypina (S.) prideri*  
*Atrypa reticularis teicherti* -- see *A. (Kyratrypa) teicherti*  
*Avonia proteus* -- see *Nigerinoplica proteus*  
*Camarotoechia lucida* -- see *Ptychomaletoechia lucida*  
*Camarotoechia* sp. ind. Veevers, 1959 -- see *Parvulaltarostrum veeversi*  
*Douvillina (Douvillina) exquisita* -- see *Hercostrophia exquisita*  
*Productidae* gen. et sp. ind. Veevers, 1959 -- see *Productella occidua*  
*Spinatrypa aspera prideri* -- see *Spinatrypina (S.) prideri*  
*Steinhagella numida* -- see *Veeversalosis numida*  
*Tingella suchana* -- see *Reticulariopsis suchana*  
*Uncinulus arefactus* -- see *Phlogoiderhynchus arefactus*  
*Uncinulus wolmericus* -- see *Flabellulirostrum wolmericum*

## LOCALITIES IN VEEVERS, 1959

## SUMMARY LIST

In the following list the localities are grouped according to source (BMR, WAPET, or Teichert), and then alphanumerically. For each locality I give the 1:100,000 sheet name and number. For the BMR numbers I also give the full field number, as appearing on the air-photos (e.g. KDus108 for K108), or the level in a measured section, and any equivalence to other localities. Those of Teichert's localities which cannot be positioned on the current topographic sheets with any reliability are so noted. A full account of each locality, grouped according to 100,000 sheet area, follows in the next section.

## BMR &amp; WAPET 1953 localities

K98	(= KDupA98)	Bohemia 4160	
K103	(= section Dus1, level E)	Bohemia 4160	(= Teichert Loc. 62)
K108	(= KDus108)	Bohemia 4160	
K112	(= Kdus112)	Bohemia 4160	
K121	(close to K125, which = section DP3, level A)	Bohemia 4160	
K126	(= section DP3, level D1; close to K125)	Bohemia 4160	
K135	(= KDup135 = Dup2)	Bohemia 4160	
K142	(= Dud2)	Bohemia 4160	
K144	(= Dud2)	Bohemia 4160	
K145	(= Dub2)	Bohemia 4160	
K147	(= Dud3)	Bohemia 4160	(= Teichert Loc. 61, <i>partim</i> )
K148	(= Dud4)	Bohemia 4160	(= Teichert Loc. 61, <i>partim</i> )
K150	(= Dud5)	Bohemia 4160	(= Teichert Loc. 61, <i>partim</i> )
K153	(= Dud7)	Bohemia 4160	(= Teichert Loc. 61, <i>partim</i> )
K154	(= Dud8)	Bohemia 4160	(= Teichert Loc. 61, <i>partim</i> )
K159	(= section DB1, level B1)	Bohemia 4160	
K160	(= section DB1, level B1)	Bohemia 4160	
K166	(= section DB1, level F1)	Bohemia 4160	
K167	(= section DB1, level F1; = K166)	Bohemia 4160	
K168	(= section DB1, level G1)	Bohemia 4160	
K169	(= section DB1, level K1)	Bohemia 4160	
K170	(= section DB1, level K1)	Bohemia 4160	
K172	(= Dup5)	Bohemia 4160	
K173	(= section DP2, level A)	Bohemia 4160	
K174	(= Dup4)	Bohemia 4160	
K177	(= KDup177 = Dup8)	Bohemia 4160	
K179	(= section DP2, level H)	Bohemia 4160	
K180	(= K179, section DP2, levels H-J)	Bohemia 4160	
K181	(= section DP2, level E1)	Bohemia 4160	
K209	(= section DMP2, level C2)	Bruten 4060	
K210	(= section DMP2, level C3)	Bruten 4060	
K213	(= section DMP2, level E2)	Bruten 4060	
K214	(= section DD1, level A1)	Bruten 4060	
K215	(= section DD1, level A2)	Bruten 4060	
K216	(= section DD1, level A3)	Bruten 4060	
K217	(= section DD1, level A4)	Bruten 4060	
K218	(= section DD1, level A5)	Bruten 4060	
K219	(= section DD1, level B2)	Bruten 4060	
K220	(= section DD1, level C1)	Bruten 4060	
K221	(= section DD1, level D1)	Bruten 4060	
K222	(= section DD1, level D2)	Bruten 4060	

K223	(= section DD1, level D3)	Bruten 4060	
K224	(= section DD1, level D4)	Bruten 4060	
K225	(= section DD1, level D5)	Bruten 4060	
K226	(= section DD1, level D6)	Bruten 4060	
K227	(= section DD1, level D7)	Bruten 4060	
K228	(= section DD1, level E1)	Bruten 4060	
K229	(= section DD1, level E2)	Bruten 4060	
K230	(= section DD1, level E3)	Bruten 4060	
K231	(= section DD1, level E5)	Bruten 4060	
K235	(= section DD2, level B2)	Bruten 4060	
K236	(= section DD2, level C1)	Bruten 4060	
K237	(= section DD2, level C2)	Bruten 4060	
K238	(= section DD2, level C3)	Bruten 4060	
K239	(= section DD2, level C4)	Bruten 4060	
K240	(= section DD2, level C5)	Bruten 4060	
K241	(= section DD2, level C6)	Bruten 4060	
K242	(= section DD2, level C7)	Bruten 4060	
K243	(= section DD2, level C8)	Bruten 4060	
K244	(= section DD2, level C9)	Bruten 4060	
K245	(= section DD2, level C10)	Bruten 4060	
K246	(= section DD2, level C11)	Bruten 4060	
K247	(= section DD2, level D2)	Bruten 4060	
K248	(= section DD2, level D3)	Bruten 4060	
K249	(= section DD2, level D4)	Bruten 4060	
K250	(= section DD2, level D5)	Bruten 4060	
K251	(= section DD2, level D7)	Bruten 4060	
K252	(= section DD2, level D8)	Bruten 4060	
K253	(= section DD2, level D9)	Bruten 4060	
K264	(= section DD3, level B1)	Fitzroy Crossing 4061	
K265	(= section DD3, level C1)	Fitzroy Crossing 4061	
K266	(= section DD3, level C2)	Fitzroy Crossing 4061	
K267	(= section DD3, level C3)	Fitzroy Crossing 4061	
K268	(= section DD3, level C4)	Fitzroy Crossing 4061	
K269	(= section DD3, level C5)	Fitzroy Crossing 4061	
K270	(= section DD3, level C6)	Fitzroy Crossing 4061	
K271	(= section DD3, level C7)	Fitzroy Crossing 4061	
K272	(= section DD3, level C8)	Fitzroy Crossing 4061	
K273	(= section DD3, level D2)	Fitzroy Crossing 4061	
K274	(= section DD3, level D3)	Fitzroy Crossing 4061	
K275	(= section DD3, level E2)	Fitzroy Crossing 4061	
K276	(= section DD3, level E4)	Fitzroy Crossing 4061	
K282	(= KDuf282)	Cunningham 3961	
K283	(= KDuf283)	Cunningham 3961	(= Teichert Locality 2)
K285	(= KDuf285)	Fitzroy Crossing 4061	(= Teichert Locality 4)
K287		Elma 4161	
K288	(= K287)	Elma 4161	
K289	(= section DF2, level A1)	Elma 4161	
K290	(= section DF2, level A2)	Elma 4161	
K291	(= section DF2, level A3)	Elma 4161	
K292	(= section DF2, level A4)	Elma 4161	(approx. = K318)
K300	(= KDud300)	Fitzroy Crossing 4061	
K301	(= KDud301)	Fitzroy Crossing 4061	
K315	(= section DL2, level E1)	Elma 4161	
K318	(= section DL2, level E3)	Elma 4161	(approx. = K292)
K319	(= section DF3, level A1)	Elma 4161	
K320	(= section DF3, level A2)	Elma 4161	
K322	(= Duf1)	Elma 4161	

K327	(= Duf3)	Elma 4161
K340	(= section DL1, level E3)	Elma 4161
K341	(= section DL1, level E4)	Elma 4161
K355	(= KDud355)	Elma 4161
K356	(= KDud356)	Elma 4161
K438	(= KDmp61)	Fitzroy Crossing 4061
K463	(= section DMP1, level A11)	Fitzroy Crossing 4061
K480	(= Dul23???)	Elma 4161
K503	(= KDu503)	Hooper 4062
K506	(= KDus506; section DS2, level A3)	Fitzroy Crossing 4061
K539	(= section DO1, level A1)	Leopold Downs 3962
K551	(= section DF8, level A1)	Leopold Downs 3962
K571	(= section Dmp5, level C2)	Lennard 3863
K572	(= section Dmp5, level C2; = K571)	Lennard 3863
K573	(= section Dmp5, level C3)	Lennard 3863
G23	(= Dud52)	Bohemia 4160

### WAPET 1956 Oscar Range Localities

A copy of the WAPET locality map is held by BMR, with all but one locality (F5) shown on it. The 10,000 yard grid as also appearing on the maps in Playford & Lowry (1956) is shown on the map, enabling the localities to be replotted at 1:100,000 scale with reasonable accuracy. The localities replotted, and the sheets on which they lie, are:

Ld8	Ellendale 3862	Ld29	Leopold Downs 3962
Ld9	Ellendale 3862	Ld30	Leopold Downs 3962
Ld10	Leopold Downs 3962	Ld31	Leopold Downs 3962
Ld11	Leopold Downs 3962	Ld32	Leopold Downs 3962
Ld16	Leopold Downs 3962	Ld33	Leopold Downs 3962
Ld17	Leopold Downs 3962	S4/91	Leopold Downs 3962
Ld19	Leopold Downs 3962	O/66	Leopold Downs 3962
Ld20	Leopold Downs 3962	O/67	Leopold Downs 3962
Ld21	Leopold Downs 3962	O/73	Ellendale 3862
Ld25	Ellendale 3862	O/76	Leopold Downs 3962
Ld26	Ellendale 3862	O/77	Leopold Downs 3962
Ld28	Leopold Downs 3962		

### Teichert Localities

Simply from the positions shown on Plate 1 in Teichert's report (Teichert, 1949), his published localities cannot be positioned with useful accuracy on the modern topographic sheets. However, the unpublished localities listed by Veevers (pp. 163-165), who quoted latitudes and longitudes, can be plotted with acceptable accuracy, and many of the published ones (Veevers, pp. 161-163) can be placed well enough for the stratigraphic position to be checked against the maps of Playford & Lowry (1966). In the following two-part list I follow Veevers' convention of prefixing published Teichert localities with 'T'.

#### *Localities in Teichert, 1949:*

T1	Hooper 4062	Cannot be closely positioned.
T2	Cunningham 3961	= K283, which see.
T4	Fitzroy Crossing 4061	= K285, which see.
T5	Fitzroy Crossing 4061	near K285
T9	Elma 4161	Cannot be closely positioned.
T11	Fitzroy Crossing 4061	
T12	Fitzroy Crossing 4061	
T18	Fitzroy Crossing 4061	
T19	Fitzroy Crossing 4061	Cannot be closely positioned.
T25	Fitzroy Crossing 4061	

T26	Fitzroy Crossing 4061	
T27	Fitzroy Crossing 4061?	Noted in text to be in the Mt Pierre area.
T31	Fitzroy Crossing 4061	
T39	Fitzroy Crossing 4061	
T40	Fitzroy Crossing 4061	Cannot be closely positioned.
T42	Bruten 4060	Cannot be closely positioned.
T53	Bruten 4060	
T54	Bruten 4060	
T57	Bruten 4060	
T58	Bruten 4060	
T61	Bohemia 4160	= K147, which see
T69	Bohemia 4160	

*Teichert localities published by Veevers, 1959:*

F29	Lennard 3863	KP143	Leopold Downs 3962
F32	Lennard 3863	KP144	Leopold Downs 3962
F33	Lennard 3863	KP149	Cunningham 3961
F34	Lennard 3863	KP150	Hooper 4062
KP72	Lennard 3863	KP152	Leopold Downs 3962
KP84	Leopold Downs 3962	KP156	Ellendale 3862
KP101	Leopold Downs 3962	KP157	Ellendale 3862
KP103	Leopold Downs 3962	KP164	Ellendale 3862
KP106	Leopold Downs 3962	KP167	Ellendale 3862
KP107	Leopold Downs 3962	KP168	Lennard 3863
KP109	Leopold Downs 3962	KP181	Ellendale 3862
KP111	Leopold Downs 3962	M2	Lennard 3863
KP134	Leopold Downs 3962	M3	Lennard 3863
KP140	Leopold Downs 3962	M8	Lennard 3863
KP141	Leopold Downs 3962	M9	Lennard 3863

## DETAILS - GROUPED BY 1:100,000 SHEET AREA

In this section, I have grouped the localities by 1:100,000 sheet areas, themselves arranged alphabetically. For each sheet I show the localities (including those of Teichert which can be positioned with reasonable accuracy) on sections of the maps at that scale, or where appropriate enlarged to 1:50,000. Widely separated sections of the same sheet are listed and illustrated separately.

Each description starts with Veevers' original summary description and air-photo reference (to 1947 photography), including the air-photo coordinates. The latter comprise the quadrant on the photo (oriented with inscription at the bottom), the quadrants running clockwise from A at top left, then x and y coordinates in inches measured outwards from the photo centre (leftward or downward directions are thus still positive numbers), and the diagonal distance in inches from the photo centre. For brevity, I cite these coordinates as, e.g., A/0.70/2.94/3.02. There follows a description in terms of the current topographic maps, with the Australian Metric Grid reference (including UTM zone letters) to a degree of precision appropriate to the accuracy of transcribing the localities from the photos to the maps. This is usually about  $\pm 20$  m where there are usable topographic guides, but this takes no account of the inherent accuracy of the map itself. I also give the latitude and longitude in decimal degrees, to the same precision (on the 1:100,000 sheets, four decimal places is at the limit of plotting accuracy -- about  $\pm 0.1$  mm). Where appropriate I include comment on or corrections to Veevers' published data. Teichert's localities are separately described only where they are not equated with one of the later collections.

**BOHEMIA 1:100,000 SHEET -- FIGURE 1**

The photos are those for the Mount Ramsay 1:250,000 sheet, except for locality G23, on the Noonkanbah photos .

K98 (KDupA98): "Bugle Gap", Run 10, photo D5372, coordinates A/0.70/2.94/3.02.

At the crest of Bugle Gap, between the Laidlaw and Lawford Ranges, northeast of the Glenister Knolls. About 650 m west of the track north from Pinnacle Spring to Galeru Gorge.

AE 18791.793241; 18.6757°S, 126.0415°E

K103 (section Dus1, level E; Teichert Loc. 62): "Gap in reef limestone on old road from Mt. Pierre Well to Old Bohemia", Run 10, photo D5372, coordinates given as D/2.44/0.44/2.48 but quadrant actually C.

On the eastern edge of the Lawford Range where the track north to Galeru Gorge passes through the range, about 3 km south of the gorge.

AE 19197.793634; 18.6407°S, 126.0808°E

K108 (KDus108): "Old Bohemia area", Run 10, photo D5371, coordinates B/3.56/0.60/3.60.

On the northeast side of a low hill about 400 m southwest of Mount Pierre Creek, 2.5 km east-southeast of Galeru Gorge.

AE 19466.793788; 18.6268°S, 126.1057°E

K112 (Kdus112): "Old Bohemia area", Run 10, photo D5371, coordinates A/1.57/1.12/1.94.

About 130 m southwest of a gully at the southern end of the Teichert Hills.

AE 19424.793164; 18.6836°S, 126.1018°E

K121 (close to K125, which is section DP3, level A): "Old Bohemia area", Run 10, photo D5371, coordinates approximately A/2.24/0.80/2.38. This point is not plotted on the photo, but is close to K125, which is. In or just north of a gully south of the Teichert Hills, about 8.5 km south-southeast of Galeru Gorge. Not plotted on Figure 1 -- see K125.

AE 1947.79307; 18.692°S, 126.105°E

K125 (section DP3, level A; reference for K121, K126): Run 10, photo D5371; coordinates for base of section DP3 given as A/2.30/0.80/2.44. Only the position of DP3 level A is plotted on the photo.

DP3,A is just north of the gully mentioned under K121, and is at:

AE 19469.793070; 18.6920°S, 126.1054°E

K126 (section DP3, level D1; close to K125): "Southern part, Old Bohemia area; 165 ft (50 m) above base of section DP3", Run 10, photo D5371; coordinates - see K125. K126 was not itself plotted on the photo, and is not plotted in Fig. 1. See K125.

AE 1947.79307; 18.692°S, 126.105°E

K135 (KDup135 = Dup2): "Old Bohemia area", Run 10, photo D5371, coordinates given as D/2.54/0.90/2.70 but the quadrant is actually C.

On the eastern side of a low hill, about 180 m southwest of Mount Pierre Creek, about 0.5 km southeast of a waterhole on the creek, 4.5 km east-southeast of Galeru Gorge.

AE 19657.793670; 18.6380°S, 126.1243°E

K142 (Dud2): "Eastern side of Bugle Gap", Run 11, photo D5267, coordinates B/1.76/1.74/2.48.

At the foot of the scarp forming the southern end of the Emanuel Range north of Pinnacle Creek, about 100 m east of a gully flowing southwards out of the range. This is several kilometres west of the southern end of Bugle Gap, which suggests that either the locality was wrongly plotted on the air-photo, or Veevers' description is incorrect! Locality and stratigraphic position must be treated as unreliable.

AE 18429.792654; 18.7290°S, 126.0064°E

K144 (Dud2): As K142. The two localities are plotted as the one point on the photo, and so the comment on reliability applies also to this locality.

AE 18429.792654; 18.7290°S, 126.0064°E



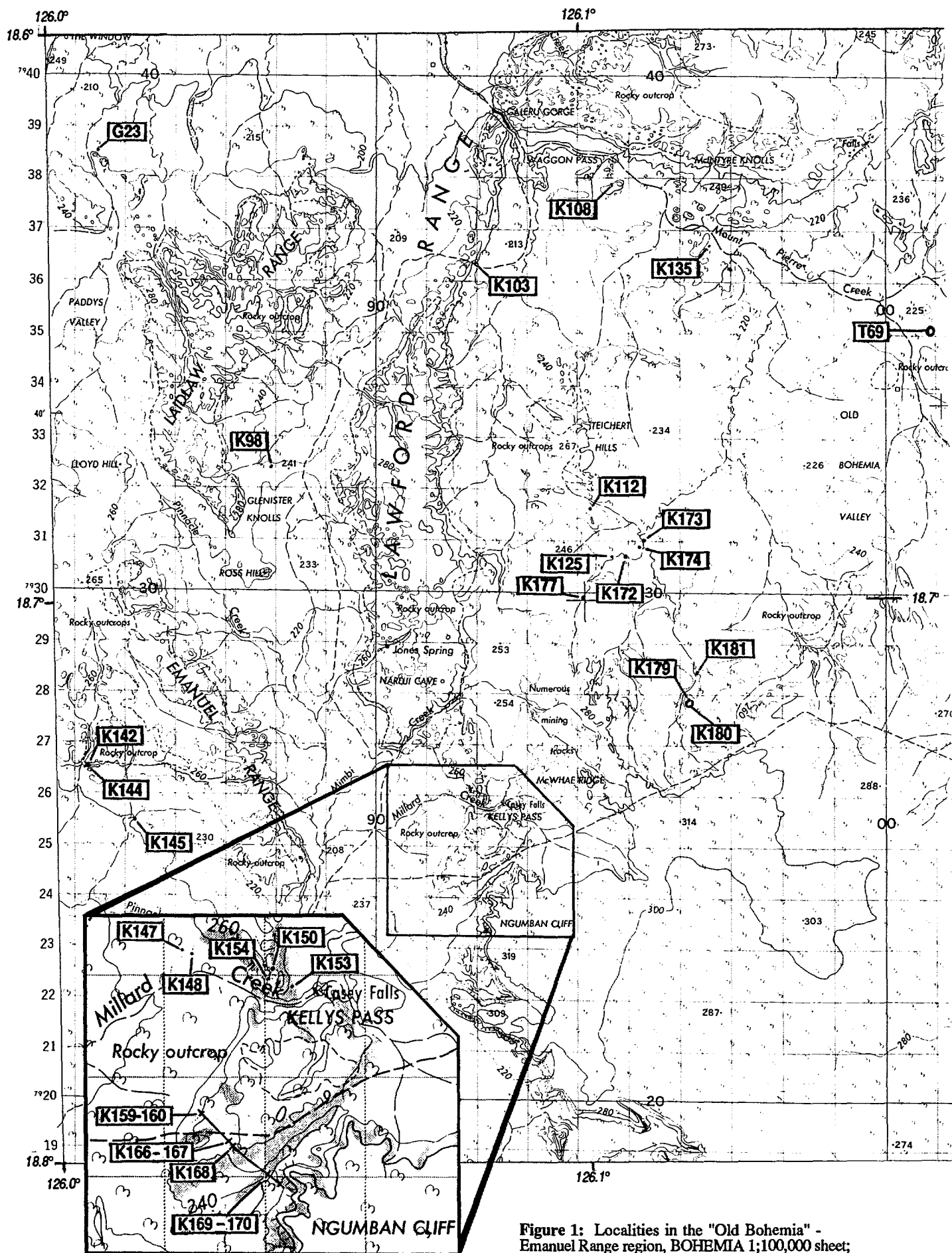


Figure 1: Localities in the "Old Bohemia" - Emanuel Range region, BOHEMIA 1:100,000 sheet; inset - the Casey Falls area enlarged to 1:50,000. Note that Waggon Pass is at 918 364, not at Galeru Gorge, and that Bugle Gap, not marked, is west of the Lawford Range.

- K145 (Dub2): "Eastern side of Bugle Gap", Run 11, photo D5267, coordinates B/0.92/1.04/1.39.  
In or beside a gully flowing south from the Emanuel Range towards Pinnacle Creek, 3.5 km northwest of Pinnacle Spring. This point, too, is well to the west of the described position, making the locality and stratigraphy unreliable.  
AE 18518.792550; 18.7387°S, 126.0144°E
- K147 (Dud3; Teichert Loc. 61, *partim*): "Reef and brachiopod limestone overlain by red beds at foot of main reef limestone. 6.6 miles from Mt. Pierre Well on old road to Old Bohemia" (referring to Teichert Locality 61, i.e. K147-154), Run 11, photo D5266, coordinates D/1.87/0.36/1.90.  
About 250 m north of Millard Creek, 1.4 km west-northwest of Casey Falls, Kellys Pass, southern Lawford Range.  
AE 19119.792626; 18.7132°S, 126.0716°E
- K148 (Dud4; Teichert Loc. 61, *partim*): as K147, but coordinates D/1.83/0.46/1.88.  
About 200 m north of Millard Creek, 100 m east-southeast of K147, 1.3 km west-northwest of Casey Falls, Kellys Pass, southern Lawford Range.  
AE 19129.792621; 18.7133°S, 126.0725°E
- K150 (Dud5; Teichert Loc. 61, *partim*): as K147, but coordinates D/1.73/1.10/2.03.  
Near the top of a low ridge, 300 m north of Millard Creek, 500 m west-northwest of Casey Falls, Kellys Pass, southern Lawford Range.  
AE 19204.792608; 18.7134°S, 126.0800°E
- K153 (Dud7; Teichert Loc. 61, *partim*): as K147, but coordinates D/1.62/1.12/2.02.  
At the southeastern end of a low ridge, 200 m north of Millard Creek, 250 m west of Casey Falls, Kellys Pass, southern Lawford Range.  
AE 19227.792588; 18.7136°S, 126.0820°E
- K154 (Dud8; Teichert Loc. 61, *partim*): as K147, but coordinates D/1.68/1.08/2.00.  
On the south side of a low ridge, 200 m north of Millard Creek, 500 m west of Casey Falls, Kellys Pass, southern Lawford Range.  
AE 19203.792597; 18.7135°S, 126.0798°E
- K159 (section DB1, level B1): "Type section of Bugle Gap Limestone - South-eastern wall of Bugle Gap (75' below base of type section)", Run 11, photo D5266, coordinates of base of section D/0.52/0.52/0.73.  
At the northwestern end of section DB1, 200 m north of an old track, 2.15 km southwest of Casey Falls, Kellys Pass. The section runs southeast towards the foot of Ngumban Cliff.  
AE 19135.792464; 18.7147°S, 126.0733°E
- K160 (section DB1, level B1): As K159, but 60 feet (18.3 m) below the base of the Bugle Gap Limestone.  
On the photo, K159 and K160 are plotted together simply as DB1,B1.  
AE 19135.792464; 18.7147°S, 126.0733°E
- K166, 167 (section DB1, level F1): As K159, but 380 ft (115.8 m) above the base of the Bugle Gap Limestone - Veevers equates the two localities.  
100 m south of the track, 1.75 km southwest of Casey Falls.  
AE 19164.792437; 18.7500°S, 126.0757°E
- K168 (section DB1, level G1): As K159, but 700 ft (213.4 m) above the base of the Bugle Gap Limestone.  
130 m south of the track, 1.75 km southwest of Casey Falls.  
AE 19167.792429; 18.7502°S, 126.0762°E
- K169 (section DB1, level K1): As K159, but 1,120 ft (341.4 m) above the base of the Bugle Gap Limestone.  
380 m south of the track, 1.9 km south-southwest of Casey Falls.  
AE 19203.792401; 18.7527°S, 126.0793°E

K170 (section DB1, level K1): As K169, but slightly lower at 1,100 ft (335.3 m) above the base of the Bugle Gap Limestone.

On the photo, K169 and K170 are plotted together simply as DB1,K1.

AE <sup>1</sup>9203.<sup>79</sup>2401; 18.7527°S, 126.0793°E

K172 (Dup5): "Southern part of Old Bohemia area", Run 10, photo D5370, coordinates A/2.07/3.60/4.18.

Upper reaches of tributary creek to Mount Pierre Creek, southeast of the Teichert Hills, 5.5 km north-northeast of Casey Falls.

AE <sup>1</sup>9494.<sup>79</sup>3072; 18.6923°S, 126.1079°E

K173 (section DP2, level A): "Southern part of Old Bohemia area", Run 10, photo D5370, coordinates A/1.84/3.56/3.85.

About 100 m south of a creek junction south-southeast of the Teichert Hills, some 450 m northeast of K172.

AE <sup>1</sup>9523.<sup>79</sup>3100; 18.6823°S, 126.1114°E

K174 (Dup4): "Southern part of Old Bohemia area", Run 10, photo D5370, coordinates A/1.96/3.42/3.95.

About 60 m west of junction of north-flowing gully with tributary creek to Mount Pierre Creek, about 200 m south of K173.

AE <sup>1</sup>9522.<sup>79</sup>3091; 18.6905°S, 126.1104°E

K177 (KDup177 = Dup8): "Southern part of Old Bohemia area", Run 10, photo D5371, coordinates A/2.86/1.30/3.14.

Upper reaches of tributary creek to Mount Pierre Creek, southeast of the Teichert Hills, about 4.5 km north-northeast of Casey Falls. The point could not be transferred from the photo as accurately as most others, because of distortion towards the edge of the photo, and few local topographic markers.

AE <sup>1</sup>941.<sup>79</sup>299; 18.6995°S, 126.0998°E

K179 (section DP2, level H): "Southern part of Old Bohemia area", Run 11, photo D5265, coordinates D/3.50/0.76/3.60.

About 2 km northeast of McWhae Ridge.

AE <sup>1</sup>9615.<sup>79</sup>2790; 18.7177°S, 126.1194°E

K180 (section DP2, levels H-J): coordinates etc. given by Veevers as for K179; DP2,H and DP2,J are plotted separately on the photo, and are about 130-150 m apart. This suggests the collection is a generalised one.

AE <sup>1</sup>962.<sup>79</sup>278; 18.718°S, 126.1195°E

K181 (section DP2, level E1): "Southern part of Old Bohemia area", Run 11, photo D5265, coordinates D/4.02/0.90/4.12.

Head of creek at foot of scarp, 7.5 km south-southeast of Kellys Pass.

AE <sup>1</sup>9637.<sup>79</sup>2843; 18.7129°S, 126.1213°E

G23 (Dud52): "Longs Well area", Noonkanbah 1:250,000 sheet and photos, Run 9A, photo C5174, coordinates given as D/0.14/1.78/1.80, but the point is actually in quadrant C.

On the north side of a low hill east of a tributary of Mount Pierre Creek, northwest of the Laidlaw Range between Paddys Valley and The Window.

AE <sup>1</sup>8445.<sup>79</sup>3850; 18.6203°S, 126.0097°E

T69: "¼ to ½ mile east of Old Bohemia".

On the east side of the southern branch of Mount Pierre Creek, Old Bohemia Valley.

Approximately BE <sup>2</sup>010.<sup>79</sup>340; 18.662°S, 126.166°E

**BRUTEN 1:100,000 SHEET -- FIGURE 2**

Photos: Noonkanbah 1:250,000 sheet.

**Section DMP2** -- "Gap Creek", on Run 8A, photo E5335, coordinates for the base given as D/2.48/0.24/2.50; the point actually lies in quadrant C. The section runs northeasterly along the southeast side of Kudata Gap. On the photo only three points are plotted: A, D and E3. A and D lie close together, so levels C2 and C3 can be plotted fairly accurately, taking stratigraphic position into account. Level E2 is a little less certain, but is assumed to be a little to the southwest of E3. In Fig. 2 the points are shown in their positions of best estimate, but the coordinates given express the appropriate level of precision.

K209 (level C2): 41.1 m (135 ft) above section base.

ZV <sup>8</sup>068.<sup>79</sup>398; 18.6101°S, 125.9075°E

K210 (level C3): 57.9 m (190 ft) above section base.

ZV <sup>8</sup>068.<sup>79</sup>398; 18.6098°S, 125.9075°E

K213 (level E2): distance above base not stated by Veevers, but Hill & Jell (1970) give it as 450 ft (137 m).

ZV <sup>8</sup>073.<sup>79</sup>403; 18.6047°S, 125.901°E

**Section DD1** -- Run 8A, photo E5335, coordinates for the base B/3.20/1.40/3.48. The section runs northeasterly across the northeast slope of the Emanuel Range from a point 1.8 km east of Gap Spring; it is 2.5 km long. Only points A, D, E and F were plotted on the photo. The levels of the various collections have been estimated from the published section details and the spacing of the control points, on the assumption of uniform dip and low topographic relief. It is also assumed that A = A1, etc.; the Sadler Formation in this section is 363.9 m (1194 ft) thick.

K214 (level A1): 3.7 m (12 ft) above the Pillara Limestone and the base of the Sadler Formation.

ZV <sup>8</sup>0876.<sup>79</sup>3864; 18.6202°S, 125.9258°E

K215 (level A2): 9.8 m (32 ft) above the Pillara Limestone.

ZV <sup>8</sup>0880.<sup>79</sup>3865; 18.6200°S, 125.9263°E

K216 (level A3): 14.6 m (48 ft) above the Pillara Limestone.

ZV <sup>8</sup>0882.<sup>79</sup>3867; 18.6196°S, 125.9266°E

K217 (level A4): 22.3 m (73 ft) above the Pillara Limestone.

ZV <sup>8</sup>0888.<sup>79</sup>3871; 18.6193°S, 125.9270°E

K218 (level A5): 31.7 m (104 ft) above the Pillara Limestone.

ZV <sup>8</sup>0893.<sup>79</sup>3874; 18.6190°S, 125.9274°E

K219 (level B2): 57.3 m (188 ft) above the Pillara Limestone.

ZV <sup>8</sup>091.<sup>79</sup>389; 18.6180°S, 125.9285°E

K220 (level C1): 80.8 m (265 ft) above the Pillara Limestone.

ZV <sup>8</sup>092.<sup>79</sup>390; 18.6171°S, 125.9297°E

K221 (level D1): 151.5 m (497 ft) above the Pillara Limestone.

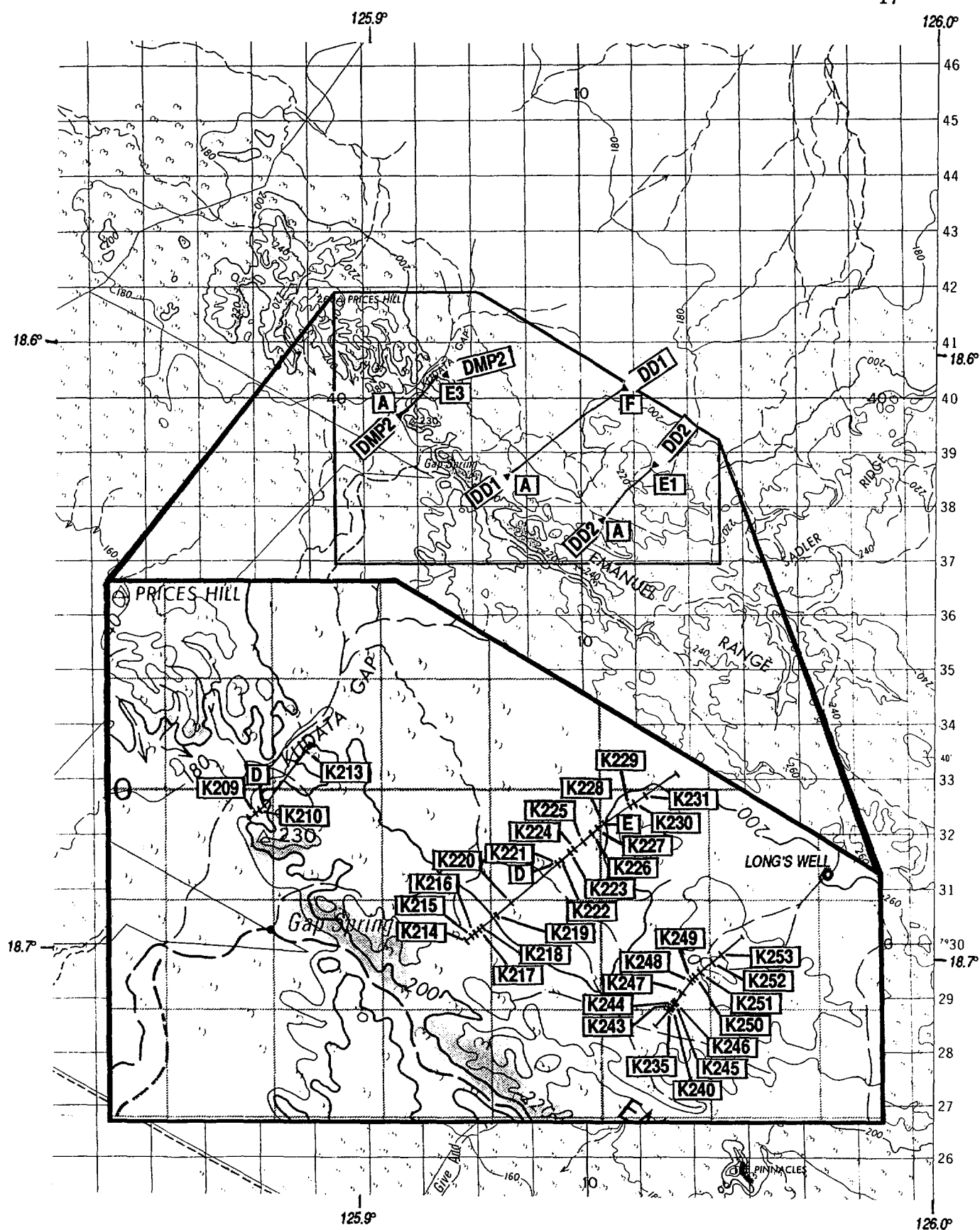
ZV <sup>8</sup>0961.<sup>79</sup>3935; 18.6136°S, 125.9335°E

K222 (level D2): 166.1 m (545 ft) above the Pillara Limestone.

ZV <sup>8</sup>0963.<sup>79</sup>3937; 18.6135°S, 125.9337°E

K223 (level D3): 179.5 m (589 ft) above the Pillara Limestone.

ZV <sup>8</sup>0969.<sup>79</sup>3941; 18.6132°S, 125.9342°E



**Figure 2:** Localities in the Emanuel Range - Sadler Ridge area (sections DMP2, DD1, DD2), BRUTEN 1:100,000 sheet; inset is the area of the measured sections, at 1:50,000.

K224 (level D4): 187.1 m (614 ft) above the Pillara Limestone.	ZV <sup>8</sup> 0973. <sup>79</sup> 3944; 18.6127°S, 125.9347°E
K225 (level D5): 207.9 m (682 ft) above the Pillara Limestone.	ZV <sup>8</sup> 098. <sup>79</sup> 395; 18.6120°S, 125.9357°E
K226 (level D6): 224.9 m (738 ft) above the Pillara Limestone.	ZV <sup>8</sup> 0992. <sup>79</sup> 3960; 18.6115°S, 125.9364°E
K227 (level D7): 239 m (ca 785 ft) above the Pillara Limestone.	ZV <sup>8</sup> 100. <sup>79</sup> 396; 18.6109°S, 125.9370°E
K228 (level E1): 249.9 m (820 ft) above the Pillara Limestone.	ZV <sup>8</sup> 1000. <sup>79</sup> 3968; 18.6108°S, 125.9378°E
K229 (level E2): 286.5 m (940 ft) above the Pillara Limestone.	ZV <sup>8</sup> 103. <sup>79</sup> 398; 18.6091°S, 125.9398°E
K230 (level E3): 291.1 m (955 ft) above the Pillara Limestone.	ZV <sup>8</sup> 103. <sup>79</sup> 399; 18.6088°S, 125.9402°E
K231 (level E5): 310.9 m (1020 ft) above the Pillara Limestone.	ZV <sup>8</sup> 104. <sup>79</sup> 399; 18.6081°S, 125.9410°E
Level F, the top of the section, is at ZV <sup>8</sup> 1071. <sup>79</sup> 4016.	
<p><b>Section DD2</b> -- Run 9a, photo C5175, coordinates of the section base A/0.00/1.16/1.16. This section extends northeast for about 1.2 km from a point near the head of Gap Creek 3.6 km east of Gap Spring, on the north side of the Emanuel Range 3.5 km northwest of the crest of Sadler Ridge. The section proved very difficult to transfer to the map, because the points plotted on the photo - A, C11, D3, D10, and E1 base - are either at the two ends, or grouped in the middle. Extrapolation is based on published thickness of the Sadler Formation in this section (Veevers &amp; Wells, 1961 - 231.6 m, 760 ft), the heights above the Pillara Limestone, and A being at the top of the Pillara Limestone.</p>	
K235 (level B2): 18.0 m (59 ft) above the Pillara Limestone.	ZV <sup>8</sup> 106. <sup>79</sup> 380; 18.6259°S, 125.9431°E
K236 (level C1): height uncertain, position estimated.	ZV <sup>8</sup> 106. <sup>79</sup> 380; 18.6258°S, 125.9431°E
K237 (level C2): height uncertain, position estimated as midway between K235 and K240.	ZV <sup>8</sup> 106. <sup>79</sup> 380; 18.6258°S, 125.9432°E
K238 (level C3): height uncertain, position estimated.	ZV <sup>8</sup> 106. <sup>79</sup> 380; 18.6257°S, 125.9432°E
K239 (level C4): height uncertain, position estimated.	ZV <sup>8</sup> 106. <sup>79</sup> 380; 18.6257°S, 125.9433°E
K240 (level C5): 23.5 m (77 ft) above the Pillara Limestone.	ZV <sup>8</sup> 1063. <sup>79</sup> 3801; 18.6256°S, 125.9434°E
K241 (level C6): height uncertain, position estimated.	ZV <sup>8</sup> 106. <sup>79</sup> 380; 18.6256°S, 125.9435°E
K242 (level C7): height uncertain, position estimated.	ZV <sup>8</sup> 107. <sup>79</sup> 380; 18.6255°S, 125.9436°E

- K243 (level C8): 26.8 m (88 ft) above the Pillara Limestone.  
ZV <sup>8</sup>1068.<sup>79</sup>3805; 18.6255°S, 125.9437°E
- K244 (level C9): height uncertain, position estimated. Hill & Jell (1970) give it as 87 ft up in the section, but note that for K245 they give the height as 89 ft, *contra* Veevers' 97 ft!  
ZV <sup>8</sup>107.<sup>79</sup>381; 18.6254°S, 125.9438°E
- K245 (level C10): 29.6 m (97 ft) above the Pillara Limestone.  
ZV <sup>8</sup>1069.<sup>79</sup>3807; 18.6252°S, 125.9439°E
- K246 (level C11): 31.1 m (102 ft) above the Pillara Limestone.  
ZV <sup>8</sup>1070.<sup>79</sup>3808; 18.6251°S, 125.9440°E
- K247 (level D2): 32.6 m (107 ft) above the Pillara Limestone.  
ZV <sup>8</sup>1075.<sup>79</sup>3815; 18.6243°S, 125.9451°E
- K248 (level D3): 34.7 m (114 ft) above the Pillara Limestone.  
ZV <sup>8</sup>1081.<sup>79</sup>3828; 18.6233°S, 125.9452°E
- K249 (level D4): 37.5 m (123 ft) above the Pillara Limestone.  
ZV <sup>8</sup>1085.<sup>79</sup>3828; 18.6631°S, 125.9453°E
- K250 (level D5): 47.9 m (157 ft) above the Pillara Limestone.  
ZV <sup>8</sup>109.<sup>79</sup>383; 18.6226°S, 125.9456°E
- K251 (level D7): 69.2 m (227 ft) above the Pillara Limestone.  
ZV <sup>8</sup>109.<sup>79</sup>383; 18.6225°S, 125.9460°E
- K252 (level D8): 131.1 m (430 ft) above the Pillara Limestone.  
ZV <sup>8</sup>110.<sup>79</sup>384; 18.6215°S, 125.9469°E
- K253 (level D9): 146.0 m (479 ft) above the Pillara Limestone. Assumed to be close to D10.  
ZV <sup>8</sup>110.<sup>79</sup>385; 18.6209°S, 125.9478°E
- T42: "About 1 mile E. of ... little hill (with reef on top) 5.6 miles S.E. of No. 3 Bore". From Teichert (1949, p. 54) the locality is near the road to Salty Bore, which is not marked on the Bruten sheet, but on the Playford & Lowry map is labelled Virgin Creek Bore. On the stated distances, etc., the position is about 3 km southeast of this bore, but Teichert's map shows it to be northwest of the bore, so his distances must be wrong. Both positions lie within extensive alluvium. Because of the uncertainty neither locality is plotted, but the latter (and presumably correct) position lies near ZV <sup>8</sup>005.<sup>79</sup>490 = 18.528°S, 125.846°E.
- T53: "Between small hills near Long's Well and reef limestone approximately South of Long's Well". Long's Well is not marked on the Bruten sheet, but lies at ZV <sup>8</sup>121.<sup>79</sup>392, about 1 km northeast of section DD2 in the angle between the Emanuel Range and Sadler Ridge. The exact locality is not clear, particularly as the air-photo (Noonkanbah 9A/C5175) shows quite a number of small hills in the vicinity. The description also implies that there may be two collections under this number. The point is not shown in Figure 2.
- T54: "Low hill of yellow limestone, north of reef limestone, approximately 1.5 miles southwest of Long's Well and ½ mile northwest of Locality 44" -- Veevers notes that this last part is incorrect, locality 44 being at least 12 km away. The first part of the description places the locality near the southwest end of section DD2, close to K275 (which see).
- T57: ".. in fault zone 3 miles N.W. of Long's Well on flat". This point lies on alluvial flats about 3.5 km east-northeast of Prices Hill. Approximate grid reference:  
ZV <sup>8</sup>090.<sup>79</sup>425; 18.585°S, 125.927°E

T58: "About 1/3 mile north of main reef limestone, east of Gap Creek Gap". According the Playford & Lowry's map, the outcrop of reef limestone starts 3 km southeast of The Gap (= Kudata Gap), near Sadler Ridge. Thus this locality must lie on the northern slope of the Emanuel Range between sections DD1 and DD2, west of Long's Well. It cannot be plotted with any accuracy, but is in the vicinity of  $8^{\circ}100.79390$ .

# CUNNINGHAM 1:100,000 SHEET -- FIGURE 3

Photo: Noonkanbah 1:250,000 sheet.

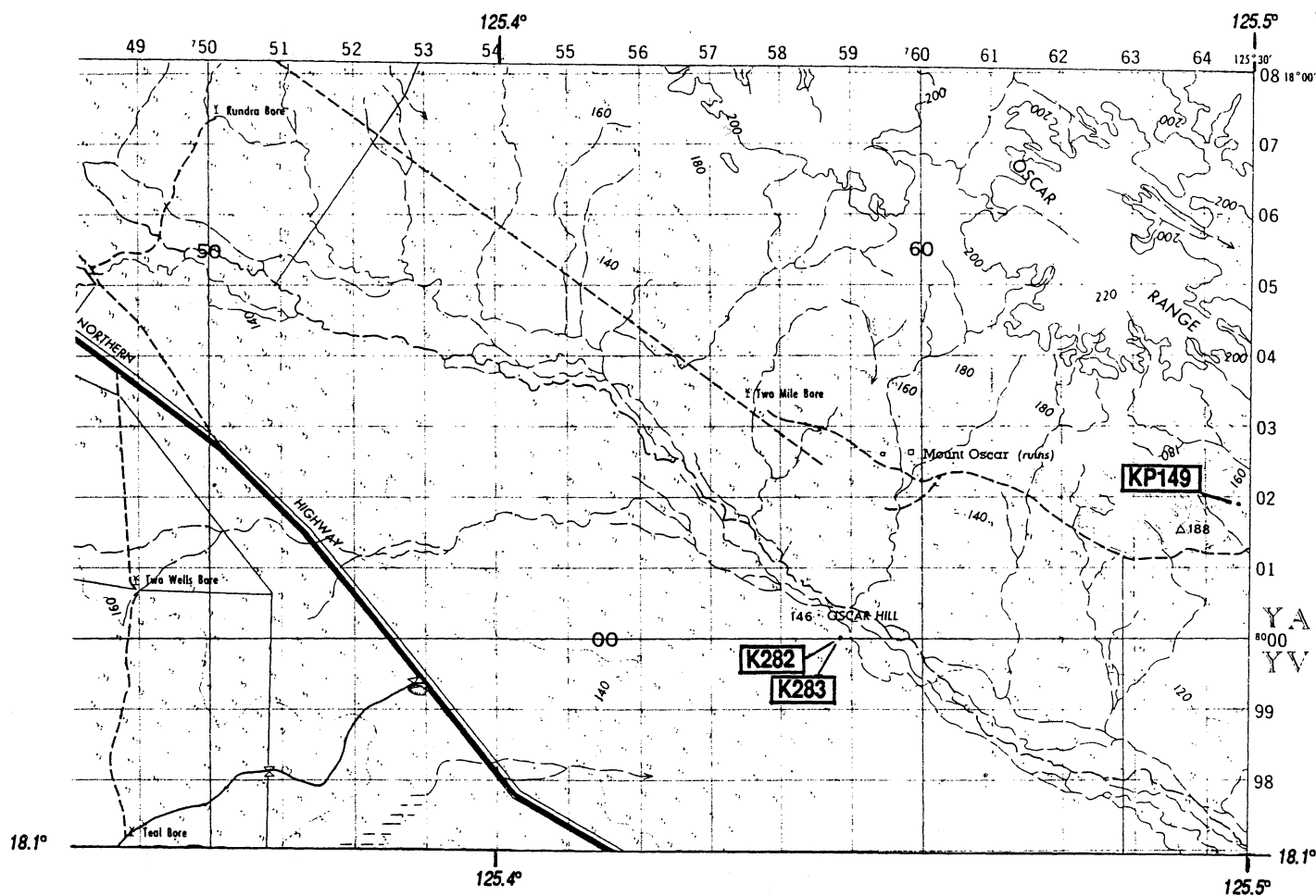


Figure 3: Localities in the "Mount Oscar" area, CUNNINGHAM 1:100,000 sheet.

K282 (KDuf282): "Oscar Hill". Run 1A, photo D5062, coordinates given as C/0.94/1.64/1.90 but the point is pricked in photo quadrant D.

450 m southeast of the crest of Oscar Hill, 4.3 km north-northeast of the Great Northern Highway.

YA  $75885.800002$ ;  $18.0731^{\circ}\text{S}$ ,  $125.4460^{\circ}\text{E}$

K283 (KDuf283): "Oscar Hill"; K282-284 are plotted as one locality on the photo -- see K282.

YA  $75885.800002$ ;  $18.0731^{\circ}\text{S}$ ,  $125.4460^{\circ}\text{E}$

KP149: "SE end of Oscar Ra. halfway between Station and Brooking Gorge" -  $18^{\circ}03.3'$ ,  $125^{\circ}29.9'$ . This lies 6 km east-northeast of Oscar Hill, about 700 m north of the track.

YA  $7644.80019$ ;  $18.055^{\circ}\text{S}$ ,  $125.499^{\circ}\text{E}$



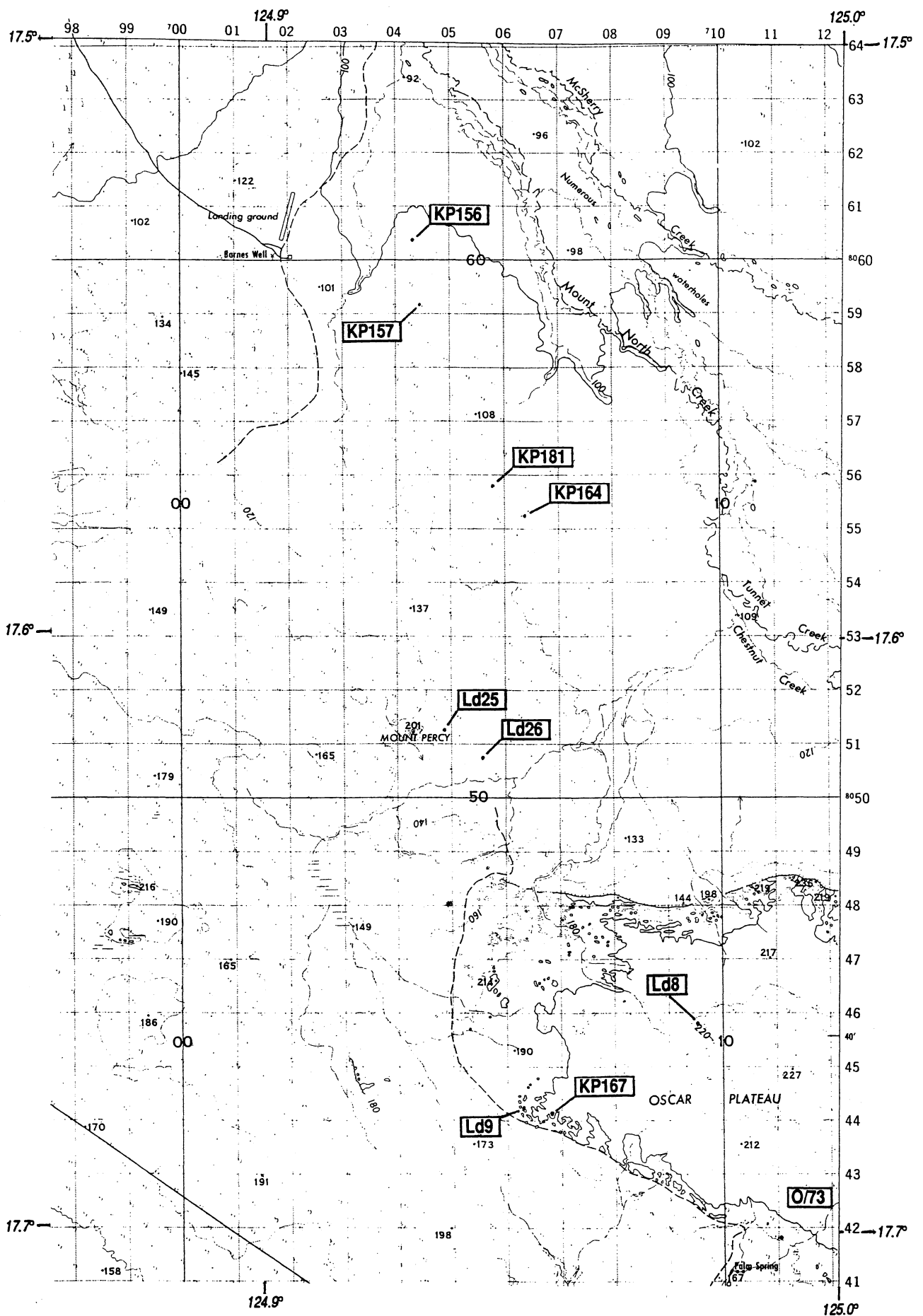


Figure 4: Localities in the western Oscar Plateau - Mount Percy - Barnes Well region, ELLENDALE 1:100,000 sheet.

**ELLEDALE 1:100,000 SHEET -- FIGURE 4**

All points on the Ellendale Sheet are either WAPET or unpublished Teichert localities. The former are on the Lennard River 1:250,000 sheet photos, but these are not available to me. However, as noted above they have also been plotted on a copy of the WAPET map held by BMR, and could be transferred thence to the current topographic sheets with a reasonable degree of accuracy. Veevers' quoted coordinates for Teichert's localities also permit reasonably accurate plotting.

Ld8: Run 11, photo 5074, coordinates B/1.1/0.05/-.

Oscar Plateau 4.6 km north of Palm Spring, 7.6 km southeast of Mount Percy.

YA 7095.<sup>80</sup>458; 17.6650°S, 124.9751°E

Ld9: Run 11, photo 5075, coordinates D/0.13/0.23/-.

Southwest edge of the Oscar Plateau, 200 m north of track, 5.2 km northwest of Palm Spring, 6 km due north of bend in telegraph line near Ninety Two Mile Creek.

YA 7062.<sup>80</sup>443; 17.6791°S, 124.9436°E

Ld25: "½ mile east of Mt. Percy"; Run 10, photo 5012, coordinates A/0.94/0.90/-.

600 m east of Mount Percy.

YA 7049.<sup>80</sup>513; 17.6160°S, 124.9310°E

Ld26: "1 mile E.S.E. of Mt. Percy"; Run 10, photo 5012, coordinates A/1.31/0.39/-.

1.4 km east-southeast of Mount Percy.

YA 7056.<sup>80</sup>508; 17.6203°S, 124.9376°E

O/73: Run 11, photo 5074, coordinates C/2.34/1.13/-.

1 km northeast of Palm Spring.

YA 7111.<sup>80</sup>418; 17.7011°S, 124.9901°E

KP156: 17° 32.0', 124° 55.5'. This lies about 2.5 km east of Barnes Well, 9 km north of Mount Percy.

YA 7043.<sup>80</sup>604; 17.533°S, 124.925°E

KP157: 17° 32.7', 124° 55.0'. About 3 km east-southeast of Barnes Well, 8 km north of Mount Percy.

YA 7045.<sup>80</sup>591; 17.545°S, 124.917°E

KP164: 17° 34.8', 124° 56.7'. Area of extensive alluvium about 4.5 km north-northeast of Mount Percy.

YA 7064.<sup>80</sup>553; 17.580°S, 124.945°E

KP167: 17° 40.8', 124° 57.0'. At the southwestern corner of the Oscar Plateau 4.5 km northwest of Palm Spring, 700 m east of WAPET locality Ld9.

YA 7068.<sup>80</sup>442; 17.680°S, 124.950°E

KP181: 17° 35.3', 124° 56.5'. Area of extensive alluvium about 4.8 km north-northeast of Mount Percy, 800 m northwest of KP164.

YA 7058.<sup>80</sup>558; 17.588°S, 124.942°E

**ELMA 1:100,000 SHEET - NORTHWEST LOCALITIES -- FIGURE 5**

Photos: Mount Ramsay 1:250,000 sheet.

K319 (section DF3, level A1): "7 miles [11.3 km] ENE of Bullock Paddock Bore, Fossil Downs (15' [4.6 m] above base of Fairfield Beds in section DF3)", Run 2, photo A5574, coordinates B/2.34/1.60/2.84.

On the southeast side of a low rise, about 800 m east of the track north from the Hull Range to Sadlers Yard, about 2 km south of its crossing of Middle Creek, southwest of the Baramundi Range.

AE 19091.<sup>79</sup>9816; 18.0835°S, 126.0801°E

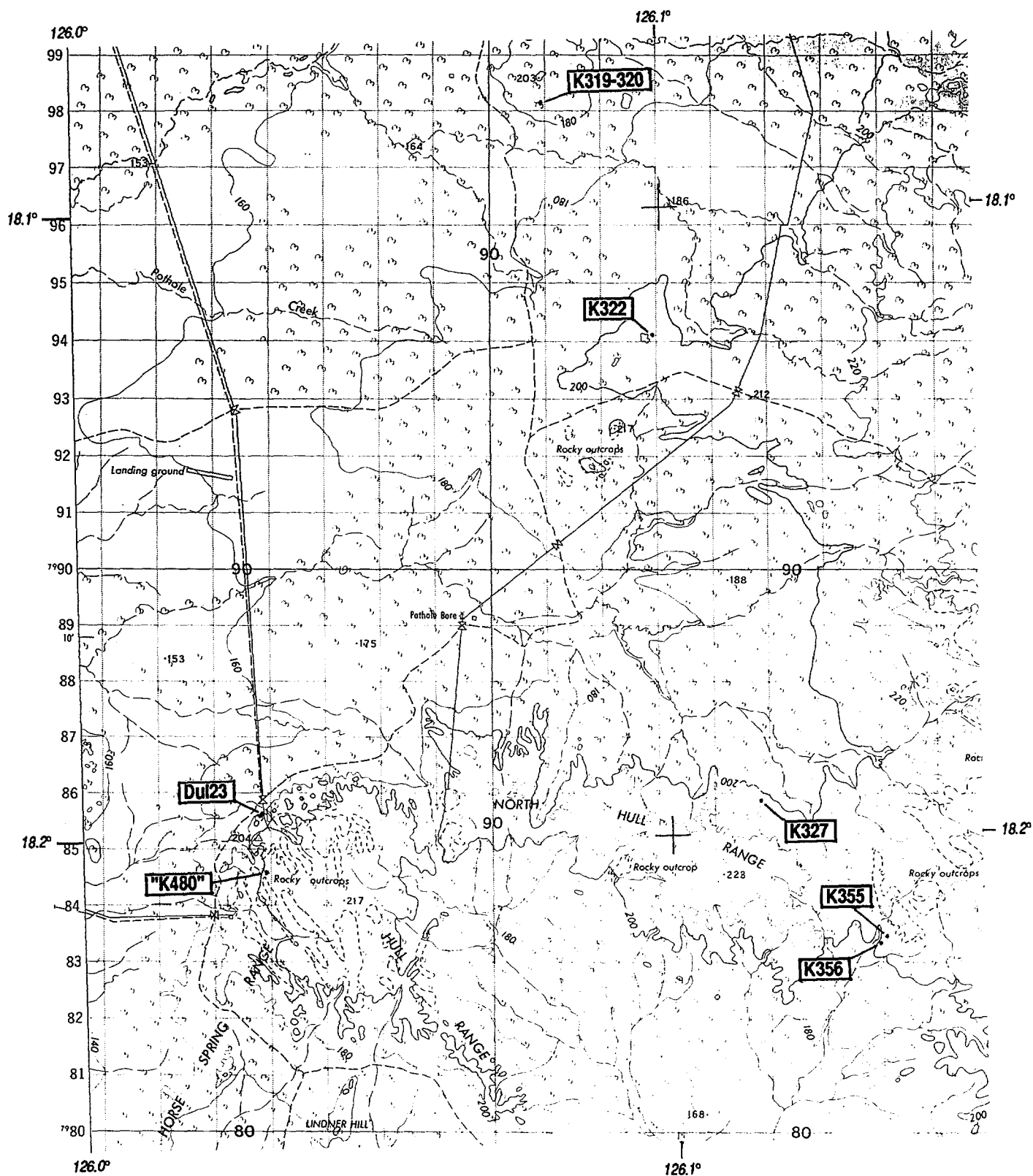


Figure 5: Localities in and north of the North Hull Range, northwestern ELMA 1:100,000 sheet.

K320 (section DF3, level A2): at the same point as K319, but 10.7 m (35 ft) above the base of the Fairfield Beds.

AE <sup>1</sup>9091.<sup>79</sup>9816; 18.0835°S, 126.0801°E

K322 (Duf1): "Southern Burrumundi Range", Run 2A, photo D5306, coordinates A/1.76/2.65/3.18.

About 150 m northeast of the top of a low rise, 2.2 km east of the track north from the Hull Range to Sadlers Yard east of the head of Pothole Creek, southwest of the Baramundi Range.

AE <sup>1</sup>9293.<sup>79</sup>9411; 18.1198°S, 126.0986°E

K327 (Duf3): "Northern Hull Range", Run 3, photo A5584, coordinates A/0.58/1.28/1.40.

On the north flank of the North Hull Range, 6.2 km east-southeast of Pothole Bore.

AE <sup>1</sup>9482.<sup>79</sup>8589; 18.1947°S, 126.1134°E

K355 (KDud355): "Eastern Hull Range", Run 3, photo A5585, coordinates given as D/1.36/0.36/1.40 but photo quadrant actually C.

On the south flank of the North Hull Range about 4 km west-northwest of Rattigan Rocks.

AE <sup>1</sup>9711.<sup>79</sup>8346; 18.2168°S, 126.1362°E

K356 (KDud356): "Eastern Hull Range", Run 3, photo A5585, coordinates given as D/1.42/0.46/1.50 but photo quadrant actually C.

On the south flank of the North Hull Range about 4 km west-northwest of Rattigan Rocks, 200 m southwest of K355.

AE <sup>1</sup>9697.<sup>79</sup>8337; 18.2178°S, 126.1349°E

K480 (Dul23?): "Horse Spring area", Run 3, photo A5583, coordinates given as C/0.44/2.84/2.88. No point is at this position on the photo, but precisely symmetrical about the horizontal axis, in quadrant C, is a point marked Dul 23. In view of the other errors with the Elma photos, I assume this is the correct position, but both are plotted on the map.

Dul 23: about 250 m south of the gate at the junction of tracks northeast to pothole Bore and north to Boabab Bore, at the foot of the scarp where Horse Spring Range, Hull Range and North Hull Range run together, at the northwest end of Hull Range.

AE <sup>1</sup>8588.<sup>79</sup>8562; 18.1955°S, 126.0305°E

"K480" as plotted from the published photo coordinates is 1 km further south, again at the foot of the scarp, 1 km northeast of the unnamed tank which is probably Horse Spring.

AE <sup>1</sup>8589.<sup>79</sup>8457; 18.2051°S, 126.0309°E

#### ELMA 1:100,000 SHEET - NORTH-CENTRAL LOCALITIES -- FIGURE 6

Photos: Mount Ramsay 1:250,000 sheet.

K287 (= K288): "South of Burrumundi Range", Run 2, photo A5571, coordinates A/0.98/1.80/2.06.

100 m north of a gully on the eastern side of the broad saddle between the northern Horseshoe Range and the southeastern Baramundi Range, about 4 km west of the Leopold River.

BE <sup>2</sup>0331.<sup>79</sup>9500; 18.1132°S, 126.1965°E

K289 (section DF2, level A1): "South of Burrumundi Range (Base of Fairfield Beds ..)", Run 2, photo A5571, coordinates A/1.09/2.64/2.88.

Near the head of a gully on the eastern side of the broad saddle between the northern Horseshoe Range and the southeastern Baramundi Range, about 4 km west of the Leopold River. The course and extent of section DF2 is unclear on the photo.

BE <sup>2</sup>0234.<sup>79</sup>9481; 18.1155°S, 126.1877°E

K290 (section DF2, level A2): "South of Burrumundi Range (100' [30.4 m] above base of Fairfield Beds ..)", Run 2, photo A5571, coordinates referred to K289.

As K289, but about 300 m downstream.

BE <sup>2</sup>0265.<sup>79</sup>9481; 18.1147°S, 126.1908°E

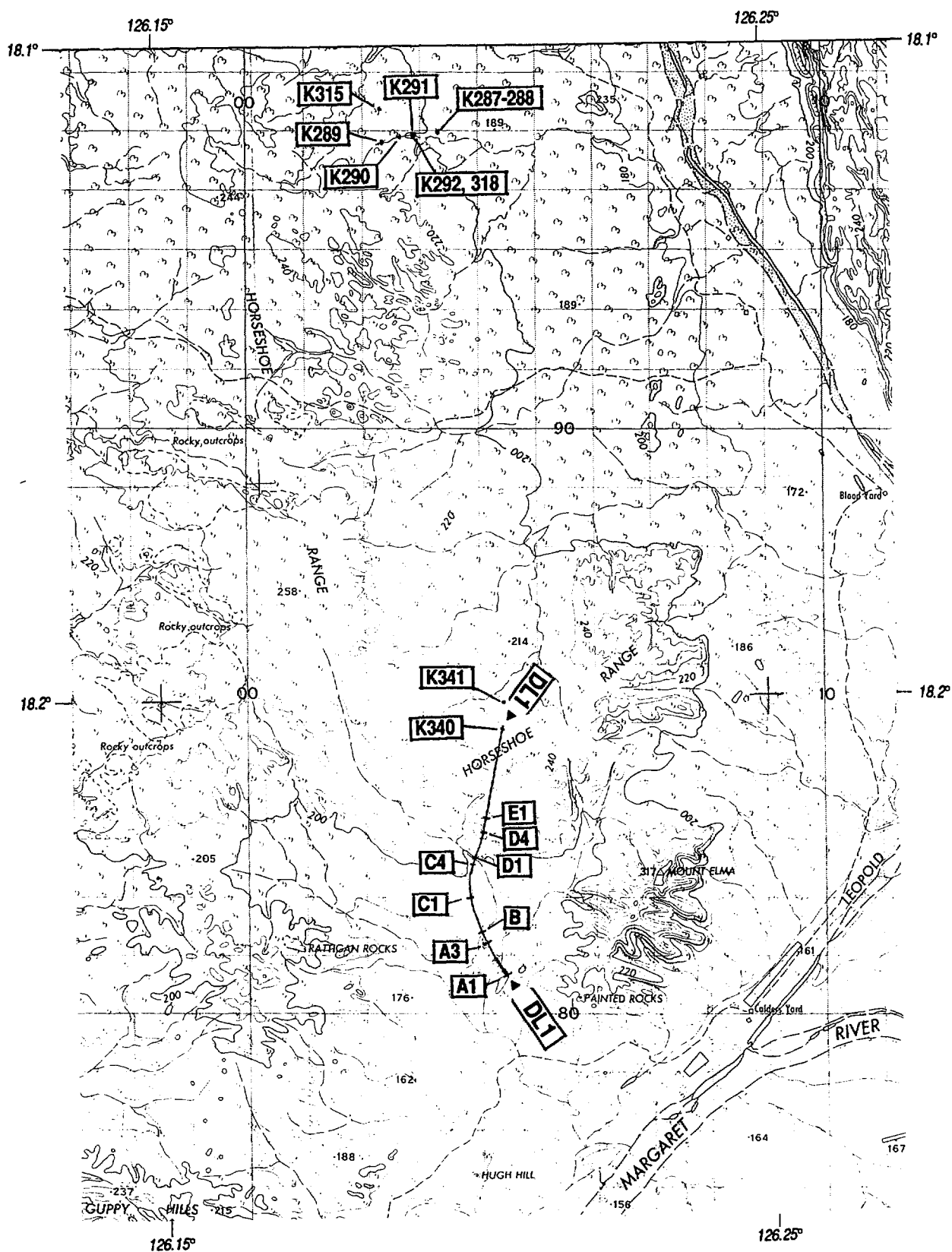


Figure 6: Localities in the Horseshoe Range, north-central ELMA 1:100,000 sheet.

K291 (section DF2, level A3): As K290, but 54.9 m (180 ft) above the base of the Fairfield Beds, and another 200 m downstream.

BE <sup>2</sup>0285.<sup>79</sup>9492; 18.1140°S, 126.1928°E

K292 (section DF2, level A4; approximately = K318): As K291, but 57.9 m (190 ft) above the base of the Fairfield Beds, and about 100 m downstream.

BE <sup>2</sup>0287.<sup>79</sup>9492; 18.1140°S, 126.1929°E

K315 (section DL2, level E1): "South of Burramundi Range (100' [30.4 m] above base of Fairfield Beds ..)", Run 2, photo A5572, coordinates referred to base of section DL2 at C/0.07/0.48/0.49.

The section runs northwest from the gully followed by section DF2, towards the Baramundi Range. The position of E1 is not specifically marked, and so is estimated from height in section, relative to E3 which is marked.

BE <sup>2</sup>023.<sup>79</sup>9535; 18.1105°S, 126.1879°E

K318 (section DL2, level E3): As K315 but 96 m (315 ft) above the base of the Fairfield Beds. The published photo reference is to Run 2, photo A5571, coordinates A/1.02/2.17/2.40.

Photo A5571 has an unlabelled hole pricked at the appropriate place, but photo A5572 has a point labelled DL2E3 which is at a different position, more clearly related to the section line. This is in approximately the same position as K292, which however is given as 190 ft above the Fairfield base! If K318 is the same as DL2,E3 then its coordinates are as for K292, but the stratigraphic position of both is somewhat uncertain.

**Section DL1** -- The photo reference was not published, but section DL1 is on photo A5587, Run 3. The section extends approximately northwards about 3 km west of Mount Etna, across the crest of the southern end of the Horseshoe Range. Levels E1 and E4, but not E3, are pricked on the photo, so the position on the section line is only approximate.

K340 (level E3): photo reference not quoted; 61 m above the base of the Fairfield Beds, and E4 67.1 m up.

BE <sup>2</sup>044.<sup>79</sup>850; 18.2045°S, 126.2044°E

K341 (level E4): Run 3, photo A5587, coordinates given as D/0.15/0.96/0.98. These coordinates are for a point along the section line, but a little beyond the point marked as section top E4. The quoted point is plotted on the map, its coordinates given here.

BE <sup>2</sup>0443.<sup>79</sup>8533; 18.2007°S, 126.2060°E

T9: "Limestone above Long Hole Conglomerate". On Teichert's published map, about 3 miles east of Long Hole Bore, at the northwestern end of the Burramundi Range. The locality cannot be positioned with any accuracy, but from Playford & Lowry's map (Plate 3) is most likely the outcrop of Pillara Limestone 4.5 to 5 km east-southeast of the bore, at approximately AE <sup>1</sup>920.<sup>80</sup>060. This is in the extreme northwest corner of the sheet, and is not illustrated.

## **FITZROY CROSSING 1:100,000 SHEET - PILLARA RANGE & MT PIERRE LOCALITIES - FIGURE 7**

Photos: Noonkanbah 1:250,000 sheet.

In the Mount Pierre area north of the Pillara Range there are some points of geographic nomenclature needing clarification, especially because they involve the location of early collections.

1) On Playford & Lowry's map (Plate 4), which follows Teichert's map (Plate 1), the broad hill northwest of Mount Pierre is labelled Needle Eye Rocks. On the Fitzroy Crossing sheet this hill is unnamed.

2) Similarly, the pinnacle east of the Margaret River north-northeast of Mount Pierre is labelled Fossil Hill by Teichert etc. On the Fitzroy Crossing sheet, it is this pinnacle which is labelled Needle Eye Rock.

**Section DD3** -- Run 6, photo 5766, coordinates quoted for base of section as A/0.19/1.92/1.94. The section lies 2.5 km southeast of Menyous Gap, and extends northeast from the crest of the Pillara Range for about 1¼ km. Levels plotted on the photo are A1, B1, C1, F1 and section top; A1 is at ZV <sup>8</sup>0193.<sup>79</sup>6182, F1 is at ZV

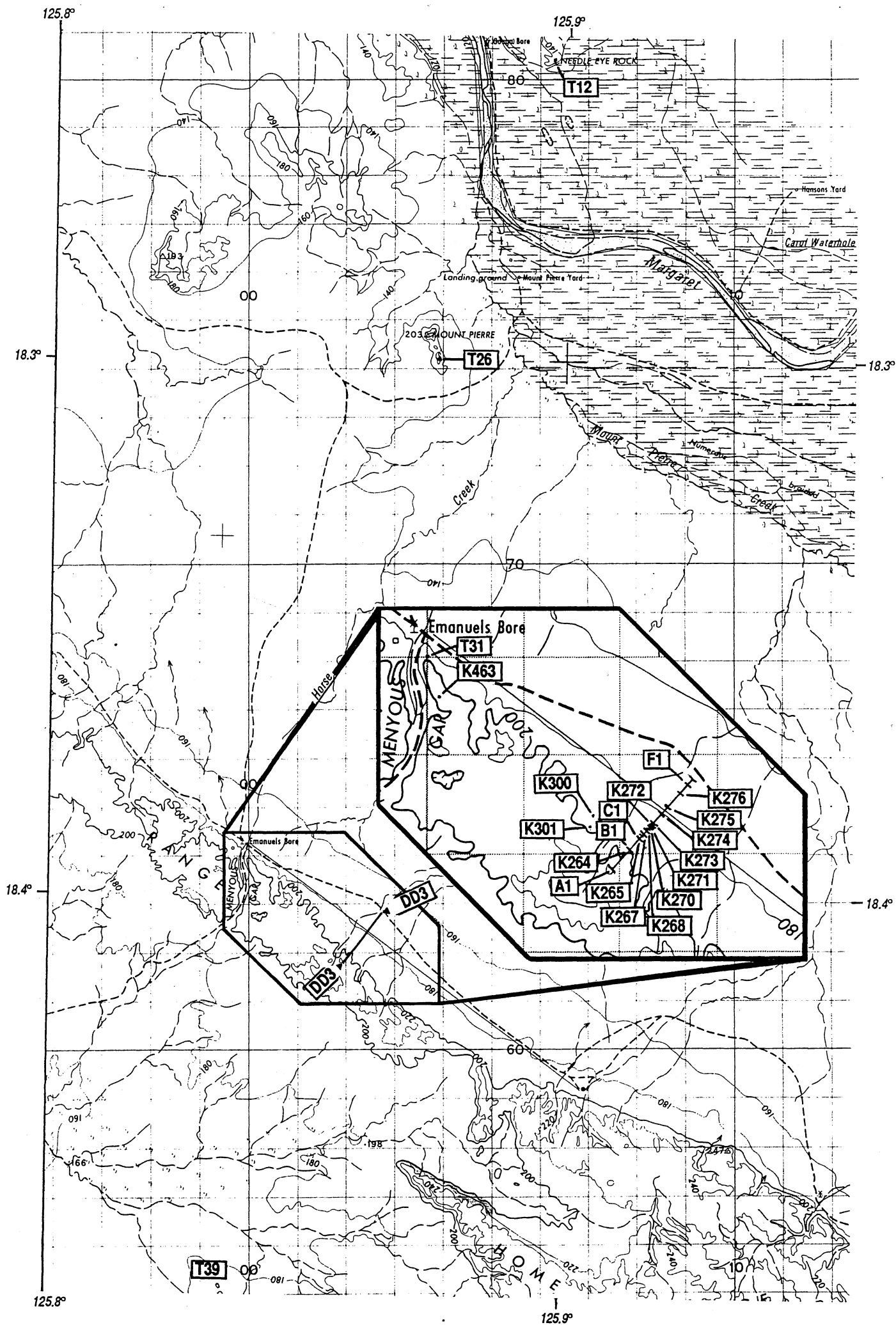


Figure 7: Localities in the Pillara Range and Mount Pierre areas, FITZROY CROSSING 1:100,000 sheet; inset - area southeast of Emanuel's Bore at 1:50,000.

<sup>8</sup>0268.<sup>79</sup>6268. The remaining localities are plotted on the basis of height above section base; levels between C1 and F are plotted on the assumption (based on examination of the photo) of fairly uniform topography and no structural complications.

K264 ( level B1): 15.2 m above the Pillara Limestone (i.e. above level A1).

ZV <sup>8</sup>0211.<sup>79</sup>6206; 18.4099°S, 125.8593°E

K265 (level C1): 36.6 m (120 ft) above the Pillara Limestone.

ZV <sup>8</sup>0222.<sup>79</sup>6217; 18.4088°S, 125.8603°E

K266 (level C2): 45.7 m (150 ft) above the Pillara Limestone.

ZV <sup>8</sup>0224.<sup>79</sup>6219; 18.4087°S, 125.8606°E

K267 (level C3): 50.3 m (165 ft) above the Pillara Limestone.

ZV <sup>8</sup>0226.<sup>79</sup>6221; 18.4086°S, 125.8608°E

K268 (level C4): 61.0 m (200 ft) above the Pillara Limestone.

ZV <sup>8</sup>0228.<sup>79</sup>6223; 18.4082°S, 125.8611°E

K269 (level C5): 64.0 m (210 ft) above the Pillara Limestone.

ZV <sup>8</sup>0229.<sup>79</sup>6224; 18.4081.7°S, 125.8612°E

K270 (level C6): 68.6 m (225 ft) above the Pillara Limestone.

ZV <sup>8</sup>0230.<sup>79</sup>6225; 18.4080°S, 125.8614°E

K271 (level C7): 71.6 m (235 ft) above the Pillara Limestone.

ZV <sup>8</sup>0232.<sup>79</sup>6227; 18.4079°S, 125.8615°E

K272 (level C8): 76.2 m (250 ft) above the Pillara Limestone.

ZV <sup>8</sup>0234.<sup>79</sup>6229; 18.4078°S, 125.8616°E

K273 (level D2): 79.2 m (260 ft) above the Pillara Limestone.

ZV <sup>8</sup>0235.<sup>79</sup>6230; 18.4078°S, 125.8617°E

K274 (level D3): 108.2 m (355 ft) above the Pillara Limestone.

ZV <sup>8</sup>0242.<sup>79</sup>6238; 18.4068°S, 125.8625°E

K275 (level E2): 126.5 m (415 ft) above the Pillara Limestone.

ZV <sup>8</sup>0250.<sup>79</sup>6246; 18.4061°S, 125.8631°E

K276 (level E4): 134.1 m (440 ft) above the Pillara Limestone.

ZV <sup>8</sup>0262.<sup>79</sup>6258; 18.4051°S, 125.8643°E

K300 (KDud300): "Pillara Spring area", Run 6, photo 5766, coordinates B/0.28/2.06/2.08.

About 400 m northeast of the crest of the Pillara Range, 2.7 km southeast of Emanuels Bore (at the north end of Menyous Gap), and 500 m northwest of Section DD3.

ZV <sup>8</sup>0172.<sup>79</sup>6239; 18.4071°S, 125.8558°E

K301 (KDud301): "Pillara Spring area", Run 6, photo 5766, coordinates B/0.19/2.12/2.14.

About 120 m south-southwest of K300.

ZV <sup>8</sup>0170.<sup>79</sup>6228; 18.4081°S, 125.8556°E

K438 (Dmp61?): No details listed; Run 7, photo 5759, coordinates quoted as C/3.32/0.08/3.33.

The photo has no point pricked at these coordinates, but symmetric to the quoted point in quadrant D is a pricked point Dmp61 which is probably K438. It is close to both photo and map margins, so difficult to plot accurately. It is not shown in Fig. 7, but is on the edge of a scarp on the west side of a spur joining the Virgin Hills to the Home Range, and is probably at or close to the Trig. Station,



height 254 m. The coordinates for the trig. station are ZV <sup>8</sup>0755.<sup>79</sup>5215 (18.4986°S, 125.9121°E). The correctness of this position is made more likely by the position quoted by Hill & Jell (1970) -- 2.5 miles at 136° from Mountain Home Spring, which falls very close to the trig station.

K463 (section DMP1, level A11): "Menyous Gap (1,150' [350.5 m] above base of type section of Pillara Formation)", Run 6, photo 5766, coordinates B/1.24/3.30/3.52.

Near the northern end of the crest of the ridge forming the eastern side of Menyous Gap, 730 m south-southeast of Emanuels Bore -- section DMP1 was measured along the low cliff forming the eastern side of the Gap.

ZV <sup>8</sup>0014.<sup>79</sup>6360; 18.3964°S, 125.8408°E

T11: "...N. of Margaret River, W. of Fossil Hill, 1.2 miles from Fossil Hill Camp"; the position is only approximate, but is on the west side of the pinnacle named Needle Eye Rock on the Fitzroy Crossing sheet, at approximately ZV <sup>8</sup>060.<sup>79</sup>805. Not illustrated.

T12: "Top of Fossil Hill". The top of the pinnacle labelled on the Fitzroy Crossing sheet as Needle Eye Rock.

ZV <sup>8</sup>0630.<sup>79</sup>8040; 18.2439°S, 125.8965°E

T18: "10-21 ft. below base of LS conglomerate, S.E. corner Needleeye Rocks". On the southeastern slope of the now unnamed hill, about 2.5 km northwest of Mount Pierre, at approximately ZV <sup>8</sup>025.<sup>79</sup>765. Not illustrated.

T19: "1.55 miles N. of Mt. Pierre Camp". The camp is not shown on any map, so this locality can be placed other than in the general Mount Pierre area. Not illustrated.

T25: This encompasses 6 separate collections, A24 to A30, variously labelled "{Top of} Mt. Pierre", "Eastern slope of Mt. Pierre". They cannot be separately plotted. All lie in the vicinity of ZV <sup>8</sup>040.<sup>79</sup>745. Not illustrated.

T26: "... second hill east of Mt. Pierre Trig.". The Margaret River floodplain covers an extensive area east of Mount Pierre, but there are two peaks on the ridge extending south from Mount Pierre trig. station, and it is assumed the more southerly of these is meant.

ZV <sup>8</sup>0390.<sup>79</sup>7420; 18.3000°S, 125.8748°E

T27: "... S.E. part of S.-Hill" - noted in Veevers' text to be in the Mt Pierre area. This locality cannot be positioned with any certainty. Not illustrated.

T31: "Northern entrance of Minyu Gap, Rough Range" (Teichert, 1949; not listed by Veevers). The locality is on the east side of the northern end of Menyous Gap, Pillara Range. The locality cannot be placed accurately.

ZV <sup>8</sup>00.<sup>79</sup>64

T39: "Little hill in N.W. extension of northernmost of the limestone ridges of the S.E. Rough Range, N.E. of No. 3 Bore". It is presumed that this is the low double hill about 3 km northeast of No. 3 outcamp, at the northwestern end of the Virgin Hills.

YV <sup>8</sup>994.<sup>79</sup>551; 18.473°S, 125.840°E

T40: "Section through N.W. part of northernmost of the limestone ridges of the S.E. Rough Range, N.E. of No. 3 Bore". This must be near T39 (which see), but cannot be reliably positioned. Not illustrated.

**FITZROY CROSSING 1:100,000 SHEET - GEIKIE HILL & "FOSSIL DOWNS" -- FIGURE 8**

Photos: Noonkanbah 1:250,000 sheet.

K285 (KDuf285): "Fossil Downs Homestead, near tennis courts", no photo coordinates published, and position not located on photos.

About 200 m northwest of the road, about 1 km northeast of the homestead. Position approximate.  
YV 7943.79928; 18.133°S, 125.781°E

K506 (KDus506; section DS2, level A3): "3.5 miles east of Springs Homestead ... (750' [228.6 m] above base of section)", Run 2, photo A5024, coordinates given as D/1.68/0.15/1.70 but point is marked in photo quadrant C.

Beside the track on the northern side of the Fitzroy River south-southeast of Geikie Hill, opposite the northeastern mouth of the Margaret River, about 70 m southeast of a creek crossing.

YV 78508.79575; 18.1075°S, 125.6939°E

T5: ".. just behind crest of scarp behind Fossil Downs Homestead"; this is in the vicinity of K285 (which see), but cannot be positioned with any accuracy. It is not shown on Fig. 8.

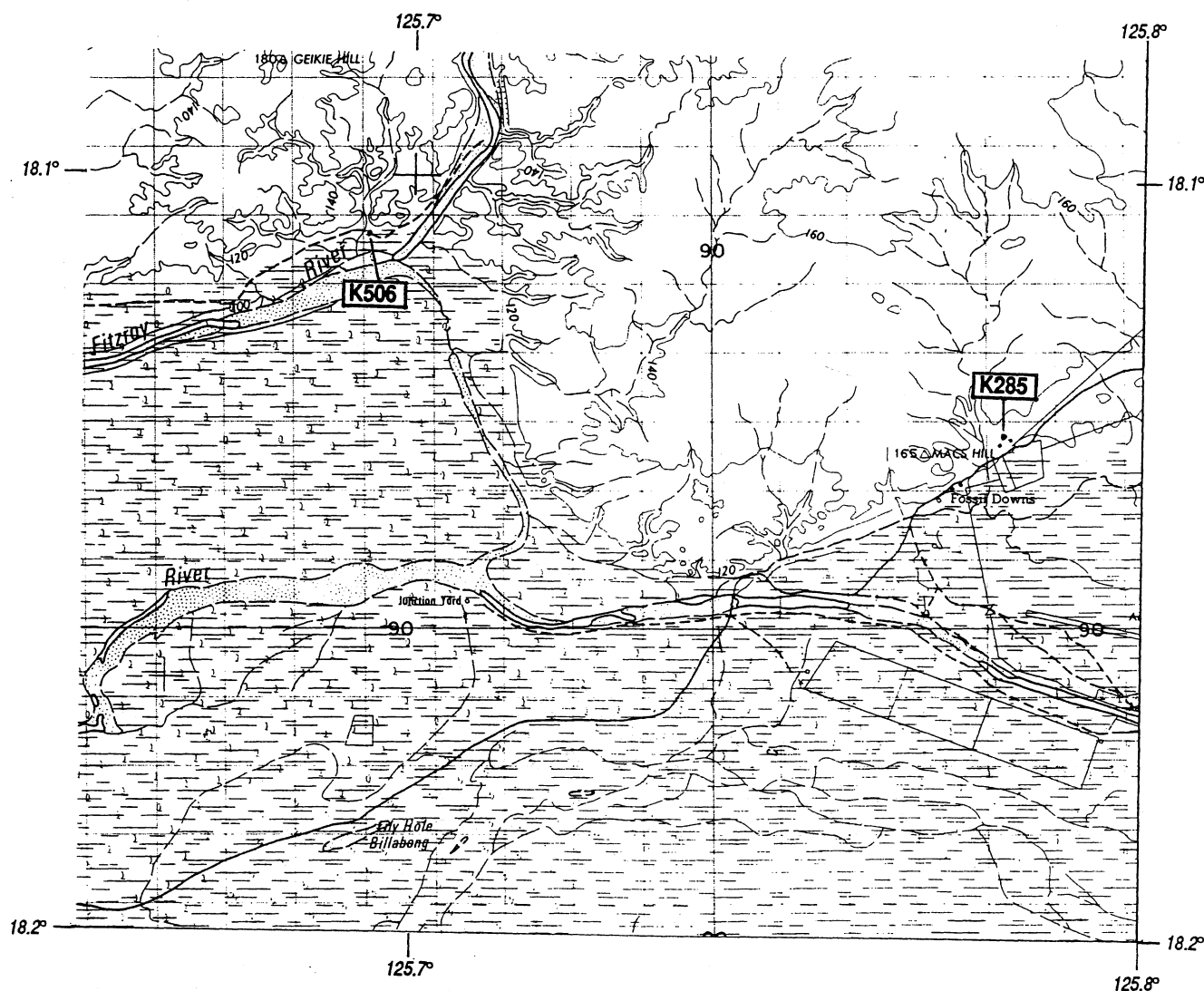
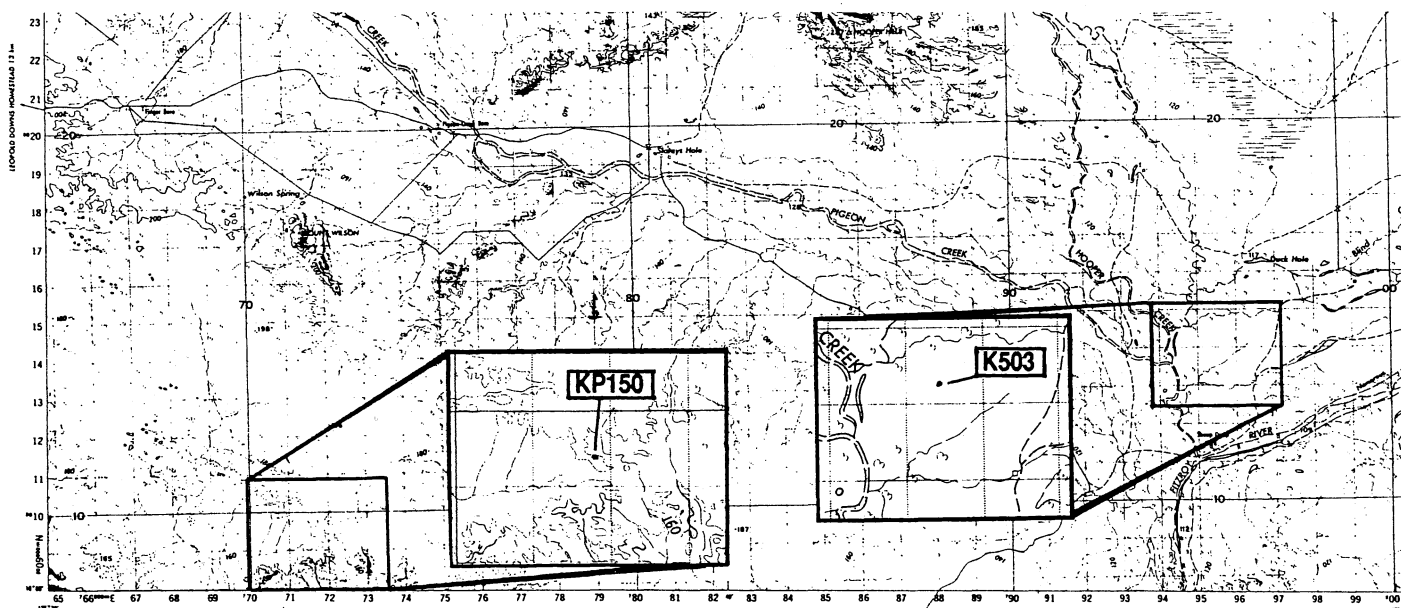


Figure 8: Localities near "Fossil Downs" and Geikie Hill, FITZROY CROSSING 1:100,000.



**Figure 9:** Localities in the Hooper Creek - Mount Wilson region, HOOPER 1:100,000 sheet, at 1:200,000 with insets of the immediate locality areas at 1:100,000.

**HOOPER 1:100,000 SHEET -- FIGURE 9**

Photo: Lennard River 1:250,000 sheet.

**K503 (KDu503):** "Geikie Gap area", Run 15, photo 5136, coordinates D/1.82/2.08/2.76.

2.9 km north of Sheep Camp Yard near the junction of Pigeon Creek with the Fitzroy River, and 1.3 km northeast of the junction of Hooper Creek with Pigeon Creek.

YA 79543.<sup>80</sup>1426; 17.9408°S, 125.7891°E

**T1:** "Brooking Gap Section". Brooking Gap is marked on Playford & Lowry's map, and is quite long. It is not labelled on the Hooper Sheet. The locality will be about 8 km south of Mount Wilson, but cannot be closely positioned. Not illustrated.

**KP150:** "just W. of S. entrance to Brooking Gap from reef series" - 17° 59.2', 125° 34.0'. 8 km south of Mount Wilson, on the side of a low ridge west of a small creek.

YA 718.<sup>80</sup>094; 17.9867°S, 125.5667°E

**LENNARD 1:100,000 SHEET - NAPIER & VAN EMMERICK RANGES AREA -- FIGURE 10**

Photos: Lennard River 1:250,000 sheet.

**Section Dmp5** -- Lennard River photos, Run 3, photo 5089. The section runs westward from the bluff north of the creek at the eastern end of Wagon Pass, Napier Range 11 km northwest of the old "Napier Downs" homestead near Barker Gorge, and ends about ½ km east of the crest, still on the north side of the pass. Plotted on the photo are levels A1, C2, C3, D1 and D2 (top). The base of the section (A1) is at photo coordinates B/0.72/1.04/1.26.

K571 (level C2): "Eastern entrance of Old Wagon Track, Napier Downs ... (280' [85.3 m] above base of section Dmp5)".

At the eastern edge of the bluff.

XB 67689.<sup>81</sup>0014; 17.1766°S, 124.6632°E

K572 (level C2; = K571): see K571; the two localities are not labelled as such on the photo, and it is assumed that they are effectively identical.

XB 67689.<sup>81</sup>0014; 17.1766°S, 124.6632°E

K573 (level C3): equated by Veevers with K571, 572, yet shown as level C3; there are two pricked points on the photo labelled C2, none labelled C3, so it is assumed that the one furthest from A1 is actually C3. This point is on the southern edge of the bluff.

XB 67677.<sup>81</sup>0004; 17.1776°S, 124.6620°E

F29: 17° 05.2' S, 124° 37.0'E. In the shallow valley southwest of the Van Emmerick Range, 8 km southeast of Billy More Yard.

XB 6720.<sup>81</sup>102; 17.0867°S, 124.6167°E

F32: 17° 04.8', 124° 37.2'. About 750 m north-northeast of F29.

XB 6723.<sup>81</sup>109; 17.0800°S, 124.6200°E

F33: 17° 04.7', 124° 36.0'. 2.1 km west-northwest of F29.

XB 6702.<sup>81</sup>111; 17.0783°S, 124.6000°E

F34: 17° 13.4', 124° 37.1'. On the track along the foot of the Chedda Cliffs, 5.5 km south-southeast of the ruins, unnamed on the Lennard sheet but labelled as "Old Napier Downs" on the older maps ("Old Napier Downs" on the Lennard sheet is labelled simply "Napier Downs" on the others, which show nothing at the present site of the homestead - it has obviously been moved twice!).

XA 6721.<sup>80</sup>950; 17.2233°S, 124.6183°E

M2: "Station Creek, (Old) Napier Downs Homestead" - 17° 10.2', 124° 34.8'. On the north side of Station Creek 2 km west-northwest of the ruins of the original "Napier Downs".

XB 6680.<sup>81</sup>009; 17.1700°S, 124.5800°E

M3: "Station Creek, (Old) Napier Downs Homestead" - 17° 10.3', 124° 34.2'. On the north side of Station Creek 3 km west-northwest of the ruins of the original "Napier Downs".

XB 6670.<sup>81</sup>008; 17.1700°S, 124.5800°E

M8: "Station Creek about 5 miles from (Old) Napier Downs Homestead" - 17° 11.8', 124° 32.0'. Station Creek 7.3 km west-southwest of the ruins of the original "Napier Downs", 3 km east of Halfway Bore.

XB 6631.<sup>80</sup>980; 17.1967°S, 124.5333°E

M9: "Station Creek about 5 miles from (Old) Napier Downs Homestead" - 17° 12.0', 124° 31.8'. Station Creek 7.8 km west-southwest of the ruins of the original "Napier Downs", 2.7 km east of Halfway Bore.

XB 6628.<sup>80</sup>976; 17.2000°S, 124.5300°E

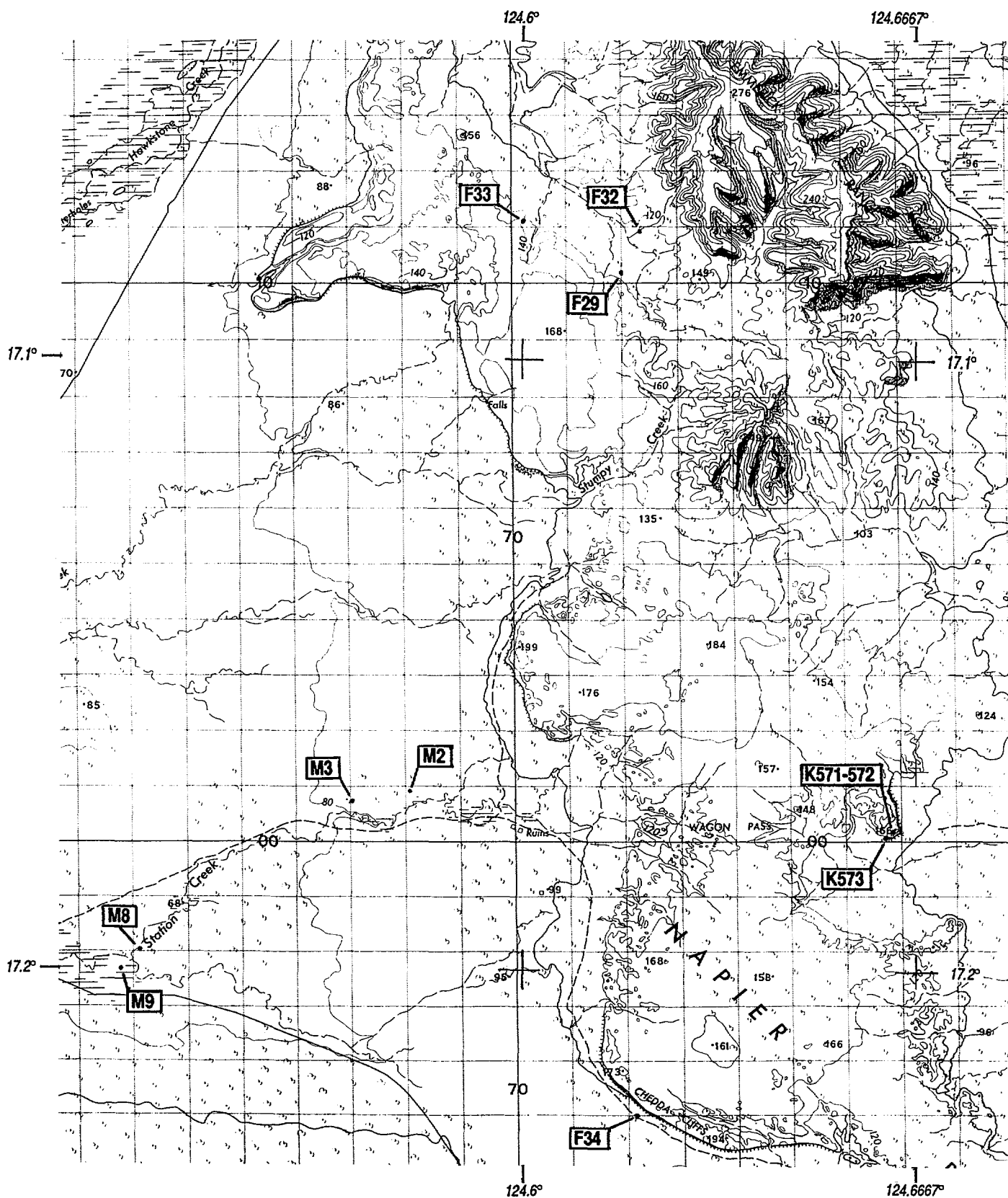


Figure 10: Localities in the Napier and Van Emmerick Ranges region, LENNARD 1:100,000 sheet. Note that the unnamed ruins near the head of Station Creek are those of the "Old Napier Downs" homestead of Veevers (1959) and Playford & Lowry (1966).

**LENNARD 1:100,000 SHEET - WINDJANA GORGE AREA -- FIGURE 11**

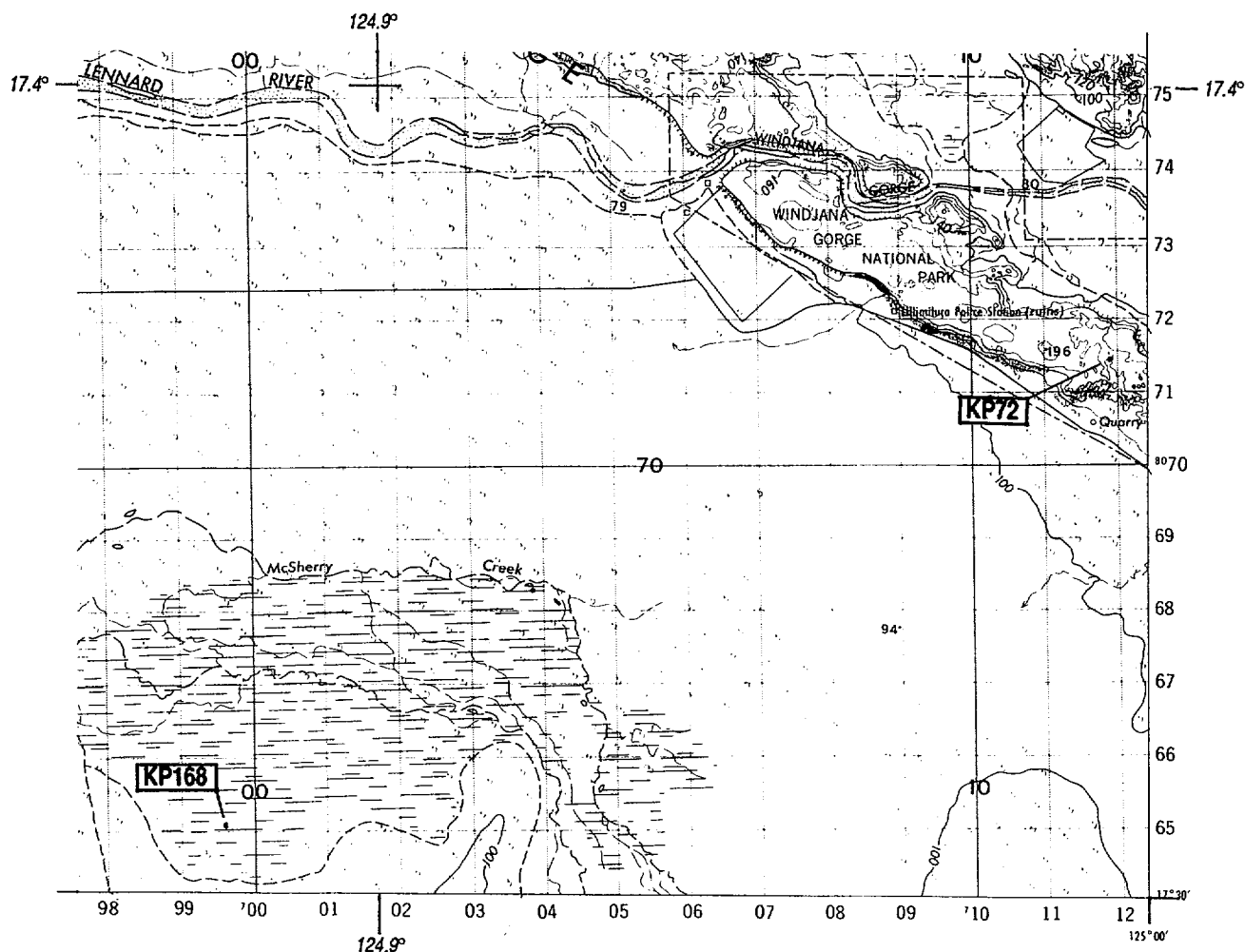
Photos: Lennard River 1:250,000 sheet.

**KP72:**  $17^{\circ} 26.0'$ ,  $124^{\circ} 59.7'$ . About 800 m north of a quarry north of the road southeast from Windjana Gorge, 3.1 km east-southeast of the ruins of Lillimilura Police Station.

YA  $7119.80714$ ;  $17.4333^{\circ}\text{S}$ ,  $124.9950^{\circ}\text{E}$

**KP168:**  $17^{\circ} 29.5'$ ,  $124^{\circ} 52.8'$ . This lies on the flood-plain of Mount North Creek about 7 km east of Mount North, leading to the suspicion that the coordinates may not be correct.

YA  $6996.80651$ ;  $17.4917^{\circ}\text{S}$ ,  $124.8800^{\circ}\text{E}$



**Figure 11:** Localities near Windjana Gorge, LENNARD 1:100,000 sheet.

**LEOPOLD DOWNS 1:100,000 SHEET - SOUTHEAST OSCAR RANGE -- FIGURE 12**

Photos: Lennard River 1:250,000 sheet.

**K539** (section DO1, level A1): "Linesmans Creek (110' [33.5 m] above base of type section of Oscar Formation)"; Run 15, photo 5150, coordinates B/2.54/2.19/3.36.

From the photo coordinates, K539 lies about 350 m northeast of Linesman Creek where it starts to cut through the southwestern ridge of the Oscar Range, at:

YA  $73785.802105$  =  $17.8853^{\circ}\text{S}$ ,  $125.2441^{\circ}\text{E}$ .

No point is pricked into the air-photo at this point. However, levels A and B4 of section DO1 are pricked into the photo, and lie a similar distance southeast of Linesman Creek. DO1,A is at:

YA  $73827.802053$  =  $17.8904^{\circ}\text{S}$ ,  $125.2485^{\circ}\text{E}$ .

The two points are more or less on strike; both are plotted, as is DO1,B4.

KP152: "On plain 4 miles NW of Leopold Downs Station from rock debris on plain surface" -  $17^{\circ} 49.7'$ ,  $125^{\circ} 23.9'$ . The coordinates place this on the track north from Four Mile Bore to Big Spring Bore, about 600 m north of the track junction at the former, and 5.5 km north-northwest from "Leopold Downs" - Teichert's distance is probably the road distance.

YA  $7542.80272$ ;  $17.8283^{\circ}\text{S}$ ,  $125.3983^{\circ}\text{E}$

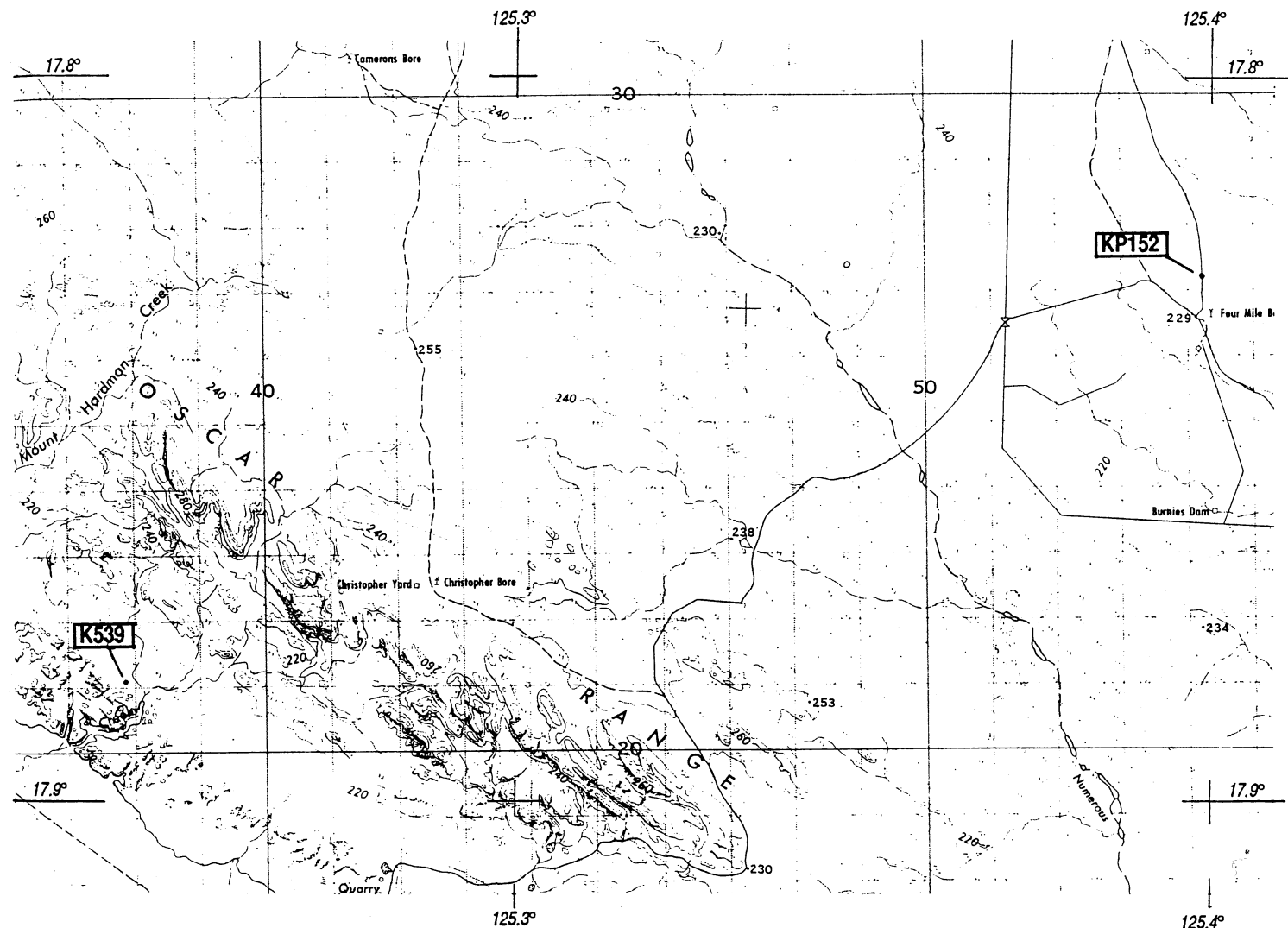


Figure 12: Localities on Linesman Creek (Oscar Range) and at Four Mile Bore, LEOPOLD DOWNS 1:100,000 sheet.

#### LEOPOLD DOWNS 1:100,000 SHEET - EASTERN OSCAR PLATEAU & UPPER FAIRFIELD VALLEY -- FIGURE 13

The photos (Lennard River 1:250,000 sheet) were not available. All the WAPET localities have been transferred from the copy of the locality map held by BMR via the map published by Playford & Lowry (1956), which has the same 10,000 yd grid.

Ld28: "Data not supplied".

In the upper Fairfield Valley, about 150 m south of Chestnut Creek north of a hill detached from the north edge of the Oscar Plateau, 4.3 km east-northeast of Wine Spring.

YA  $7312.80428$ ;  $17.6900^{\circ}\text{S}$ ,  $125.1782^{\circ}\text{E}$

Ld29: "Data not supplied".

Near the dissected northeastern edge of the Plateau south of the headwaters of Chestnut Creek, 5.7 km southeast of Wine Spring.

YA 7307.<sup>80</sup>372; 17.7402°S, 125.1743°E

Ld32: "Data not supplied".

Upper Fairfield Valley at the foot of the slope down from the Oscar Plateau, about 800 m east of a tank near a bend in the track, and about 1.5 km northeast of Wine Spring.

YA 7282.<sup>80</sup>424; 17.6934°S, 125.1503°E

S4/91: Run 13, photo 5066, coordinates A/0.77/1.10/-.

About 200 m northeast of the road east of Stumpy Soak, on the flat ground at the margin of the southwestern slope of the Oscar Range, about 1.8 km southeast of the tank where the road swings southeast from Mount Wynne Creek.

YA 7258.<sup>80</sup>294; 17.8107°S, 125.1302°E

O/76: Photo reference published as Run 11, photo 5072, coordinates B/0.26/0.31/-. However, locality O/77 is quoted as having coordinates nearby, but the two localities are plotted on the WAPET map as being some 11 km apart. In the absence of the photos it is not known which is correctly quoted. On the WAPET map O/76 is near the southwestern edge of the Oscar Plateau above the head of Seven Mile Creek, 5 km south-southwest of Wine Spring.

YA 7249.<sup>80</sup>370; 17.7426°S, 125.1199°E

KP103: 17° 40.5', 125° 11.2'. About 350 m southeast of the track across the upper Fairfield Valley, about 800 m south from where it turns northwest to run between ridges on the northeast side of the valley.

YA 7319.<sup>80</sup>444; 17.6750°S, 125.1867°E

KP106: 17° 42.3', 125° 13.9'. On the east side of a small creek on the north side of the head of Fairfield Valley, 3.2 km southwest of Six Mile Bore.

YA 7367.<sup>80</sup>410; 17.7050°S, 125.2317°E

KP107, KP109: 17° 41.7', 125° 09.1'. About 750 m east-southeast of the yard north of Wine (or Wire) Spring, on the southern side of the upper Fairfield Valley (just south of Ld32). Veevers gives the same coordinates for the two localities, and does not otherwise distinguish them.

YA 7282.<sup>80</sup>423; 17.6950°S, 125.1517°E

KP140: 17° 43.0', 125° 14.0'. Near the head of Chestnut Creek, 4.1 km south-southwest of Six Mile Bore.

YA 7369.<sup>80</sup>398; 17.7167°S, 125.2333°E

KP141: 17° 43.5', 125° 13.2'. About 200 m east of a creek in the headwaters of Chestnut Creek, 8.8 km east of Wine Spring, 1.7 km southwest of KP140.

YA 7354.<sup>80</sup>388; 17.7250°S, 125.2200°E

KP143: 17° 42.5', 125° 11.2'. About 200 m north of a tributary creek of Chestnut Creek, near its head, about 5 km east of Wine Spring.

YA 7319.<sup>80</sup>408; 17.7083°S, 125.1867°E

KP144: 17° 42.2', 125° 11.7'. 5.8 km east of Wine Spring, 1 km east-northeast of KP143, about 700 m southwest of Chestnut Creek.

YA 7327.<sup>80</sup>412; 17.7033°S, 125.1950°E



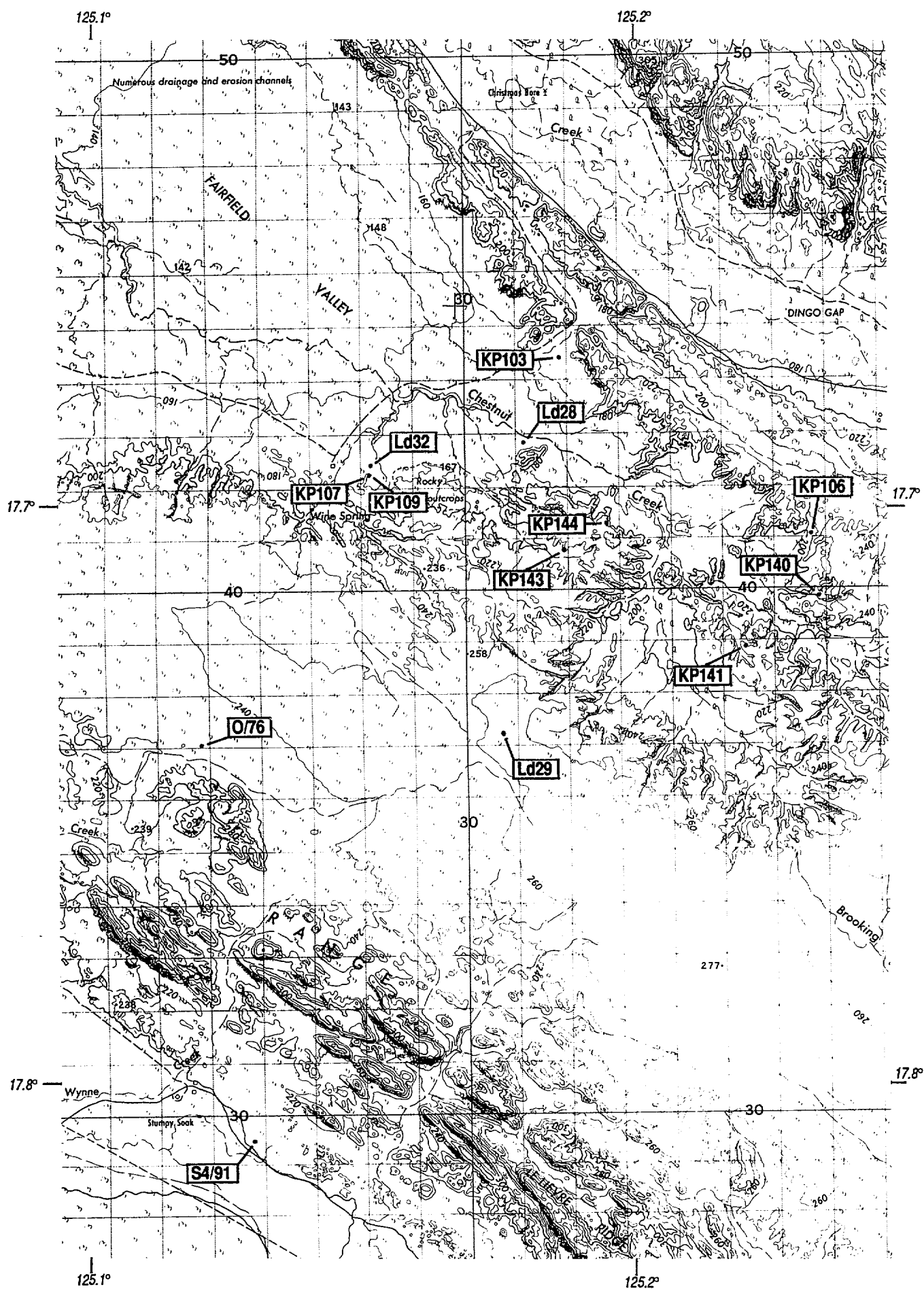


Figure 13: Localities in the upper Fairfield Valley and nearby Oscar Plateau, LEOPOLD DOWNS 1:100,000 sheet.

**LEOPOLD DOWNS 1:100,000 SHEET - WESTERN OSCAR PLATEAU & LOWER FAIRFIELD VALLEY**  
**-- FIGURE 14**

These photos (Lennard River 1:250,000 sheet) were not available. Nearly all the localities are WAPET localities, re-plotted as noted above.

K551 (section DF8, level A1): "1¼ miles [2 km] bearing 037°T from Fairfield Homestead .. (120' [36.6 m] above base of section DF8)"; Run 9, photo 5072, coordinates A/0.05/2.08/2.10.  
 Position, plotted from published bearing, is about 2.5 km west of McSherry Gap and about 700 m east of the road from "Fairfield" to "Napier Downs".

YA 7203.<sup>80</sup>575; 17.558°S, 125.075°E

Ld10: Run 11, photo 5073, coordinates D/2.45/0.08/-.

At the top of the scarp forming the northern edge of the Oscar Plateau, next to a waterfall on a creek flowing north from the Plateau into Chestnut Creek, 3.7 km west-northwest of Elimberrie Spring.

YA 7136.<sup>80</sup>476; 17.6476°S, 125.0133°E

Ld11: Run 11, photo 5073, coordinates D/1.54/0.08/-.

Towards the northern edge of the Oscar Plateau, 1 km south of Ld10 and 3.2 km west of Elimberrie Spring.

YA 7138.<sup>80</sup>466; 17.6570°S, 125.0148°E

Ld16: Run 11, photo 5072, coordinates D/0.31/0.06/-.

About 250 m southwest of the top of the scarp forming the northeastern edge of the Oscar Plateau, about 1.3 km southeast of Elimberrie Spring.

YA 7177.<sup>80</sup>449; 17.6720°S, 125.0521°E

Ld17: Run 11, photo 5072, coordinates A/0.08/0.10/-.

About 400 m west of the top of the scarp forming the northeastern edge of the Oscar Plateau, about 1.6 km south-southeast of Elimberrie Spring.

YA 7177.<sup>80</sup>445; 17.6755°S, 125.0520°E

Ld19: Run 11, photo 5072, coordinates C/0.97/1.60/-.

At the head of a reentrant in the top of the scarp forming the northeastern edge of the Oscar Plateau, about 3.7 km south-southeast of Elimberrie Spring and 1.5 km south of the track along the foot of the scarp.

YA 7197.<sup>80</sup>435; 17.6843°S, 125.0715°E

Ld20: Run 11, photo 5072, coordinates C/1.31/1.14/-.

Between the heads of two reentrants in the top of the scarp forming the northeastern edge of the Oscar Plateau, about 3.6 km southeast of Elimberrie Spring and 1.8 km south of the track along the foot of the scarp.

YA 7193.<sup>80</sup>433; 17.6866°S, 125.0675°E

Ld21: Run 12, photo 5015, coordinates A/1.43/1.04/-.

Towards the southwestern margin of the Oscar Plateau about 500 m northeast of a creek flowing westward off the plateau, and about 3.7 km north of the crossing of Ninety Mile Creek by the track along the southwestern margin of the Oscar Range.

YA 7199.<sup>80</sup>479; 17.7349°S, 125.0739°E

Ld30: Run 11, photo 5072, coordinates B/0.17/0.19/-.

About 600 m southwest of the top of the scarp forming the northeastern edge of the Oscar Plateau, about 1.3 km south-southeast of Elimberrie Spring, 300 m southwest of Ld16.

YA 7174.<sup>80</sup>448; 17.6738°S, 125.0495°E

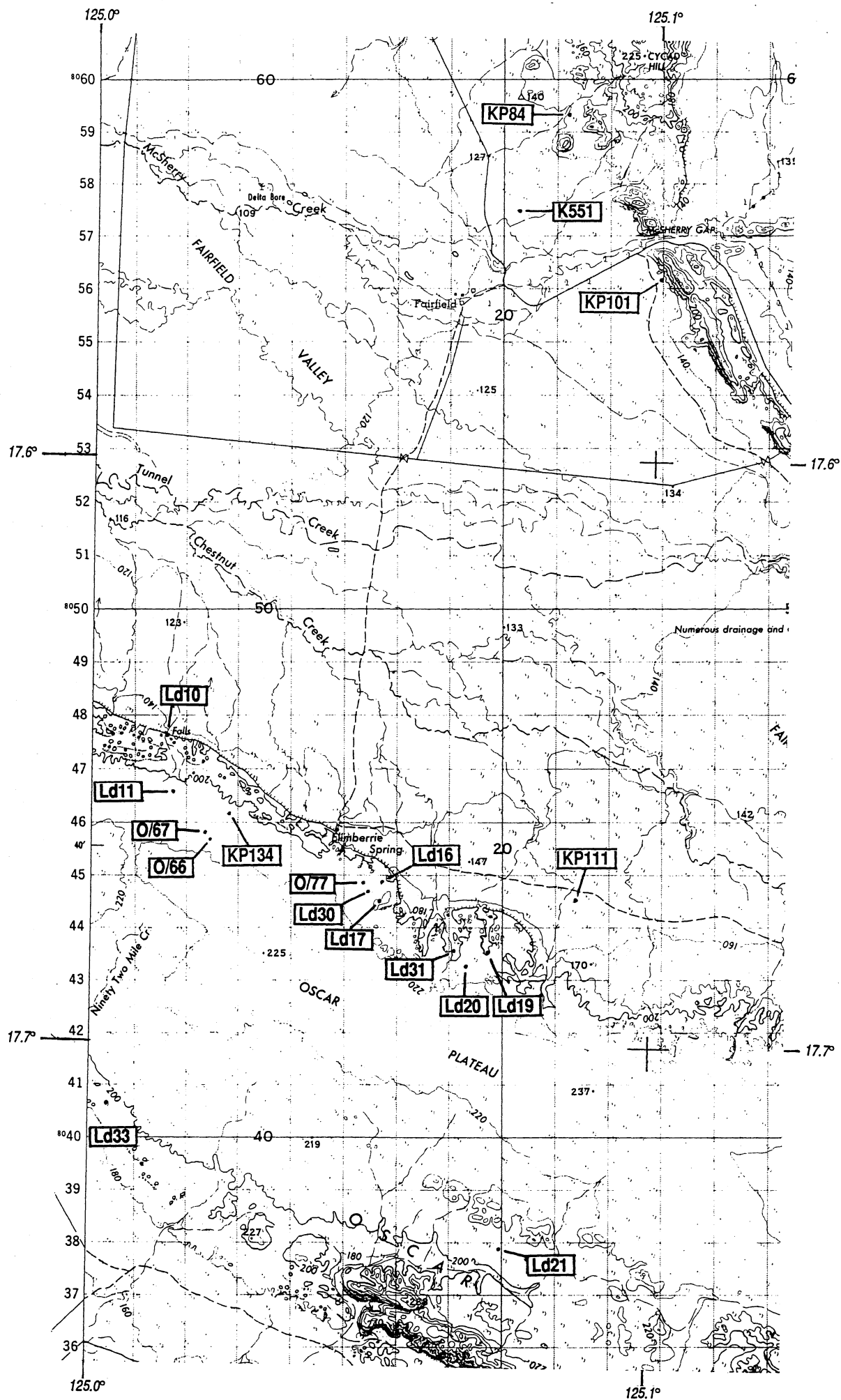


Figure 14: Localities in the Oscar Plateau - "Fairfield" area, LEOPOLD DOWNS 1:100,000 sheet.

Ld31: Run 11, photo 5072, coordinates C/0.94/1.13/-.

Near the head of a reentrant in the top of the scarp forming the northeastern edge of the Oscar Plateau, about 3.2 km southeast of Elimberrie Spring and 1.5 km south of the track along the foot of the scarp.

YA 7191.<sup>80</sup>436; 17.6839°S, 125.0652°E

Ld33: Run 11, photo 5073, coordinates A/1.21/3.39/-.

Near the northwestern end of the Oscar Range southeast of Ninety Two Mile Creek, about 3.2 km north of the junction of the tracks to Mount Percy and "Ellendale".

YA 7125.<sup>80</sup>407; 17.7107°S, 125.0032°E

O/66: Run 11, photo 5072, coordinates B/0.98/2.50/-.

Towards the northern margin of the Oscar Plateau about 2.4 km west of Elimberrie Spring and about 2 km north-northeast of the head of Ninety Two Mile Creek.

YA 7145.<sup>80</sup>457; 17.6651°S, 125.0216°E

O/67: Run 11, photo 5072, coordinates B/1.06/2.59/-.

Towards the northern margin of the Oscar Plateau about 2.5 km west of Elimberrie Spring and about 2 km north-northeast of the head of Ninety Two Mile Creek; about 180 m northwest of O/66.

YA 7144.<sup>80</sup>458; 17.6640°S, 125.0207°E

O/77: Photo reference published as Run 11, photo 5072, coordinates B/0.26/0.29/-, which is close to O/76. The problem is discussed under O/76, above.

On the WAPET map O/77 is close to Ld30, about 1.1 km south-southeast of Elimberrie Spring, 500 m southwest of the top of the scarp.

YA 7174.<sup>80</sup>449; 17.6725°S, 125.0489°E

KP84: 17° 32.5', 125° 05.0'. Beside a stream on the west side of the ridge, 4 km north-northeast of "Fairfield" homestead, about 500 m north of the pinnacle labelled Cycad Hill on Playford & Lowry's map (Plate 1), but unnamed on the Leopold Downs sheet (which labels as Cycad Hill the top of the ridge 2.3 km further northeast).

YA 7212.<sup>80</sup>593; 17.5417°S, 125.0833°E

KP101: 17° 34.2', 125° 06.1'. At the foot of the ridge about 700 m south-southeast of the track through McSherry Gap, about 150 m east of the track south, and 3.8 km east of "Fairfield" homestead.

YA 7230.<sup>80</sup>623; 17.5700°S, 125.1017°E

KP111: "2 miles west of Wire Spring, 4 miles from Elimberrie" - 17° 40.5', 125° 05.2'. The two ways of locating this point do not agree. That by distance is probably wrong, since Wire (Wine) and Elimberrie Springs are 11 km (over 6.8 miles) apart in a direct line. The coordinates place the locality about 200 m south of the track between the two springs, about 6 km east of Elimberrie Spring.

YA 7214.<sup>80</sup>445; 17.6750°S, 125.0867°E

KP134: 17° 39.7', 125° 01.5'. Near the edge of the Oscar Plateau about 2.1 km west of Elimberrie Spring.

YA 7148.<sup>80</sup>625; 17.6617°S, 125.0250°E

## DETAILED LIST OF SPECIES OCCURRENCES

In this list the taxa are arranged alphabetically, with cross-indexing from junior synonyms to the currently accepted names. Against the number of the type locality for each species is an asterisk. For each locality or section interval I list the stratigraphic unit and zone as given in Veevers, 1959. There follows the name of the 1:100,000 sheet, then the most recently available stratigraphic position, and for some a brief comment.

For the purpose of the present paper, the maps in Playford & Lowry, 1966, and Druce & Radke, 1979, are the only sufficiently comprehensive published geological maps for the Lennard Shelf. The stratigraphic unit in which the locality falls on these maps is listed, the most recently applied unit name being in bold face. I refer to the un-named unit of mostly birds-eye limestone below the Gumhole Formation (see remarks by Roberts *et al.*, 1972, Nicoll & Druce, 1979, and Nicoll, 1980), which has generally been identified as the Pillara Limestone, as "Pillara Ls", following the usage in Roberts *et al.* (1972). Published maps which would allow reliable assignment of all the localities in that interval to the Nullara Limestone are not available.

A reassessment of the zonal scheme, other than the reordering in Roberts *et al.*, requires a much more comprehensive study than time allows, as it would involve integration of as much information as possible from conodonts and ostracods with the brachiopods, and would involve extensive recollecting and mapping. However, there are a few localities where it is possible from current information to make useful comment.

### *Athyris oscarensis* Veevers, 1959

- K235, 236, 237, 244 [DD2,B2, C1, C2, C9] - Sadler Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**
- K246 [DD2,C11] - Sadler Fm, zone uncertain -- BRUTEN: **Sadler Ls**, *saltica* or *torrida* Zone
- K283\* - Fairfield Beds, *proteus* Zone -- CUNNINGHAM: Fairfield Fm - **Gumhole Fm**
- K285 - Geikie Fm, *proteus* Zone -- FITZROY CROSSING: **Napier Fm**
- K287 - Fairfield Beds, *proteus* Zone -- ELMA: Fairfield Fm - **Gumhole Fm?** or "**Pillara Ls**"
- K288 - Fairfield Beds, *proteus* Zone -- ELMA: Fairfield Fm - **Gumhole Fm?** or "**Pillara Ls**"
- K289 [DF2,A1] - base of Fairfield Beds, *proteus* Zone -- ELMA: "**Pillara Ls**"
- K291, 292 [DF2,A3 & A4] - Fairfield Beds, *proteus* Zone -- ELMA: Fairfield Fm - **Gumhole Fm**
- Ld10 - Napier Fm, *proteus* Zone -- LEOPOLD DOWNS: **Windjana Ls**
- Ld25 - Fairfield Beds, *proteus* Zone -- ELLENDALE: Fairfield Fm - **Gumhole Fm**

*Atrypa aspera prideri* -- see *Desquamatia* (*Synatrypa*) *kimberleyensis* and *Spinatrypina* (*Spinatrypina*) *prideri*

*Atrypa desquamata kimberleyensis* -- see *Desquamatia* (*Synatrypa*) *kimberleyensis* and *Spinatrypina* (*Spinatrypina*) *prideri*

*Atrypa multimoda* -- see *Desquamatia* (*Synatrypa*) *kimberleyensis*

*Atrypa parva* -- see *Atrypa* (*Kyrtatrypa*) *teichert* and *Spinatrypina* (*Spinatrypina*) *prideri*

*Atrypa reticularis teichert* -- see *Atrypa* (*Kyrtatrypa*) *teichert*

### *Atrypa* (*Kyrtatrypa*) *teichert* (Coleman, 1951)

- ?K126 [DP3,D1] - Gogo Fm, *saltica* or *torrida* Zone. This locality is close to K125, which plots on the Playford & Lowry map as being within alluvium, although the appearance of the photo suggests outcrop. The locality is on a gully, and so the position is precise on both that map and the 1:100,000 sheet. The nearest Gogo Formation is about 650 m to the north-northwest, at the southeastern edge of the stratigraphically complex Teichert Hills; other units in the vicinity are the Sadler and Windjana Limestones, and the Virgin Hills Formation. The horizon cannot be checked properly from the information I have. BOHEMIA: **Gogo Fm?**
- K221, 223 to 225, 230 [DD1,D1, D3-D5, E3] - Sadler Fm, *torrida* Zone -- Bruton: **Sadler Ls**
- K266 [DD3,C2] - Sadler Fm, zone uncertain -- FITZROY CROSSING: **Sadler Ls**, *saltica* Zone or below
- T53\* (not 58) - Sadler Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**

*Avonia proteus* -- see *Nigerinoplica proteus*

*Camarotoechia lucida* -- see *Ptychomaletoechia lucida*

*Camaroechochia* sp. ind. -- see *Parvulaltarostrum veeversi*

cf. *Chonetipustula* sp. Veevers, 1959

K221 [DD1,D1] - Sadler Fm, *torrida* Zone -- BRUTEN: Sadler Ls

cf. *Productella* sp. Veevers, 1959

K222 [DD1,D2] - Sadler Fm, *torrida* Zone -- BRUTEN: Sadler Ls

*Crurithyris apena* Veevers, 1959

K103 - Sadler Fm, *apena* Zone -- BOHEMIA: Sadler Ls

K147 - Sadler Fm, *apena* Zone -- BOHEMIA: Sadler Ls (Veevers' description suggests it could be Windjana Limestone)

K148 - Sadler Fm, *apena* Zone -- BOHEMIA: Sadler Ls

K150\* - Sadler Fm, *apena* Zone -- BOHEMIA: Sadler Ls

K153 - Sadler Fm, *apena* Zone -- BOHEMIA: Sadler Ls

K154 - Sadler Fm, *apena* Zone -- BOHEMIA: Sadler Ls

G23 - Sadler Fm, *apena* Zone -- BRUTEN: probably Windjana Ls, but could be Pillara Ls

?Ld21 - Pillara Fm, *apena* Zone? -- LEOPOLD DOWNS: Pillara Ls

Ld31 - Napier Fm, *apena* Zone -- LEOPOLD DOWNS: Napier Fm

*Desquamatia* (*Synatrypa*) *kimberleyensis* (Coleman, 1951)

K103 - Sadler Fm, *apena* Zone -- BOHEMIA: Sadler Ls

K112 - Sadler Fm, *saltica* or *torrida* Zone -- BOHEMIA: Sadler Ls

K121 - Mt Pierre Gp, *saltica* or *torrida* Zone -- BOHEMIA: the locality is near K125, which is in a gully within alluvium. The nearest outcrops are Sadler Ls and Virgin Hills Fm.

K142 - Sadler Fm, zone uncertain -- BOHEMIA: Bugle Gap Ls? (the location is unreliable)

K144 - Sadler Fm, *saltica* Zone -- BOHEMIA: Bugle Gap Ls? (the location is unreliable)

K148 - Sadler Fm, *apena* Zone -- BOHEMIA: Sadler Ls

K150 - Sadler Fm, *apena* Zone -- BOHEMIA: Sadler Ls

K172 - Mt Pierre Gp, *saltica* or *torrida* Zone -- BOHEMIA: locality plots within alluvium - nearest outcrops are Sadler Ls and Virgin Hills Fm

K173 - Mt Pierre Gp, *saltica* or *torrida* Zone -- BOHEMIA: as for K172; placed by Hill & Jell (1970, p. 88) in the Gogo Fm

K174 - Mt Pierre Gp, *saltica* or *torrida* Zone -- BOHEMIA: as for K172

K215 [DD1,A2] - Sadler Fm, *saltica* Zone -- BRUTEN: Sadler Ls

K229 - Sadler Fm, *torrida* Zone -- BRUTEN: Sadler Ls

K235 to 237, 239, 241 to 244, 245? [DD2,B2, C1-2, C4, C6-9, C10] - Sadler Fm, *saltica* Zone  
BRUTEN: Sadler Ls

K246 - Sadler Fm, zone uncertain. BRUTEN: Sadler Ls, *saltica* or *torrida* Zone

K248 - Sadler Fm, zone uncertain. BRUTEN: Sadler Ls, *saltica* or *torrida* Zone

K250 - Sadler Fm, zone uncertain. BRUTEN: Sadler Ls, *saltica* or *torrida* Zone

K252 - Sadler Fm, zone uncertain. BRUTEN: Sadler Ls, *saltica* or *torrida* Zone

K253 - Sadler Fm, zone uncertain. BRUTEN: Sadler Ls, *saltica* or *torrida* Zone

K264, 265, 267, 269 [DD3,B1, C1, C3, C5] - Sadler Fm, zone uncertain -- FITZROY CROSSING:  
Sadler Ls, *saltica* Zone or below

K270 to 274, 276 [DD3,C6-C8, D2, D3, E4] - Sadler Fm, *saltica* Zone -- FITZROY CROSSING:  
Sadler Ls

K289 [DF2,A1] - base of Fairfield Beds, *proteus* Zone -- ELMA: "Pillara Ls" This is a mixed collection; Roberts et al., 1972, noted that the specimens of this atrypid do not belong with the other specimens in the collection.

K300 - Sadler Fm, zone uncertain -- FITZROY CROSSING: Pillara Ls

K301 - Sadler Fm, zone uncertain -- FITZROY CROSSING: Pillara Ls

K463 [DMP1,A11] - Pillara Ls, *ramosa* Zone -- FITZROY CROSSING: Pillara Ls

K480 - Sadler Fm, *saltica* or *torrida* Zone -- ELMA: horizon uncertain, locality plots at the end of a wedge of Sadler Limestone between Windjana Ls and Virgin Hills Fm

- K571 to 573 [DMP5,C2-3] - Pillara Ls, *saltica* Zone? -- LENNARD: Pillara Ls  
 G23 - Sadler Fm, *apena* Zone -- BOHEMIA: probably Windjana Ls. may be Pillara Ls  
 Ld8 - Oscar Fm, *saltica* or *torrida* Zone -- ELLENDALE: Pillara Ls?  
 Ld29 - Napier Fm, *scopimus* Zone? -- LEOPOLD DOWNS: Napier Fm  
 ? Ld31 - Napier Fm, *apena* Zone -- LEOPOLD DOWNS: Napier Fm  
 ?O/73 - Oscar Fm, *apena* Zone -- ELLENDALE: Napier Fm. Veevers was uncertain on the zonation, but following Nicoll (1980) the age is Famennian, so it cannot be the *saltica* zone  
 T53\* - Sadler Fm, *saltica* Zone -- BRUTEN: Sadler Ls

*Devonoproductus australis* Veevers, 1959

- ?K112 - Sadler Fm, *saltica* or *torrida* Zone -- BOHEMIA: Sadler Ls  
 ?K144 - Sadler Fm, *saltica* Zone -- BOHEMIA: Bugle Gap Ls? (location is not reliable)  
 K216 [DD1,A3] - Sadler Fm, *saltica* Zone -- BRUTEN: Sadler Ls  
 ?K230 [DD1,E3] - Sadler Fm, *torrida* Zone -- BRUTEN: Sadler Ls  
 K239 [DD2,C4] - Sadler Fm, *torrida* Zone -- BRUTEN: Sadler Ls  
 K244, K245\* [DD2, C9, C10] - Sadler Fm, *saltica* Zone -- BRUTEN: Sadler Ls  
 K246, 252 [DD2, C11, D8] - Sadler Fm, zone uncertain -- BRUTEN: Sadler Ls, *saltica* or *torrida* Zone  
 K276 [DD3,E4] - Sadler Fm, *saltica* Zone -- FITZROY CROSSING: Sadler Ls

*Douvillina (Douvillina) exquisita* -- see *Hercostrophia exquisita*

*Emanuella torrida* Veevers, 1959

- K221\*, 223, 226, 227, 230 [DD1,D1, D3, D6-7, E3] - Sadler Fm, *torrida* Zone -- BRUTEN: Sadler Ls  
 T54 - Sadler Fm, *torrida* Zone -- BRUTEN: probably Sadler Ls but could be Windjana Ls

*Fitzroyella primula* Veevers, 1959:

- K230\* [DD1,E3] - Sadler Fm, *torrida* Zone -- BRUTEN: Sadler Ls  
 K243 [DD2,C8] - Sadler Fm, *saltica* Zone -- BRUTEN: Sadler Ls  
 K246 - Sadler Fm, zone uncertain -- BRUTEN: Sadler Ls, *saltica* or *torrida* Zone  
 K270, 274, 276 [DD3,C6, D3, E4] - Sadler Fm, *saltica* Zone -- FITZROY CROSSING: Sadler Ls  
 T53 - Sadler Fm, *saltica* Zone -- BRUTEN: Sadler Ls

*Flabellulirostrum wolmericum* (Veevers, 1959)

- K98 - Mt Pierre Gp, *saltica* or *torrida* Zone -- BOHEMIA: Gogo Fm  
 K121 - Mt Pierre Gp, *saltica* or *torrida* Zone -- BOHEMIA: locality plots within alluvium - nearest outcrops are Sadler Ls and Virgin Hills Fm  
 K126 [DP3,D1] - Gogo Fm, *saltica* or *torrida* Zone -- BOHEMIA: as for K121  
 ?K144 - Sadler Fm, *saltica* Zone -- BOHEMIA: Bugle Gap Ls? (location is unreliable)  
 K172 - Mt Pierre Gp, *saltica* or *torrida* Zone -- BOHEMIA: locality plots within alluvium - nearest outcrops are Sadler Ls and Virgin Hills Fm  
 K173 - Mt Pierre Gp, *saltica* or *torrida* Zone -- BOHEMIA: as for K172; placed by Hill & Jell (1970, p. 88) in the Gogo Fm  
 K174 - Mt Pierre Gp, *saltica* or *torrida* Zone -- BOHEMIA: as for K172  
 K221\*, 224, 225, 228, 230 [DD1,D1, D4, D5, E1, E3] - Sadler Fm, *torrida* Zone -- BRUTEN: Sadler Ls  
 K270 [DD3,C6] - Sadler Fm, *saltica* Zone -- FITZROY CROSSING: Sadler Ls  
 ?K274 [DD3,D3] - Sadler Fm, *saltica* Zone -- FITZROY CROSSING: Sadler Ls  
 ?K480 - Sadler Fm, *saltica* or *torrida* Zone -- ELMA: horizon uncertain, locality plots at the end of a wedge of Sadler Limestone between Windjana Ls and Virgin Hills Fm  
 Ld8 - Oscar Fm, *saltica* or *torrida* Zone -- ELLENDALE: Pillara Ls?  
 T9 - Fossil Downs Fm, *saltica* or *torrida* Zone -- ELMA: Napier Fm? (position is inaccurate; possibly Pillara Limestone)  
 T54 - Sadler Fm, *torrida* Zone -- BRUTEN: probably Sadler Ls but could be Windjana Ls

*Gypidula fragilis* Veevers, 1959

- K216 [DD1,A3] - Sadler Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**  
 K236 [DD2,C1] - Sadler Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**  
 K237\*, 238, 239 [DD2,C2-4] - Sadler Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**  
 K273, 276 [DD3,D2, E4] - Sadler Fm, *saltica* Zone -- FITZROY CROSSING: **Sadler Ls**  
 T53 - Sadler Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**

*Hercostrophia exquisita* (Veevers, 1959)

- K236, 242, 244\*, 245 [DD2,C1, C7, C9-10] - Sadler Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**  
 K252 [DD2,D8] - Sadler Fm, zone uncertain -- BRUTEN: **Sadler Ls**, *saltica* or *torrida* Zone  
 K265, 266 [DD3,C2-3] - Sadler Fm, zone uncertain -- FITZROY CROSSING: **Sadler Ls**, *saltica* Zone or below  
 K276 [DD3,E4] - Sadler Fm, *saltica* Zone -- FITZROY CROSSING: **Sadler Ls**  
 ?K480 - Sadler Fm, *saltica* or *torrida* Zone -- ELMA: horizon uncertain, locality plots at the end of a wedge of Sadler Limestone between Windjana Ls and Virgin Hills Fm  
 T53 - Sadler Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**  
 T58 - Sadler Fm, *torrida* Zone -- BRUTEN: **Sadler Ls**

*Hypothyridina margarita* Veevers, 1959

- K103 - Sadler Fm, *apena* Zone -- BOHEMIA: **Sadler Ls**  
 K144 - Sadler Fm, *saltica* Zone -- BOHEMIA: **Sadler Ls?** (location unreliable)  
 K147 - Sadler Fm, *apena* Zone -- BOHEMIA: **Sadler Ls** (from Veevers' description could be Windjana Limestone)  
 K148 - Sadler Fm, *apena* Zone -- BOHEMIA: **Sadler Ls**  
 K150 - Sadler Fm, *apena* Zone -- BOHEMIA: **Sadler Ls**  
 K153 - Sadler Fm, *apena* Zone -- BOHEMIA: **Sadler Ls**  
 K154 - Sadler Fm, *apena* Zone -- BOHEMIA: **Sadler Ls**  
 K271, 274 [DD3,C7, D3] - Sadler Fm, *saltica* Zone -- FITZROY CROSSING: **Sadler Ls**  
 F33 - Napier Fm, *apena* Zone -- LENNARD: **Napier Fm**  
 G23 - Sadler Fm, *apena* Zone -- BOHEMIA: **probably Windjana Ls but could be Pillara Ls**  
 Ld31\* - Oscar Fm, *apena* Zone -- LEOPOLD DOWNS: **Napier Fm**  
 Ld33 - Oscar Fm, *apena* Zone -- LEOPOLD DOWNS: **Napier Fm** Veevers was uncertain on the zonation, but following Nicoll (1980) the age is Famennian, so it cannot be the *saltica* zone  
 ?O/73 - Oscar Fm, *apena* Zone -- ELLENDALE: **Napier Fm**. Veevers was uncertain on the zonation, but following Nicoll (1980) the age is Famennian, so it cannot be the *saltica* zone  
 ?O/67 - Transition between Pillara Ls and Napier Fm, *saltica* Zone? -- LEOPOLD DOWNS: **Windjana Ls**

*Hypseloterorhynchus pennatus* Sartenaer, 1971

- "Mt. Pierre" - FITZROY CROSSING  
 "au-dessus Casey Falls"\* - BOHEMIA

Both localities are stated to be in the Virgin Hills Formation - *Cheiloceras* and *Platyclymenia* goniatite zones. The locality information available is not sufficient for this to be confirmed.

*Hypsomyonia niphana* Veevers, 1959

- K215\* [DD1,A3] - Sadler Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**  
 K245 [DD2,C10] - Sadler Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**  
 K273, 276 [DD3,D2, E4] - Sadler Fm, *saltica* Zone -- FITZROY CROSSING: **Sadler Ls**

*Isorthis?* sp. indet. Veevers, 1959

- K243, 244 [DD2,C8-9] - Sadler Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**  
 K246 [DD2,C11] - Sadler Fm, zone uncertain -- BRUTEN: **Sadler Ls**, *saltica* or *torrida* Zone

*Kaysarella emanuelensis* Veevers, 1959

- K221, 222\*, 224, 225, 227 [DD1,D1-2, D4-5, D7] - Sadler Fm, *torrida* Zone -- BRUTEN: **Sadler Ls**  
 T54 - Sadler Fm, *torrida* Zone -- BRUTEN: **Sadler Ls**  
 T58 - Sadler Fm, *torrida* Zone -- BRUTEN: **Sadler Ls**



*Ladjia saltica* Veevers, 1959

- K213 [DMP2,E2] - Pillara Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**  
 K214, 215\*, 216 [DD1,A1-3] - Sadler Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**  
 K237, 239, 242, 245 [DD2,C2, C4, C7, C10] - Sadler Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**  
 K270, 272 to 274, 276 [DD3,C6, C8, D2-3, E4] - Sadler Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**  
 ?K573 [DMP5,C3] - Pillara Fm., *saltica* Zone? -- LENNARD: **Pillara Ls**  
 O/78 (*sic* - not listed on pp. 167 or 168, listed on p. 128 as being in the Oscar Range). - Pillara Fm  
 -- **presumed still Pillara Ls; zone unstated but presumed to be *saltica***

*Leptaena* sp. ind. Veevers, 1959

- K170 [DB1,K1] - Bugle Gap Ls, *proteus* Zone -- BOHEMIA: **Bugle Gap Ls**  
 KP101 - Napier Fm, *proteus* Zone -- LEOPOLD DOWNS: **Napier Fm**  
 KP149 - Oscar Fm, *proteus* Zone -- CUNNINGHAM: **Napier Fm**  
 T5 - Geikie Fm, *proteus* Zone -- FITZROY CROSSING: **Napier Fm**  
 T12 - Fairfield Beds, *proteus* Zone -- FITZROY CROSSING: **Piker Hills Fm**  
 T27 - Fairfield Beds, *proteus* Zone -- FITZROY CROSSING?: **Piker Hills or Virgin Hills Fm**

*Meristella(?) caprina* Veevers, 1959

- F34 - Napier Fm, *proteus* Zone -- LENNARD: **Windjana Ls**  
 KP149 - Oscar Fm, *proteus* Zone -- CUNNINGHAM: **Napier Fm**  
 KP181\* - Fairfield Beds, *proteus* Zone -- BOHEMIA: the locality is within an extensive area of alluvium, consequently the stratigraphic unit uncertain.  
 M2 - Fairfield Beds, *proteus* Zone -- LENNARD: Fairfield Fm - **Gumhole Fm?**  
 M9 - Fairfield Beds, *proteus* Zone -- LENNARD: Fairfield Fm - **Gumhole Fm?**

*Nervostrophia bunapica* Veevers, 1959

- ?K230 [DD1,E3] - Sadler Fm, *torrida* Zone -- BRUTEN: **Sadler Ls**  
 K245\* [DD2,C10] - Sadler Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**  
 K276 [DD3,E4] - Sadler Fm, *saltica* Zone -- FITZROY CROSSING: **Sadler Ls**  
 T53 - Sadler Fm, *saltica* Zone -- BRUTEN: **Sadler Ls**  
 O/67 - Transition between Pillara Fm and Napier Fm, *saltica* Zone? -- LEOPOLD DOWNS: **Windjana Ls**  
 O/73 - Oscar Fm, *apena* Zone -- ELLENDALE: **Napier Fm**; Veevers was uncertain on the zonation, but following Nicoll (1980) the age is Famennian, so it cannot be the *saltica* zone.

*Nigerinoplica proteus* (Veevers, 1959)

- K169, 170 [DB1,K1] - Bugle Gap Ls, *proteus* Zone -- BOHEMIA: **Bugle Gap Ls**  
 K180 [DP2,H-J] - Fairfield Beds, *proteus* Zone -- BOHEMIA: **Bugle Gap Ls**  
 K282 - Fairfield Beds, *proteus* Zone -- CUNNINGHAM: Fairfield Fm - **Gumhole Fm**  
 K283 - Fairfield Beds, *proteus* Zone -- CUNNINGHAM: Fairfield Fm - **Gumhole Fm**  
 K285 - Geikie Fm, *proteus* Zone -- FITZROY CROSSING: **Napier Fm**  
 K288 - Fairfield Beds, *proteus* Zone -- ELMA: Fairfield Fm - **Gumhole Fm or "Pillara Ls"**  
 K290\*, 292 [DF2,A2, A4] - Fairfield Beds, *proteus* Zone -- ELMA: Fairfield Fm - **Gumhole Fm**  
 K340 [DL1,E3] - Fairfield Beds, *proteus* Zone -- ELMA: Fairfield Fm - **"Pillara Ls"**  
 K341 [DL1,E4] - Fairfield Beds, *proteus* Zone -- ELMA: Fairfield Fm - **Gumhole Fm**  
 ?K355 - Fossil Downs Fm, *proteus* Zone? -- ELMA: **probably Virgin Hills Fm**  
 K506 [DS2,A3] - Geikie Fm, *proteus* Zone -- FITZROY CROSSING: **Napier Fm?**  
 K551 [DF8,A1] - Fairfield Beds, *proteus* Zone -- LEOPOLD DOWNS: **Napier Fm?**  
 KP103 - Napier Fm, *proteus* Zone -- LEOPOLD DOWNS: **Napier Fm**  
 KP107 - Napier Fm, *proteus* Zone -- LEOPOLD DOWNS: **Napier Fm**  
 KP109 - Napier Fm, *proteus* Zone -- LEOPOLD DOWNS: **Napier Fm**  
 ?KP111 - Napier Fm, *proteus* Zone? -- LEOPOLD DOWNS: **probably Napier Fm**  
 KP140 - Napier Fm, *proteus* Zone -- LEOPOLD DOWNS: **Napier Fm**  
 KP149 - Oscar Fm, *proteus* Zone -- CUNNINGHAM: **Napier Fm**  
 KP156 - Fairfield Beds, *proteus* Zone -- ELLENDALE: Fairfield Fm - **Gumhole Fm**  
 KP167 - Oscar Fm, *proteus* Zone -- ELLENDALE: **Napier Fm**

- KP168 - Fairfield Beds, *proteus* Zone -- LENNARD: the locality lies within an extensive area of alluvium; horizon uncertain
- ?Ld9 - Napier Fm, *proteus* Zone -- ELLENDALE: Napier Fm
- Ld11 - Napier Fm, *proteus* Zone -- LEOPOLD DOWNS: Napier Fm
- Ld26 - Fairfield Beds, *proteus* Zone -- ELLENDALE: Fairfield Fm - Gumhole Fm
- ?Ld28 - Napier Fm, *proteus* Zone? -- LEOPOLD DOWNS: Napier Fm
- M2 - Fairfield Beds, *proteus* Zone -- LENNARD: Fairfield Fm - Gumhole Fm?
- ?M3 - Fairfield Beds, *proteus* Zone -- LENNARD: Fairfield Fm - probably Gumhole Fm
- M8 - Fairfield Beds, *proteus* Zone -- LENNARD: Fairfield Fm - Gumhole Fm?
- M9 - Fairfield Beds, *proteus* Zone -- LENNARD: Fairfield Fm - Gumhole Fm?
- ?S4/91 - Oscar Fm, *proteus* Zone? -- LEOPOLD DOWNS: Napier Fm
- T5 - Geikie Fm, *proteus* Zone -- FITZROY CROSSING: Napier Fm
- T11 - Fairfield Beds, *proteus* Zone -- FITZROY CROSSING: Piker Hills Fm
- T12 - Fairfield Beds, *proteus* Zone -- FITZROY CROSSING: Piker Hills Fm
- T27 - Fairfield Beds, *proteus* Zone -- FITZROY CROSSING?: Piker Hills (possibly Virgin Hills Fm)

*Nyege scopimus* Veevers, 1959

- K145 - Bugle Gap Ls, *scopimus* Zone -- BOHEMIA: the locality is not reliable, but appears to be within alluvium, near outcrops of Bugle Gap Ls
- K159\*, 160 [DB1,B1] - Mt. Pierre Gp, *scopimus* Zone -- BOHEMIA: Bugle Gap Ls
- K166 to 168 [DB1,F1, G1] - Bugle Gap Ls, *scopimus* Zone -- BOHEMIA: Bugle Gap Ls
- K181 [DP2,E1] - top of Virgin Hills Fm, *scopimus* Zone -- BOHEMIA: Bugle Gap Ls
- KP72 - Napier Fm, *scopimus* Zone -- LENNARD: Napier Fm
- KP141 - Napier Fm, *scopimus* Zone -- LEOPOLD DOWNS: Napier Fm
- Ld16 - Napier Fm, *scopimus* Zone -- LEOPOLD DOWNS: Napier Fm
- Ld17 - Napier Fm, *scopimus* Zone -- LEOPOLD DOWNS: Napier Fm
- Ld20 - Napier Fm, *scopimus* Zone -- LEOPOLD DOWNS: Napier Fm
- Ld30 - Napier Fm, *scopimus* Zone -- LEOPOLD DOWNS: Napier Fm
- T18 - Virgin Hills Fm, *scopimus* Zone -- FITZROY CROSSING: Virgin Hills Fm
- T19 - Virgin Hills Fm, *scopimus* Zone -- FITZROY CROSSING: Virgin Hills &/or Piker Hills Fm
- T39 - Virgin Hills Fm, *scopimus* Zone -- FITZROY CROSSING: Virgin Hills Fm
- T40 - Virgin Hills Fm, *scopimus* Zone -- FITZROY CROSSING: probably Virgin Hills Fm
- T42 - Virgin Hills Fm, *scopimus* Zone -- BRUTEN: the locality lies within extensive alluvium, with outcrops of both Sadler Ls and Virgin Hills Fm nearby.
- T69 - Mt. Pierre Gp, *scopimus* Zone -- BOHEMIA: could be Windjana Ls or Virgin Hills Fm

*Parvulaltarostrum veeversi* Sartenaer, 1979

- F32 - Napier Fm, zone uncertain -- LENNARD: the published coordinates put the locality within the Van Emmerick Conglomerate!
- F33 - Napier Fm, *apena* Zone -- LENNARD: Napier Fm; Veevers was uncertain on the zonation, but following Nicoll (1980) the age is Famennian, so it cannot be the *saltica* zone.

*Phlogoiderhynchus arefactus* (Veevers, 1959)

- K230, [DD1,E3] - Sadler Fm, *torrida* Zone -- BRUTEN: Sadler Ls
- K231\* [DD1,E5] - Sadler Fm, zone uncertain -- BRUTEN: Sadler Ls, *torrida* Zone or above
- KP103 - Napier Fm, *proteus* Zone -- LEOPOLD DOWNS: Napier Fm
- T57 - Sadler or Gogo Fm, *torrida* Zone -- BRUTEN: Sadler Ls or Gogo Fm
- T58 - Sadler Fm, *torrida* Zone -- BRUTEN: Sadler Ls

*Plicochonetes macropatus* Veevers, 1959

- K221 to 224, 226, 227\*, 230 [DD1,D1-4, D6-7, E3] - Sadler Fm, *torrida* Zone -- BRUTEN: Sadler Ls

?*Productella occidua* Veevers, 1959

- K215 [DD1,A2] - Sadler Fm, *saltica* Zone -- BRUTEN: Sadler Ls
- K245 [DD2,C10] - Sadler Fm, *saltica* Zone -- BRUTEN: Sadler Ls
- K276 [DD3,E4] - Sadler Fm, *saltica* Zone -- FITZROY CROSSING: Sadler Ls

Productidae gen. et sp. ind. Veevers, 1959 -- see ?*Productella occidua*

*Ptychomaletoechia lucida* (Veevers, 1959)

- K169 [DB1,K1] - Bugle Gap Ls, *proteus* Zone -- BOHEMIA: Bugle Gap Ls
- K179 [DP2,H] - Fairfield Beds, *proteus* Zone -- BOHEMIA: Bugle Gap Ls
- K283 - Fairfield Beds, *proteus* Zone -- CUNNINGHAM: Fairfield Fm - Gumhole Fm
- K288 - Fairfield Beds, *proteus* Zone -- ELMA: Fairfield Fm - Gumhole Fm or "Pillara Ls"
- K289\* [DF2,A1] - Fairfield Beds, *proteus* Zone -- ELMA: "Pillara Ls"
- K292 [DF2,A4] - Fairfield Beds, *proteus* Zone -- ELMA: Fairfield Fm - Gumhole Fm
- K315 [DL2,E1] - Fairfield Beds, *proteus* Zone -- ELMA: "Pillara Ls"
- K318 [DL2,E3] - Fairfield Beds, *proteus* Zone -- ELMA: Fairfield Fm - Gumhole Fm?
- K319 [DF3,A1] - Fairfield Beds, *proteus* Zone -- ELMA: Piker Hills Fm
- K322 - Fairfield Beds, *proteus* Zone -- ELMA: Piker Hills Fm
- K327 - Fairfield Beds, *proteus* Zone -- ELMA: Virgin Hills Fm
- K551 - Fairfield Beds, *proteus* Zone -- LEOPOLD DOWNS: probably Napier Fm
- KP84 - Napier Fm, *proteus* Zone -- LEOPOLD DOWNS: Napier Fm
- KP103 - Napier Fm, *proteus* Zone -- LEOPOLD DOWNS: Napier Fm
- KP143 - Napier Fm, *proteus* Zone -- LEOPOLD DOWNS: Napier Fm
- KP164 - Fairfield Beds, *proteus* Zone -- ELLENDALE: the published coordinates put the locality in an extensive area of alluvium; the horizon is uncertain.
- Ld10 - Napier Fm, *proteus* Zone -- LEOPOLD DOWNS: Windjana Ls
- Ld25 - Fairfield Beds, *proteus* Zone -- ELLENDALE: Fairfield Fm - Gumhole Fm
- Ld32 - Napier Fm, *proteus* Zone -- LEOPOLD DOWNS: Napier Fm
- M3 - Fairfield Beds, *proteus* Zone -- LENNARD: Fairfield Fm - Gumhole Fm
- M8 - Fairfield Beds, *proteus* Zone -- LENNARD: Fairfield Fm - Gumhole Fm
- M9 - Fairfield Beds, *proteus* Zone -- LENNARD: Fairfield Fm - Gumhole Fm
- T1 - Fairfield Beds, *proteus* Zone -- HOOPER: could be Napier Fm or Windjana Ls
- T5 - Geikie Fm, *proteus* Zone -- FITZROY CROSSING: Napier Fm

*Pugnax hullensis* Veevers, 1959

- K356\* - Fossil Downs Fm, *scopimus* Zone? -- ELMA: Virgin Hills Fm
- KP106 - Napier Fm, *scopimus* Zone? -- LEOPOLD DOWNS: Napier Fm
- KP150 - Brooking Fm, *scopimus* Zone? -- HOOPER: Napier Fm
- Ld29 - Napier Fm, *scopimus* Zone? -- LEOPOLD DOWNS: Napier Fm
- O/77 - Napier Fm, *scopimus* Zone? -- LEOPOLD DOWNS: Windjana Ls
- Teichert 69 - Mt Pierre Gp, *scopimus* Zone -- BOHEMIA: probably Virgin Hills Fm but could be Windjana Ls

*Pugnax* sp. cf. *acuminatus* (J. Sowerby, 1882)

- F29 - Napier Fm, zone uncertain -- LENNARD: end of wedge of Pillara Ls between Windjana Ls and Virgin Hills Fm
- KP84 - Napier Fm, *proteus* Zone -- LEOPOLD DOWNS: Napier Fm
- KP152 - Napier Fm, zone uncertain -- LEOPOLD DOWNS: Napier Fm
- ?O/73 - Oscar Fm, *apena* Zone -- ELLENDALE: Napier Fm. Veevers was somewhat uncertain on the zonation, but following Nicoll (1980) the age is Famennian, so it cannot be the *saltica* zone
- O/76 - Pillara Ls, *saltica* Zone -- LEOPOLD DOWNS: Pillara Ls

*Pugnax* sp. cf. *pugnus* (Martin, 1809)

- K103 - Sadler Ls, *apena* Zone -- BOHEMIA: Sadler Ls
- K135 - Mt Pierre Gp, zone uncertain -- BOHEMIA: the locality plots within the Bobs Hole Conglomerate; the Virgin Hills Fm crops out nearby. On p. 28 Veevers describes the locality as a finger of Virgin Hills Fm within the Sparke Conglomerate.
- K144 - Sadler Ls, *saltica* Zone -- BOHEMIA: Bugle Gap Ls? (the location is unreliable)
- K148 - Sadler Ls, *apena* Zone -- BOHEMIA: Sadler Ls
- K169 [DB1,K1] - Bugle Gap Ls, *proteus* Zone -- BOHEMIA: Bugle Gap Ls
- K177 - Mt Pierre Gp, zone uncertain -- BOHEMIA: Virgin Hills Fm
- K244, 245 [DD2,C9-10] - Sadler Ls, *saltica* Zone -- BRUTEN: Sadler Ls

- K271 [DD3,C7] - Sadler Ls, *saltica* Zone -- FITZROY CROSSING: **Sadler Ls**  
 K506 [DS2,A3] - Geikie Fm, *proteus* Zone -- FITZROY CROSSING: **probably Napier Fm**  
 K539 [DO1,A1] - Oscar Fm, zone uncertain -- LEOPOLD DOWNS: **Napier Fm**  
 KP134 - Pillara Ls or Napier Fm, zone uncertain -- LEOPOLD DOWNS: **Napier Fm**  
 KP144 - Napier Fm, *proteus* Zone -- LEOPOLD DOWNS: **Napier Fm**  
 KP167 - Oscar Fm, *proteus* Zone -- ELLENDALE: **Napier Fm**  
 Ld19 - Napier Fm, zone uncertain -- LEOPOLD DOWNS: **Windjana Ls**  
 Ld31 - Napier Fm, *apena* Zone -- LEOPOLD DOWNS: **Napier Fm**  
 ?O/73 - Oscar Fm, *apena* Zone -- ELLENDALE: **Napier Fm**. Veevers was somewhat uncertain on the zonation, but following Nicoll (1980) the age is Famennian, so it cannot be the *saltica* zone  
 O/66 - Transition between Pillara Ls and Napier Fm, zone uncertain -- LEOPOLD DOWNS: **Windjana Ls**  
 T25 - Virgin Hills Fm, *proteus* Zone -- FITZROY CROSSING: **probably Piker Hills Fm but could include Virgin Hills Fm (a mixed collection from several levels on Mt Pierre)**

*Reticulariopsis suchana* (Veevers, 1959)

- K209\*, 210 [DMP2,C2-3] - Pillara Ls, *ramosa* Zone -- BRUTEN: **Pillara Ls**  
 ?K222 [DD1,D2] - Sadler Ls, *torrida* Zone -- BRUTEN: **Sadler Ls**  
 K463 [DMP1,A11] - Pillara Ls, *ramosa* Zone -- FITZROY CROSSING: **Pillara Ls**

*Rhipidomella incompta* Veevers, 1959

- K179 [DP2,H] - Fairfield Beds, *proteus* Zone -- BOHEMIA: **Bugle Gap Ls**  
 T4 - Geikie Fm, *proteus* Zone -- FITZROY CROSSING: **Napier Fm**  
 T25\* - Virgin Hills Fm, *proteus* Zone -- FITZROY CROSSING: **probably Piker Hills Fm but could include Virgin Hills Fm (a mixed collection from several levels on Mt Pierre)**  
 T26 - Virgin Hills Fm, *proteus* Zone -- FITZROY CROSSING: **Piker Hills Fm**

*Schizophoria apiculata* Veevers, 1959

- K322\* - Fairfield Beds, *proteus* Zone -- ELMA: **Piker Hills Fm**  
 ?K551 [DF8,A1] - Fairfield Beds, *proteus* Zone -- LEOPOLD DOWNS: **probably Napier Fm**

*Schizophoria pierrensis* Veevers, 1959

- ?K166 [DB1,F1] - Bugle Gap Ls, *scopinus* Zone -- BOHEMIA: **Bugle Gap Ls**  
 K169 [DB1,K1] - Bugle Gap Ls, *proteus* Zone -- BOHEMIA: **Bugle Gap Ls**  
 K285 - Geikie Fm, *proteus* Zone -- FITZROY CROSSING: **Napier Fm**  
 K503 - Fairfield Beds?, *proteus* Zone -- HOOPER: **"Pillara Ls"**  
 KP144 - Napier Fm, *proteus* Zone -- LEOPOLD DOWNS: **Napier Fm**  
 ?Ld9 - Napier Fm, *proteus* Zone -- ELLENDALE: **Napier Fm**  
 T25\* - Virgin Hills Fm, *proteus* Zone -- FITZROY CROSSING: **probably Piker Hills Fm but could include Virgin Hills Fm (a mixed collection from several levels on Mt Pierre)**  
 T26 - Virgin Hills Fm, *proteus* Zone -- FITZROY CROSSING: **Piker Hills Fm**

*Schizophoria* sp. ind. Veevers, 1959

- K230 [DD1,E3] - Sadler Ls, *torrida* Zone -- BRUTEN: **Sadler Ls**

*Schizophoria stainbrooki* Veevers, 1959

- F5 - Sadler Ls, zone uncertain -- LEOPOLD DOWNS? - "Leopold Downs" area; not marked on BMR copy of the WAPET locality map. **Presumed to be still Sadler Ls.**  
 ?K108 - Sadler Ls, zone uncertain -- BOHEMIA: **Virgin Hills Fm**  
 K214 to 216\* [DD1,A1-3] - Sadler Ls, *saltica* Zone -- BRUTEN: **Sadler Ls**  
 K217 to 220 [DD1,A4-5, B2, C1] - Sadler Ls, *saltica* or *torrida* Zone -- BRUTEN: **Sadler Ls**  
 K221 to 223 [DD1,D1-3] - Sadler Ls, *torrida* Zone -- BRUTEN: **Sadler Ls**  
 K235 to 245 [DD2,B2, C1-10] - Sadler Ls, *saltica* Zone -- BRUTEN: **Sadler Ls**  
 K246 to 252 [DD2,C11, D2-5, D7-8] - Sadler Ls, zone uncertain -- BRUTEN: **Sadler Ls, saltica or torrida Zone**  
 K268 [DD3,C4] - Sadler Ls, zone uncertain -- FITZROY CROSSING: **Sadler Ls, saltica Zone or below**

K273 to 276 [DD3, D2-3, E2, E4] - Sadler Ls, *saltica* Zone -- FITZROY CROSSING: Sadler Ls  
Teichert 53 - Sadler Ls, *saltica* Zone -- BRUTEN: Sadler Ls

*Schizophoria* sp. cf. *stainbrookii* Veevers

K285 - Geikie Fm, *proteus* Zone -- FITZROY CROSSING: Napier Fm  
K289 [DF2,A1] - Base of Fairfield Beds, *proteus* Zone -- ELMA: "Pillara Ls"  
Ld31 - Napier Fm, *apena* Zone -- LEOPOLD DOWNS: Napier Fm  
T5 - Geikie Fm, *proteus* Zone -- FITZROY CROSSING: Napier Fm

*Schuchertella dromeda* Veevers, 1959

K283\* - Fairfield Beds, *proteus* Zone -- CUNNINGHAM: Fairfield Fm - Gumhole Fm  
? K320 - Fairfield Beds, *proteus* Zone -- CUNNINGHAM: Fairfield Fm - Piker Hills Fm  
KP157 - Fairfield Beds, *proteus* Zone -- ELLENDALE: Fairfield Fm - Gumhole Fm

*Schuchertella gratillica* Veevers, 1959

K215 [DD1,A2] - Sadler Ls, *saltica* Zone -- BRUTEN: Sadler Ls  
K245 [DD2,C10] - Sadler Ls, *saltica* Zone -- BRUTEN: Sadler Ls  
K246\* [DD2,C11] - Sadler Ls, zone uncertain -- BRUTEN: Sadler Ls, *saltica* or *torrida* Zone  
K276 [DD3,E4] - Sadler Ls, *saltica* Zone -- FITZROY CROSSING: Sadler Ls

*Skenidium asellatum* Veevers, 1959

K245 [DD2,C10] - Sadler Ls, *saltica* Zone -- BRUTEN: Sadler Ls  
K276\* [DD3,E4] - Sadler Ls, *saltica* Zone -- FITZROY CROSSING: Sadler Ls

*Spinatrypa aspera prideri* -- see *Spinatrypina* (*Spinatrypina*) *prideri*

*Spinatrypina* (*Exatrypa*) *kuniandia* Grey, 1978

Grey records this species from two localities (NOB12\*, NOB14) in the Sadler Limestone, and possibly from two others (MRM7, 26) in the Pillara Limestone. The first two are on Sadler Ridge southwest of Longs Well, MRM7 is on the west side of Bugle Gap, MRM26 is northeast of the northern entrance to Bugle Gap.

*Spinatrypina* (*Spinatrypina*) *prideri* (Coleman, 1951)

Grey, 1978, in revising the atrypids, divided Coleman's species into several subspecies. The material used by Veevers was not studied, apparently, and so the occurrences at the localities cited by Veevers cannot be assigned to these subspecies without further careful study. The currently recognised subspecies known from the Canning Basin, and their stratigraphic distribution according to Grey, are:

*S. (S.) prideri prideri* (Coleman) from the Sadler Limestone.

*S. (S.) prideri nurungunia* Grey from the Sadler and Pillara Limestones.

The localities cited by Veevers for *S. (S.) prideri* SENSU LATO are:

K230 [DD1,E3] - Sadler Ls, *torrida* Zone -- BRUTEN: Sadler Ls  
?K503 - Fairfield Beds?, *proteus* Zone -- HOOPER: "Pillara Ls" -- see comment on age (only Frasnian) by Grey, 1978.  
T31\* - Sadler Ls, zone uncertain -- FITZROY CROSSING: probably Sadler Ls but could be Pillara Ls

From the localities cited by Veevers, Grey (1978, p. 33) adds, for *S. (S.) prideri prideri*:

T54 - Sadler Ls, *torrida* Zone -- BRUTEN: probably Sadler Ls, possibly Windjana Ls

*Steinhagella numida* -- see *Veeversallosia numida*

*Stringocephalus fontanus* Veevers, 1959

K438\* - Basal Pillara Ls, *fontanus* Zone -- FITZROY CROSSING: Pillara Ls

*Teichertina fitzroyensis* Veevers, 1959

K215\*, 216 [DD1,A2-3] - Sadler Ls, *saltica* Zone -- BRUTEN: Sadler Ls  
K245 [DD2,C10] - Sadler Ls, *saltica* Zone -- BRUTEN: Sadler Ls  
K276 [DD3,E4] - Sadler Ls, *saltica* Zone -- FITZROY CROSSING: Sadler Ls  
T53 - Sadler Ls, *saltica* Zone -- BRUTEN: Sadler Ls

Terebratulacea, gen. et sp. ind. I, Veevers, 1959

K215 [DD1,A2] - Sadler Ls, *saltica* Zone -- BRUTEN: Sadler Ls

T53 - Sadler Ls, *saltica* Zone -- BRUTEN: Sadler Ls

Terebratulacea, gen. et sp. ind. II, Veevers, 1959

T18 - Virgin Hills Fm, *scopimus* Zone -- FITZROY CROSSING: Virgin Hills Fm

*Tingella suchana* -- see *Reticulariopsis suchana*

*Uncinulus arefactus* -- see *Phlogoiderhynchus arefactus*

*Uncinulus wolmericus* -- see *Flabellulirostrum wolmericum*

*Veeversalosis numida* (Veevers, 1959)

K244, 245\* [DD2,C9-10] - Sadler Ls, *saltica* Zone -- BRUTEN: Sadler Ls

K246 [DD2, C11] - Sadler Ls, zone uncertain -- BRUTEN: Sadler Ls, *saltica* or *torrida* Zone

*Zophostrophia ungamica* Veevers, 1959

K245\* [DD2,C10] - Sadler Ls, *saltica* Zone -- BRUTEN: Sadler Ls

K276 [DD3,E4] - Sadler Ls, *saltica* Zone -- FITZROY CROSSING: Sadler Ls

## FAUNAL SUMMARY: SPECIES IN EACH FORMATION

This section is a summary of the Devonian brachiopod faunas of the individual formations in the Canning Basin. Because of the complex stratigraphic relationships, the formations are listed alphabetically. For each formation the taxa are grouped in successive zones, then alphabetically within each group.

### Bugle Gap Limestone -- fore-reef and inter-reef facies

*Nyege scopimus* -- *scopimus* Zone  
*Schizophoria pierrensis* -- *scopimus?* and *proteus* Zones  
*Leptaena* sp. ind. -- *proteus* Zone  
*Nigerinoplica proteus* -- *proteus* Zone  
*Ptychomaletoechia lucida* -- *proteus* Zone  
*Pugnax* sp. cf. *pugnus* -- *proteus* Zone  
*Rhipidomella incompta* -- *proteus* Zone

### Gogo Formation -- fore-reef and inter-reef facies

? *Atrypa* (*Kyrtatrypa*) *teichertii* -- *saltica* or *torrida* Zone  
*Flabellulirostrum wolmericum* -- *saltica* or *torrida* Zone

### Gumhole Formation -- backreef facies

*Athyris oscarensis* -- *proteus* Zone  
? *Meristella*(?) *caprina* -- *proteus* Zone  
*Nigerinoplica proteus* -- *proteus* Zone  
*Ptychomaletoechia lucida* -- *proteus* Zone  
*Schuchertella dromeda* -- *proteus* Zone

### Napier Fm -- (fore-reef/inter-reef facies)

*Crurithyris apena* -- *apena* Zone  
*Hypothyridina margarita* -- *apena* Zone  
*Nervostrophia bunapica* -- *apena* Zone  
*Parvulaltarostrum veeversi* -- *apena* Zone  
*Desquamatia* (*Synatrypa*) *kimberleyensis* -- *apena*, *scopimus?* Zones  
*Pugnax* sp. cf. *pugnus* -- *apena*, *proteus* Zones  
*Pugnax* sp. cf. *acuminatus* -- *apena*, *proteus* Zones  
*Schizophoria* sp. cf. *stainbrooki* -- *apena*, *proteus* Zones  
*Pugnax hullensis* -- *scopimus?* Zone  
*Athyris oscarensis* -- *proteus* Zone  
*Leptaena* sp. ind. -- *proteus* Zone  
*Meristella*(?) *caprina* -- *proteus* Zone  
*Nigerinoplica proteus* -- *proteus* Zone  
*Phlogoiderhynchus arefactus* -- *proteus* Zone  
*Ptychomaletoechia lucida* -- *proteus* Zone  
*Rhipidomella incompta* -- *proteus* Zone  
? *Schizophoria apiculata* -- *proteus* Zone  
*Schizophoria pierrensis* -- *proteus* Zone

**Piker Hills Formation -- fore-reef and inter-reef facies**

*Leptaena* sp. ind. -- *proteus* Zone  
*Nigerinoplica proteus* -- *proteus* Zone  
*Ptychomaletoechia lucida* -- *proteus* Zone  
 ? *Pugnax* sp. cf. *pugnus* -- *proteus* Zone  
*Rhipidomella incompta* -- *proteus* Zone  
*Schizophoria apiculata* -- *proteus* Zone  
*Schizophoria pierrensis* -- *proteus* Zone  
 ? *Schuchertella dromeda* -- *proteus* Zone

**Pillara Limestone sensu stricto -- back-reef facies**

*Stringocephalus fontanus* -- *fontanus* Zone  
*Reticulariopsis suchana* -- *ramosa* Zone  
*Desquamatia* (*Synatrypa*) *kimberleyensis* -- *ramosa*, *saltica*, possibly to *torrida* Zones; also (but more likely Windjana Limestone) possible *apena* Zone  
*Pugnax* sp. cf. *acuminatus* -- *saltica* Zone  
*Ladjia saltica* -- *saltica* Zone  
*Flabellulirostrum wolmericum* -- *saltica* or *torrida* Zone  
 ? *Crurithyris apena* -- *apena* Zone?  
 ? *Hypothyridina margarita* -- *apena* Zone [probably Windjana Ls]  
*Spinatrypina* (*Exatrypa*) *kuniandia* -- Zone uncertain

**"Pillara" Limestone (Nullara Limestone, ± ) -- backreef facies**

*Athyris oscarensis* -- *proteus* Zone  
*Nigerinoplica proteus* -- *proteus* Zone  
*Ptychomaletoechia lucida* -- *proteus* Zone  
*Schizophoria pierrensis* -- *proteus* Zone  
*Schizophoria* sp. cf. *stainbrooki* -- *proteus* Zone  
*Spinatrypina* (*Spinatrypina*) *prideri* SENSU LATO -- *proteus* Zone? (Grey, 1978 - Frasnian only)

**Sadler Limestone -- fore-reef and inter-reef facies**

*Desquamatia* (*Synatrypa*) *kimberleyensis* -- a little below known *saltica* Zone to *apena* Zone  
*Hercostrophia exquisita* -- a little below known *saltica* Zone to *torrida* Zone  
*Gypidula fragilis* -- *saltica* Zone  
*Hypsomyonia niphana* -- *saltica* Zone  
*Ladjia saltica* -- *saltica* Zone  
 ? *Productella occidua* -- *saltica* Zone  
*Schuchertella gratillica* -- *saltica* Zone  
*Skenidium asellatum* -- *saltica* Zone  
*Teichertina fitzroyensis* -- *saltica* Zone  
*Terebratulacea*, gen. et sp. ind. I -- *saltica* Zone  
*Veeversalosis numida* -- *saltica* Zone  
*Zophostrophia ungamica* -- *saltica* Zone  
*Athyris oscarensis* -- *saltica* Zone and a little above  
*Isorthis?* sp. indet. -- *saltica* Zone and a little above  
*Nervostrophia bunapica* -- *saltica* and possibly *torrida* Zones  
*Atrypa* (*Kyrtatrypa*) *teichertii* -- *saltica* and *torrida* Zones  
*Devonoproductus australis* -- *saltica* and *torrida* Zones  
*Fitzroyella primula* -- *saltica* and *torrida* Zones  
*Flabellulirostrum wolmericum* -- *saltica* and *torrida* Zones  
*Schizophoria stainbrooki* -- *saltica* and *torrida* Zones



*Hypothyridina margarita* -- *saltica* and *apena* Zones  
*Pugnax* sp cf. *pugnus* -- *saltica* and *apena* Zones  
 cf. *Chonetipustula* sp. -- *torrida* Zone  
 cf. *Productella* sp. -- *torrida* Zone  
*Emanuella torrida* -- *torrida* Zone  
*Kaysarella emanuelensis* -- *torrida* Zone  
*Plicochonetes macropatus* -- *torrida* Zone  
*Reticulariopsis suchana* -- *torrida* Zone?  
*Schizophoria* sp. ind. -- *torrida* Zone  
*Spinatrypina* (*Spinatrypina*) *prideri* SENSU LATO -- *torrida* Zone  
*Phlogoiderhynchus arefactus* -- *torrida* Zone and just above  
*Crurithyris apena* -- *apena* Zone

*Spinatrypina* (*Exatrypa*) *kuniandia* -- Zone unknown

#### Virgin Hills Formation -- fore-reef and inter-reef facies

*Nyege scopimus* -- *scopimus* Zone  
*Pugnax hullensis* -- *scopimus* Zone  
*Terebratulacea*, gen. et sp. ind. II -- *scopimus* Zone  
 ? *Nigerinoplica proteus* -- *proteus* Zone  
*Ptychomaletoechia lucida* -- *proteus* Zone  
*Pugnax* sp cf. *pugnus* -- *proteus* Zone  
*Schizophoria pierrensis* -- Zone uncertain  
 ? *Schizophoria stainbrooki* -- Zone uncertain

*Hypseloterorhynchus pennatus* -- *Cheiloceras* and *Platyclymenia goniatile* Zones

#### Windjana Limestone -- reef facies

*Nervostrophia bunapica* -- *saltica* Zone?  
*Hypothyridina margarita* -- possibly *saltica* Zone; *apena* Zone (could be Pillara Ls)  
 ? *Emanuella torrida* -- *torrida* Zone (more likely Sadler Ls)  
 ? *Flabellulirostrum wolmericum* -- *torrida* Zone (more likely Sadler Ls)  
*Spinatrypina* (*Spinatrypina*) *prideri* SENSU LATO -- *torrida* Zone (more likely Sadler Ls)  
*Crurithyris apena* -- *apena* Zone (could be Pillara Ls)  
*Desquamatia* (*Synatrypa*) *kimberleyensis* -- *apena* Zone (could be Pillara Ls)  
*Nyege scopimus* -- *scopimus* Zone (could be Virgin Hills Fm)  
*Pugnax hullensis* -- *scopimus* Zone?  
*Athyris oscarensis* -- *proteus* Zone  
*Meristella(?) caprina* -- *proteus* Zone  
*Ptychomaletoechia lucida* -- *proteus* Zone  
*Pugnax* sp cf. *pugnus* -- Zone uncertain

## SUMMARIES OF STRATIGRAPHIC DISTRIBUTION OF SPECIES

This section summarizes the distribution of the brachiopod species. It is in two parts, in each of which the species are listed alphabetically under their current names. The first part lists alphabetically the formations in which each species occurs, and for each formation the zone or range of zones for that species. The second part reverses this -- the zones are listed first, in sequence, and for each zone the formations are listed.

### SUMMARY OF OCCURRENCES ORDERED BY FORMATION

*Athyris oscarensis* Veevers, 1959

Gumhole Fm *proteus* Zone

Gumhole Fm? or "Pillara Ls" *proteus* Zone

Napier Fm *proteus* Zone

"Pillara Ls" *proteus* Zone

Sadler Ls *saltica* Zone and possibly *torrida* Zone

Windjana Ls *proteus* Zone

*Atrypa* (*Kyrtatrypa*) *teichertii* (Coleman, 1951)

Gogo Fm? ? *saltica* or *torrida* Zone.

Sadler Ls *saltica* Zone or below, and *torrida* Zone

cf. *Chonetipustula* sp. Veevers, 1959

Sadler Ls *torrida* Zone

cf. *Productella* sp. Veevers, 1959

Sadler Ls *torrida* Zone

*Crurithyris apena* Veevers, 1959

Napier Fm *apena* Zone

? Pillara Ls *apena* Zone?

Sadler Ls *apena* Zone

Windjana Ls (could be Pillara Ls) *apena* Zone

*Desquamatia* (*Synatrypa*) *kimberleyensis* (Coleman, 1951)

? Bugle Gap Ls *saltica* Zone

Gogo Fm? *saltica* or *torrida* Zones

Napier Fm *apena* and *scopimus?* Zones

Pillara Ls *ramosa*, *saltica?* and possibly *torrida* Zones

Sadler Ls *saltica* Zone and below, *torrida* and *apena* Zones.

Windjana Ls.? (may be Pillara Ls) *apena* Zone

*Devonoproductus australis* Veevers, 1959

? Bugle Gap Ls *saltica* Zone

Sadler Ls *saltica* to *torrida* Zones

*Emanuella torrida* Veevers, 1959

Sadler Ls *torrida* Zone

Sadler Ls but could be Windjana Ls *torrida* Zone

*Fitzroyella primula* Veevers, 1959:

Sadler Ls *saltica* and *torrida* Zones

*Flabellulirostrum wolmericum* (Veevers, 1959)

? Bugle Gap Ls *saltica* Zone

Gogo Fm *saltica* or *torrida* Zone

Napier Fm (could be Pillara Ls) *saltica* or *torrida* Zone

Pillara Ls? *saltica* or *torrida* Zone

Sadler Ls *saltica* and *torrida* Zones

Sadler Ls (could be Windjana Ls) *torrida* Zone

*Gypidula fragilis* Veevers, 1959

Sadler Ls *saltica* Zone

*Hercostrophia exquisita* (Veevers, 1959)

Sadler Ls *saltica* Zone and below, *torrida* Zone

*Hypothyridina margarita* Veevers, 1959

Napier Fm *apena* Zone

Sadler Ls *saltica* and *apena* Zones

Windjana Ls (could be Pillara Ls) *apena* Zone

? Windjana Ls *saltica* Zone?

*Hypseloterorhynchus pennatus* Sartenaer, 1971

Virgin Hills Fm *Cheiloceras* and *Platyclymenia* goniatite zones

*Hypsomyonia niphana* Veevers, 1959

Sadler Ls *saltica* Zone

*Isorthis?* sp. indet. Veevers, 1959

Sadler Ls *saltica* and possibly *torrida* Zones

*Kaysarella emanuelensis* Veevers, 1959

Sadler Ls *torrida* Zone

*Ladjia saltica* Veevers, 1959

? Pillara Ls *saltica* Zone?

Sadler Ls *saltica* Zone

*Leptaena* sp. ind. Veevers, 1959

Bugle Gap Ls *proteus* Zone

Napier Fm *proteus* Zone

Piker Hills Fm *proteus* Zone

Piker Hills or Virgin Hills Fm *proteus* Zone

*Meristella(?) caprina* Veevers, 1959

Gumhole Fm? *proteus* Zone

Napier Fm *proteus* Zone

Windjana Ls *proteus* Zone

stratigraphic unit uncertain (type loc.) *proteus* Zone

*Nervostrophia bunapica* Veevers, 1959

Napier Fm *apena* Zone

Sadler Ls *saltica*

? Sadler Ls *torrida* Zone

Windjana Ls *saltica* Zone?

*Nigerinoplica proteus* (Veevers, 1959)

Bugle Gap Ls *proteus* Zone  
 Gumhole Fm *proteus* Zone  
 Gumhole Fm or "Pillara Ls" *proteus* Zone  
 Napier Fm *proteus* Zone  
 Piker Hills Fm *proteus* Zone  
 Piker Hills or Virgin Hills Fm *proteus* Zone  
 "Pillara Ls" *proteus* Zone  
 ? Virgin Hills Fm *proteus* Zone?

*Nyege scopimus* Veevers, 1959

Bugle Gap Ls *scopimus* Zone  
 Napier Fm *scopimus* Zone  
 Virgin Hills Fm *scopimus* Zone  
 Virgin Hills &/or Piker Hills Fm *scopimus* Zone  
 Windjana Ls or Virgin Hills Fm *scopimus* Zone

*Parvulaltarostrum veeversi* Sartenaer, 1979

Napier Fm *apena* Zone

*Phlogoiderhynchus arefactus* (Veevers, 1959)

Napier Fm *proteus* Zone  
 Sadler Ls *torrida* Zone and just above  
 Sadler Ls or Gogo Fm *torrida* Zone

*Plicochonetes macropatus* Veevers, 1959

Sadler Ls *torrida* Zone

? *Productella occidua* Veevers, 1959

Sadler Ls *saltica* Zone

*Ptychomaletoechia lucida* (Veevers, 1959)

Bugle Gap Ls *proteus* Zone  
 Gumhole Fm *proteus* Zone  
 Gumhole Fm or "Pillara Ls" *proteus* Zone  
 Napier Fm *proteus* Zone  
 Napier Fm or Windjana Ls *proteus* Zone  
 Piker Hills Fm *proteus* Zone  
 "Pillara Ls" *proteus* Zone  
 Virgin Hills Fm *proteus* Zone  
 Windjana Ls *proteus* Zone

*Pugnax hullensis* Veevers, 1959

Napier Fm *scopimus* Zone?  
 Virgin Hills Fm *scopimus* Zone?  
 Virgin Hills Fm (could be Windjana Ls) *scopimus* Zone  
 Windjana Ls *scopimus* Zone?

*Pugnax* sp. cf. *acuminatus* (J. Sowerby, 1882)

Napier Fm *apena* and *proteus* Zones  
 Pillara Ls *saltica* Zone

*Pugnax* sp cf. *pugnus* (Martin, 1809)

Bugle Gap Ls *saltica* and *proteus* Zones  
 Napier Fm *apena* and *proteus* Zones  
 Piker Hills Fm (could be Virgin Hills Fm) (a mixed collection from several levels on Mt Pierre)  
*proteus* Zone  
 Sadler Ls *saltica* Zone and *apena* Zones

**Virgin Hills Fm** zone uncertain  
**Windjana Ls** zone uncertain

*Reticulariopsis suchana* (Veevers, 1959)

**Pillara Ls** *ramosa* Zone  
**? Sadler Ls** *torrida* Zone

*Rhipidomella incompta* Veevers, 1959

**Bugle Gap Ls** *proteus* Zone  
**Napier Fm** *proteus* Zone  
**Piker Hills Fm** *proteus* Zone  
**Piker Hills Fm** (could be also **Virgin Hills Fm**) (encompasses several levels on Mt Pierre) *proteus* Zone

*Schizophoria apiculata* Veevers, 1959

**? Napier Fm?** *proteus* Zone  
**Piker Hills Fm** *proteus* Zone

*Schizophoria pierrensis* Veevers, 1959

**Bugle Gap Ls** *proteus* and possibly *scopimus* Zones  
**Napier Fm** *proteus* Zone  
**Piker Hills Fm** *proteus* Zone  
**Piker Hills Fm** (could be also **Virgin Hills Fm**) (encompasses several levels on Mt Pierre) *proteus* Zone  
**"Pillara Ls"** *proteus* Zone

*Schizophoria* sp. ind. Veevers, 1959

**Sadler Ls** *torrida* Zone

*Schizophoria stainbrooki* Veevers, 1959

**Sadler Ls** *saltica* and *torrida* Zones  
**? Virgin Hills Fm** zone uncertain

*Schizophoria* sp. cf. *stainbrooki* Veevers

**Napier Fm** *apena* and *proteus* Zones  
**"Pillara Ls"** *proteus* Zone

*Schuchertella dromeda* Veevers, 1959

**Gumhole Fm** *proteus* Zone  
**? Piker Hills Fm** *proteus* Zone

*Schuchertella gratillica* Veevers, 1959

**Sadler Ls** *saltica* and possibly *torrida* Zones

*Skenidium asellatum* Veevers, 1959

**Sadler Ls** *saltica* Zone

*Spinatrypina* (*Exatrypa*) *kuniandia* Grey, 1978

**Sadler Ls** zone unknown  
**Pillara Ls?** zone unknown

*Spinatrypina (Spinatrypina) prideri* (Coleman, 1951) SENSU LATO

? "Pillara Ls" *proteus* Zone -- but see comment on age (only Frasnian) by Grey, 1978.

Sadler Ls *torrida* Zone

Sadler Ls (could be Pillara Ls) zone uncertain

Sadler Ls (could be Windjana Ls) *torrida* Zone

*S. (S.) prideri prideri* (Coleman)

Sadler Limestone zone unknown (Grey, 1978)

*S. (S.) prideri nurungunia* Grey

Sadler and Pillara Limestones zone unknown (Grey, 1978)

*Stringocephalus fontanus* Veevers, 1959

Pillara Ls *fontanus* Zone

*Teichertina fitzroyensis* Veevers, 1959

Sadler Ls *saltica* Zone

Terebratulacea, gen. et sp. ind. I, Veevers, 1959

Sadler Ls *saltica* Zone

Terebratulacea, gen. et sp. ind. II, Veevers, 1959

Virgin Hills Fm *scopimus* Zone

*Veeversalosis numida* (Veevers, 1959)

Sadler Ls *saltica* and possibly *torrida* Zones

*Zophostrophia ungamica* Veevers, 1959

Sadler Ls *saltica* Zone

## SUMMARY OF OCCURRENCES ORDERED BY ZONE

*Athyris oscarensis* Veevers, 1959

*saltica* Zone -- Sadler Ls

*saltica* to *torrida* Zone -- Sadler Ls

*proteus* Zone -- Gumhole Fm, Napier Fm, "Pillara Ls", Windjana Ls

*Atrypa (Kyratrypa) teichert* (Coleman, 1951)

below definite *saltica* Zone -- Sadler Ls

*saltica* Zone -- Sadler Ls

? *saltica* or *torrida* Zone -- Gogo Fm?

*torrida* Zone -- Sadler Ls

cf. *Chonetipustula* sp. Veevers, 1959

*torrida* Zone -- Sadler Ls

cf. *Productella* sp. Veevers, 1959

*torrida* Zone -- Sadler Ls

*Crurithyris apena* Veevers, 1959

*apena* Zone -- Napier Fm, Sadler Ls, Windjana Ls (could be Pillara Ls)

? *apena* Zone? -- Pillara Ls

*Desquamatia (Synatrypa) kimberleyensis* (Coleman, 1951)

- ramosa* Zone -- Pillara Ls
- below definite *saltica* zone -- Sadler Ls
- saltica* Zone -- Bugle Gap Ls?, Sadler Ls
- saltica* Zone? -- Pillara Ls
- saltica* or *torrida* Zone -- Gogo Fm?, Pillara Ls?, Sadler Ls
- torrida* Zone -- Sadler Ls
- apena* Zone -- Napier Fm, Sadler Ls, Windjana Ls (may be Pillara Ls)
- scopimus* Zone? -- Napier Fm

*Devonoproductus australis* Veevers, 1959

- saltica* Zone -- Bugle Gap Ls?, Sadler Ls
- saltica* or *torrida* Zone -- Sadler Ls
- torrida* Zone -- Sadler Ls

*Emanuella torrida* Veevers, 1959

- torrida* Zone -- Sadler Ls, Sadler Ls (could be Windjana Ls)

*Fitzroyella primula* Veevers, 1959:

- saltica* Zone -- Sadler Ls
- just above *saltica* Zone -- Sadler Ls
- torrida* Zone -- Sadler Ls

*Flabellulirostrum wolmericum* (Veevers, 1959)

- saltica* Zone -- Bugle Gap Ls?, Sadler Ls
- saltica* or *torrida* Zone -- Gogo Fm, Pillara Ls?, Napier Fm (could be Pillara Ls)
- torrida* Zone -- Sadler Ls, Sadler Ls (could be Windjana Ls)

*Gypidula fragilis* Veevers, 1959

- saltica* Zone -- Sadler Ls

*Hercostrophia exquisita* (Veevers, 1959)

- below definite *saltica* Zone -- Sadler Ls
- saltica* Zone -- Sadler Ls
- torrida* Zone -- Sadler Ls

*Hypothyridina margarita* Veevers, 1959

- saltica* Zone -- Sadler Ls
- saltica* Zone? -- Windjana Ls
- apena* Zone -- Napier Fm, Sadler Ls, Windjana Ls (could be Pillara Ls)

*Hypseloterorhynchus pennatus* Sartenaer, 1971

2 locs, stated to be Virgin Hills Formation - *Cheiloceras* and *Platyclymenia* goniatite zones. The locality information available is not sufficient for this to be confirmed.

*Hypsomyonia niphana* Veevers, 1959

- saltica* Zone -- Sadler Ls

*Isorthis?* sp. indet. Veevers, 1959

- saltica* Zone -- Sadler Ls
- saltica* or *torrida* Zone -- Sadler Ls

*Kayserella emanuelensis* Veevers, 1959

- torrida* Zone -- Sadler Ls

*Ladjia saltica* Veevers, 1959

- saltica* Zone -- Pillara Ls?, Sadler Ls

*Leptaena* sp. ind. Veevers, 1959

*proteus* Zone -- Bugle Gap Ls, Napier Fm, Piker Hills Fm, Piker Hills or Virgin Hills Fm

*Meristella(?) caprina* Veevers, 1959

*proteus* Zone -- Gumhole Fm?, Napier Fm, Windjana Ls

*Nervostrophia bunapica* Veevers, 1959

*saltica* Zone -- Sadler Ls

*saltica* Zone? -- Windjana Ls

*apena* Zone -- Napier Fm

*torrida* Zone -- Sadler Ls?

*Nigerinoplica proteus* (Veevers, 1959)

*proteus* Zone -- Bugle Gap Ls, Gumhole Fm, Napier Fm, Piker Hills Fm, "Pillara Ls",  
Piker Hills or Virgin Hills Fm

? *proteus* Zone? -- Virgin Hills Fm

*Nyege scopimus* Veevers, 1959

*scopimus* Zone -- Bugle Gap Ls, possibly Piker Hills Fm, Virgin Hills Fm, Windjana Ls or Virgin Hills Fm

*Parvulaltarostrum veeversi* Sartenaer, 1979

*apena* Zone -- Napier Fm

*Phlogoiderhynchus arefactus* (Veevers, 1959)

*torrida* Zone -- Sadler Ls, Sadler Ls or Gogo Fm

*torrida* to *apena* Zone -- Sadler Ls

*proteus* Zone -- Napier Fm

*Plicochonetes macropatus* Veevers, 1959

*torrida* Zone -- Sadler Ls

?*Productella occidua* Veevers, 1959

*saltica* Zone -- Sadler Ls

*Ptychomaletoechia lucida* (Veevers, 1959)

*proteus* Zone -- Bugle Gap Ls, Gumhole Fm, Napier Fm, Piker Hills Fm, "Pillara Ls", Virgin Hills Fm, Windjana Ls

*Pugnax hullensis* Veevers, 1959

*scopimus* Zone -- Virgin Hills Fm (could be Windjana Ls)

*scopimus* Zone? -- Napier Fm, Virgin Hills Fm, Windjana Ls

*Pugnax* sp. cf. *acuminatus* (J. Sowerby, 1882)

*saltica* Zone -- Pillara Ls

*apena* Zone -- Napier Fm

*proteus* Zone -- Napier Fm

*Pugnax* sp cf. *pugnus* (Martin, 1809)

*saltica* Zone -- Bugle Gap Ls?, Sadler Ls

*apena* Zone -- Napier Fm, Sadler Ls

*proteus* Zone -- Bugle Gap Ls, Napier Fm, Piker Hills Fm (could include Virgin Hills Fm)

*Reticulariopsis suchana* (Veevers, 1959)

*ramosa* Zone -- Pillara Ls

? *torrida* Zone -- Sadler Ls



- Rhipidomella incompta* Veevers, 1959  
*proteus* Zone -- Bugle Gap Ls, Napier Fm, Piker Hills Fm, possibly Virgin Hills Fm
- Schizophoria apiculata* Veevers, 1959  
*proteus* Zone -- Piker Hills Fm  
 ? *proteus* Zone -- probably Napier Fm
- Schizophoria pierrensis* Veevers, 1959  
*proteus* Zone -- Bugle Gap Ls, Napier Fm, Piker Hills Fm, Pillara Ls, possibly Virgin Hills Fm  
 ? *scopimus* Zone -- Bugle Gap Ls
- Schizophoria* sp. ind. Veevers, 1959  
*torrida* Zone -- Sadler Ls
- Schizophoria stainbrooki* Veevers, 1959  
*saltica* Zone -- Sadler Ls  
*saltica* or *torrida* Zone -- Sadler Ls  
*torrida* Zone -- Sadler Ls
- Schizophoria* sp. cf. *stainbrooki* Veevers  
*apena* Zone -- Napier Fm  
*proteus* Zone -- Napier Fm, "Pillara Ls"
- Schuchertella dromeda* Veevers, 1959  
*proteus* Zone -- Gumhole Fm, Piker Hills Fm?
- Schuchertella gratillica* Veevers, 1959  
*saltica* Zone -- Sadler Ls  
*saltica* to *torrida* Zone -- Sadler Ls
- Skenidium asellatum* Veevers, 1959  
*saltica* Zone -- Sadler Ls
- Spinatrypina* (*Exatrypa*) *kuniandia* Grey, 1978  
 zonation unknown -- Sadler and possibly Pillara Ls
- Spinatrypina* (*Spinatrypina*) *prideri* (Coleman, 1951) SENSU LATO  
*torrida* Zone -- Sadler Ls, and possibly Windjana Ls  
 ? *proteus* Zone -- "Pillara Ls" -- but see the comment on age (only Frasnian) by Grey, 1978.
- Stringocephalus fontanus* Veevers, 1959  
*fontanus* Zone -- Pillara Ls
- Teichertina fitzroyensis* Veevers, 1959  
*saltica* Zone -- Sadler Ls
- Terebratulacea, gen. et sp. ind. I, Veevers, 1959  
*saltica* Zone -- Sadler Ls
- Terebratulacea, gen. et sp. ind. II, Veevers, 1959  
*scopimus* Zone -- Virgin Hills Fm
- Veeversalasia numida* (Veevers, 1959)  
*saltica* Zone -- Sadler Ls  
*saltica* to *torrida* Zone -- Sadler Ls
- Zophostrophia ungamica* Veevers, 1959  
*saltica* Zone -- Sadler Ls

## SUMMARIES OF STRATIGRAPHIC DISTRIBUTION OF LOCALITIES

This section is designed as a quick reference to the assignment of localities to stratigraphic and biostratigraphic units (in as far as that is known) that I have made in this report. The lists therefore give no details (those can be obtained from the other sections), beyond the name of the 1:100,000 topographic sheet, and where relevant the measured section designation. Localities are in alphanumeric order.

### LOCALITIES GROUPED BY FORMATION

In this first list the arrangement is stratigraphic. Because of the complex stratigraphy of the Lennard Shelf, the formations are in alphabetic order. Those localities which may be in one of several possible formations are grouped accordingly, and those where the formation is highly uncertain are listed at the end, with any appropriate comment. In each group the localities are in alpha-numeric order.

#### Bugle Gap Limestone

K142?	Bohemia	<i>Section DP2</i> —	
K144?	Bohemia	K179	Bohemia
K145?	Bohemia	K180	Bohemia
<i>Section DB1</i> —		K181	Bohemia
K159	Bohemia		
K160	Bohemia		
K166	Bohemia		
K167	Bohemia		
K168	Bohemia		
K169	Bohemia		
K170	Bohemia		

#### Fairfield Group (probably Gumhole Limestone)

KP168 Lennard

#### Gogo Formation

K98	Bohemia	<i>Section DP2</i> —	
K126?	Bohemia	K173?	Bohemia

#### Gumhole Limestone

K282	Cunningham	KP156	Ellendale
K283	Cunningham	KP157	Ellendale
<i>Section DF2</i> —		KP164?	Ellendale
K290	Elma	KP181?	Ellendale
K291	Elma	Ld25	Ellendale
K292	Elma	Ld26	Ellendale
<i>Section DL2</i> —		M2?	Lennard
K318?	Elma	M3?	Lennard
<i>Section DLI</i> —		M8?	Lennard
K341	Elma	M9	Lennard
		T2	Cunningham

#### Gumhole or "Pillara" Limestone

K287	Elma	K288	Elma
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#### "Mount Pierre Group"

K121	Bohemia	K172	Bohemia ( <i>Gogo Fm?</i> )
		K174	Bohemia ( <i>Gogo Fm?</i> )

**Napier Formation**

F32?	Lennard	Ld9	Ellendale
F33	Lennard	Ld11	Leopold Downs
K285	Fitzroy Crossing	Ld16	Leopold Downs
K506?	Fitzroy Crossing	Ld17	Leopold Downs
K539	Leopold Downs	Ld20	Leopold Downs
K551?	Leopold Downs	Ld28	Leopold Downs
KP72	Lennard	Ld29	Leopold Downs
KP84	Leopold Downs	Ld30	Leopold Downs
KP101	Leopold Downs	Ld31	Leopold Downs
KP103	Leopold Downs	Ld32	Leopold Downs
KP106	Leopold Downs	Ld33	Leopold Downs
KP107	Leopold Downs	S4/91	Leopold Downs
KP109	Leopold Downs	O/73	Leopold Downs
KP111?	Leopold Downs	T4	Fitzroy Crossing
KP134	Leopold Downs	T5	Fitzroy Crossing
KP140	Leopold Downs	T9?	Elma
KP141	Leopold Downs		
KP143	Leopold Downs		
KP144	Leopold Downs		
KP149	Cunningham		
KP150	Hooper		
KP152	Leopold Downs		
KP167	Ellendale		

**Napier Formation or Windjana Limestone**

T1 Hooper

**Piker Hills Fm**

<i>Section DF3</i> —		T11	Fitzroy Crossing
K319	Elma	T12	Fitzroy Crossing
K320	Elma	T25	Fitzroy Crossing
K322	Elma	T26	Fitzroy Crossing

**Pillara Limestone**

F29	Lennard	<i>Section DMP5</i> —	
<i>Section DMP2</i> —		K571	Lennard
K209	Bruten	K572	Lennard
K210	Bruten	K573	Lennard
K300	Fitzroy Crossing	Ld8?	Ellendale
K301	Fitzroy Crossing	Ld21	Leopold Downs
K438	Fitzroy Crossing	O/76	Leopold Downs
K463	Fitzroy Crossing	O/78?	Leopold Downs

**"Pillara Limestone" (≈ Nullara Limestone)**

<i>Section DF2</i> —	
K289	Elma
<i>Section DL2</i> —	
K315	Elma
<i>Section DL1</i> —	
K340	Elma
K503	Hooper

**Sadler Limestone**

K103	Bohemia	<i>Section DD2</i> —	
K112	Bohemia	K235	Bruten
K147?	Bohemia	K236	Bruten
K148	Bohemia	K237	Bruten
K150	Bohemia	K238	Bruten
K153	Bohemia	K239	Bruten
K154	Bohemia	K240	Bruten
<i>Section DMP2</i> —		K241	Bruten
K213	Bruten	K242	Bruten
<i>Section DD1</i> —		K243	Bruten
K214	Bruten	K244	Bruten
K215	Bruten	K245	Bruten
K216	Bruten	K246	Bruten
K217	Bruten	K247	Bruten
K218	Bruten	K248	Bruten
K219	Bruten	K249	Bruten
K220	Bruten	K250	Bruten
K221	Bruten	K251	Bruten
K222	Bruten	K252	Bruten
K223	Bruten	K253	Bruten
K224	Bruten	<i>Section DD3</i> —	
K225	Bruten	K264	Fitzroy Crossing
K226	Bruten	K265	Fitzroy Crossing
K227	Bruten	K266	Fitzroy Crossing
K228	Bruten	K267	Fitzroy Crossing
K229	Bruten	K268	Fitzroy Crossing
K230	Bruten	K269	Fitzroy Crossing
K231	Bruten	K270	Fitzroy Crossing
		K271	Fitzroy Crossing
		K272	Fitzroy Crossing
		K273	Fitzroy Crossing
		K274	Fitzroy Crossing
		K275	Fitzroy Crossing
		K276	Fitzroy Crossing
		K480?	Elma
		T53	Bruten
		T58	Bruten
		T61?	Bohemia

**Sadler Limestone or Gogo Formation**

T57      Bruten

**Sadler or Pillara Limestone**

T31      Fitzroy Crossing

**Sadler or possibly Windjana Limestone**

T54      Bruten

**Virgin Hills Formation**

K108	Bohemia	K356	Elma
K135?	Bohemia	T18	Fitzroy Crossing
K177	Bohemia	T39	Fitzroy Crossing
K327	Elma	T40	Fitzroy Crossing
K355?	Elma	T42?	Fitzroy Crossing

Virgin Hills or Piker Hills Formation			
T19	Fitzroy Crossing	T27	Fitzroy Crossing

**Virgin Hills Formation or possibly Windjana Limestone**  
T69                      Bohemia

Windjana Limestone			
F34	Lennard	O/66	Leopold Downs
Ld10	Leopold Downs	O/67	Leopold Downs
Ld19	Leopold Downs	O/77	Leopold Downs

**Windjana or possibly Pillara Limestone**  
G23                      Bohemia

### LOCALITIES GROUPED BY ZONE

In this second list the arrangement is biostratigraphic. The zones are in order from oldest to youngest. Where localities lie in part of a section where the zonal boundary is uncertain, or where the fauna is such that there is a range of possible zones, those localities are grouped separately. Section codes are given, as well as formation name. Localities where the zonal position cannot even be estimated are grouped at the end. For each group the localities are in alpha-numeric order.

***Stringocephalus fontanus* Zone**  
K438                      Pillara Limestone

<b><i>Amphipora ramosa</i> Zone</b>			
K209 (DMP2)	Pillara Limestone	K463 (DMP1)	Pillara Limestone
K210 (DMP2)	Pillara Limestone		

**Below definite *Ladjia saltica* Zone in section DD3**

K264	Sadler Limestone	K267	Sadler Limestone
K265	Sadler Limestone	K268	Sadler Limestone
K266	Sadler Limestone	K269	Sadler Limestone

<b><i>Ladjia saltica</i> Zone</b>			
K144	Bugle Gap Limestone?	K245 (DD2)	Sadler Limestone
K213 (DMP2)	Sadler Limestone	K270 (DD3)	Sadler Limestone
K214 (DD1)	Sadler Limestone	K271 (DD3)	Sadler Limestone
K215 (DD1)	Sadler Limestone	K272 (DD3)	Sadler Limestone
K216 (DD1)	Sadler Limestone	K273 (DD3)	Sadler Limestone
K235 (DD2)	Sadler Limestone	K274 (DD3)	Sadler Limestone
K236 (DD2)	Sadler Limestone	K275 (DD3)	Sadler Limestone
K237 (DD2)	Sadler Limestone	K276 (DD3)	Sadler Limestone
K238 (DD2)	Sadler Limestone	K571? (DMP5)	Pillara Limestone
K239 (DD2)	Sadler Limestone	K572? (DMP5)	Pillara Limestone
K240 (DD2)	Sadler Limestone	K573? (DMP5)	Pillara Limestone
K241 (DD2)	Sadler Limestone	O/67?	Windjana Limestone
K242 (DD2)	Sadler Limestone	O/76	Pillara Limestone
K243 (DD2)	Sadler Limestone	O/78	Pillara Limestone?
K244 (DD2)	Sadler Limestone	T53	Sadler Limestone

*Ladjia saltica* to *Emanuella torrida* Zone

K98	Gogo Formation	K246 (DD2)	Sadler Limestone
K112	Sadler Limestone	K247 (DD2)	Sadler Limestone
K121	"Mount Pierre Group"	K248 (DD2)	Sadler Limestone
K126 (DP3)	Gogo Formation?	K249 (DD2)	Sadler Limestone
K172	"Mount Pierre Group"	K250 (DD2)	Sadler Limestone
K173 (DP2)	Gogo Formation?	K251 (DD2)	Sadler Limestone
K174	"Mount Pierre Group"	K252 (DD2)	Sadler Limestone
K217 (DD1)	Sadler Limestone	K253 (DD2)	Sadler Limestone
K218 (DD1)	Sadler Limestone	K480	Sadler Limestone?
K219 (DD1)	Sadler Limestone	Ld8	Pillara Limestone?
K220 (DD1)	Sadler Limestone	T9	Napier Formation?

*Emanuella torrida* Zone

K221 (DD1)	Sadler Limestone	K228 (DD1)	Sadler Limestone
K222 (DD1)	Sadler Limestone	K229 (DD1)	Sadler Limestone
K223 (DD1)	Sadler Limestone	K230 (DD1)	Sadler Limestone
K224 (DD1)	Sadler Limestone	T54	Sadler (possibly Windjana) Limestone
K225 (DD1)	Sadler Limestone		
K226 (DD1)	Sadler Limestone	T57	Sadler Limestone or Gogo Formation
K227 (DD1)	Sadler Limestone	T58	Sadler Limestone

*Emanuella torrida* to *Crurithyris apena* Zone

K231 (DD1) Sadler Limestone

*Crurithyris apena* Zone

F33	Napier Formation	G23	Windjana or Pillara Limestone
K103 (DUS1)	Sadler Limestone	Ld21?	Pillara Limestone
K147	Sadler Limestone?	Ld31	Napier Formation
K148	Sadler Limestone	Ld33	Napier Formation
K150	Sadler Limestone	O/73	Napier Formation
K153	Sadler Limestone	T61	Sadler Limestone
K154	Sadler Limestone		

*Nyege scopimus* Zone

K145	Bugle Gap Limestone?	Ld17	Napier Formation
K159 (DB1)	Bugle Gap Limestone	Ld20	Napier Formation
K160 (DB1)	Bugle Gap Limestone	Ld29?	Napier Formation
K166 (DB1)	Bugle Gap Limestone	Ld30	Napier Formation
K167 (DB1)	Bugle Gap Limestone	O/77?	Windjana Limestone
K168 (DB1)	Bugle Gap Limestone	T18	Virgin Hills Formation
K181 (DP2)	Bugle Gap Limestone	T19	Virgin Hills or Piker Hills Formation
K356?	Virgin Hills Formation		
KP72	Napier Formation	T39	Virgin Hills Formation
KP106?	Napier Formation	T40	Virgin Hills Formation
KP141	Napier Formation	T42	Virgin Hills Formation?
KP150?	Napier Formation	T69	Virgin Hills Formation (or Windjana Limestone?)
Ld16	Napier Formation		

*Nigerinoplica proteus* Zone

F34	Windjana Limestone	KP143	Napier Formation
K169 (DB1)	Bugle Gap Limestone	KP144	Napier Formation
K170 (DB1)	Bugle Gap Limestone	KP149	Napier Formation
K179 (DP2)	Bugle Gap Limestone	KP156	Gumhole Limestone
K180 (DP2)	Bugle Gap Limestone	KP157	Gumhole Limestone
K282	Gumhole Limestone	KP164	Gumhole Limestone?
K283	Gumhole Limestone	KP167	Napier Formation
K285	Napier Formation	KP168	Fairfield Group (Gumhole Limestone?)
K287	Gumhole or "Pillara" Limestone		
K288	Gumhole or "Pillara" Limestone	KP181	Gumhole Limestone?
K289 (DF2)	"Pillara" Limestone	Ld9	Napier Formation
K290 (DF2)	Gumhole Limestone	Ld10	Windjana Limestone
K291 (DF2)	Gumhole Limestone	Ld11	Napier Formation
K292 (DF2)	Gumhole Limestone	Ld25	Gumhole Limestone
K315 (DL2)	"Pillara" Limestone	Ld26	Gumhole Limestone
K318 (DL2)	Gumhole Limestone?	Ld28	Napier Formation
K319 (DF3)	Piker Hills Formation	Ld32	Napier Formation
K320 (DF3)	Piker Hills Formation	M2	Gumhole Limestone?
K322	Piker Hills Formation	M3	Gumhole Limestone?
K327	Virgin Hills Formation	M8	Gumhole Limestone?
K340 (DL1)	"Pillara" Limestone	M9	Gumhole Limestone
K341 (DL1)	Gumhole Limestone	S4/91?	Napier Formation
K355?	Virgin Hills Formation?	T1	Napier Formation or Windjana Limestone
K503	"Pillara" Limestone		
K506 (DS2)	Napier Formation?	T2	Gumhole Limestone
K551 (DF8)	Napier Formation?	T4	Napier Formation
KP84	Napier Formation	T5	Napier Formation
KP101	Napier Formation	T11	Piker Hills Formation
KP103	Napier Formation	T12	Piker Hills Formation
KP107	Napier Formation	T25	Piker Hills (plus Virgin Hills?) Formation
KP109	Napier Formation		
KP111?	Napier Formation?	T26	Piker Hills Formation
KP140	Napier Formation	T27	Piker Hills or Virgin Hills Formation

## Zone unknown

F29	Pillara Limestone	KP134	Napier Formation
F32	Napier Formation?	KP152	Napier Formation
K108	Virgin Hills Formation	Ld19	Windjana Limestone
K135	Virgin Hills Formation?	O/66	Windjana Limestone
K142	Bugle Gap Limestone?	T31	Sadler or possibly Pillara Limestone
K300	Pillara Limestone		
K301	Pillara Limestone		

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