BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

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LATE PALAEOZOIC AND EARLY MESOZOIC ROCKS IN THE NORTHEASTERN PART OF THE CENTRAL EROMANGA BASIN.

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ABSTRACT

A rapid analysis of data from approximately thirty deep well sections in the northeastern part of the central Eromanga Basin has indicated the regional distribution, and thickness trends, of Devonian rocks of the Adavale Basin, and late Carboniferous, Permian and Triassic rocks of the Galilee Basin, and has also indicated the provenance of the arenaceous sediments particularly those in the Galilee Basin.

Continental and marine Devonian rocks of the Adavale Basin were deposited during a trangessive/regressive cycle and are preserved in faulted wedges unconformably beaneath the Galilee and Eromanga Basin sequences. The thickest sedimentary sequence is preserved west of the Pleasant Creek Arch. Halokinesis in the Boree Salt Member adjacent to the Pleasant Creek Arch has severely dilated the evaporite beds, and modified the structure of the adjacent sediments.

The thickness of the Late Carboniferous, Permian and Triassic rocks of the Galilee Basin generally decreased to the southwest. Sand isolith and sand percentage contours indicate the provenance of these sediments lay in the northeast in the Drummond Basin and Anakie Inlier. The Joe Joe Group in the southern Galilee Basin has been identified mostly as Jericho Formation. The strong evidence for continental wide glacial activity during the Early Permian may account for the wider distribution of the Jericho Formation compared to the young formations of the Joe Joe Group.

The Bandanna Formation comprises interbedded sandstone, shale and coal in the northeast where it is separated from the Colinlea Sandstone by the marine Peawaddy Formation and Black Alley Shale. The lithofacies of Upper Stage 5 age changes to a very thin sequence of predominantly shale and coal in the south and west adjacent to the Canaway Ridge; the precise

identification of the formation here is uncertain and it is referred to as Bandanna Formation equivalent. This lithofacies change suggests a gradation in depositional environment from lower delta plain and delta front in the northeast to marginal swamp deposits of an upper delta plain in the south and west towards the boundary with the Cooper Basin.

INTRODUCTION

An outline of the Australia central Eromanga Basin Project is given by Moss and Wake-Dyster (1983), Moss et al., (1981), and Moss (1982 and 1983). The project is a multidisciplinary study of the structural and depositional history of the central Eromanga Basin in southwestern Queensland; it covers an area of about 335,000 sq km and lies between latitudes 24° to 29°, and longitudes 141° and 147° E (Fig. 1).

The objective of the short investigation reported in this record was to appraise the subsurface stratigraphic data in the northeastern part of the central Eromanga Basin as a contribution to the Australian central Eromanga Project. This area includes the superimposed sedimentary sequences of the Adavale and southern Galilee Basins. The aim was to determine the thickness distribution of the major stratigraphic units in these two basins and in addition ascertain the provenance and depositional environment of the arenaceous Permo-Carboniferous and Triassic units in the southern Galilee Basin. The composite logs of approximately 30 petroleum exploration wells in the region were examined, and formation boundaries refined where necessary. The interpretation of provenance was based principally on determination of the sand fraction in the formation and lithofacies changes. The estimate of sand fraction was made from gamma ray logs for the Triassic and Permo-Carboniferous sequences. The data so obtained were plotted as sand isoliths (Figs 19-22) and sand iso-percentage contours (Figs. 23-26). Together with isopach maps for each formation in the Galilee Basin (Figs 5-9); the thickness of the Devonian Adavale Basin formations is given in Figures 10-18. Cross section locations, cross sections, and two cross section plots for the south Galilee Basin are shown in Figure 28.

The locations of wells used for the Eromanga data base are indicated on the accompanying sheets and in Figure 2. In most cases it was possible to draw approximate contours on the selected values even though at the time of compilation no new seismic sections were available to supplement the data base. However in some instances the data points were too widely scattered for contouring.

REGIONAL GEOLOGY AND GEOPHYSICS

The sedimentary sequences in the area (Table 1) range in age from Early to Late Devonian (Adavale Basin) Late Carboniferous to Late Triassic (Galilee Basin) and Early Triassic to Late Cretaceous (Eromanga Basin). The Adavale Basin sequence is entirely concealed but some units of the Galilee and Eromanga Basins are exposed in the northeast.

The stratigraphy of each of the principal sedimentary provinces is discussed in recent publications as follows: Paten (1977) - Adavale Basin; Hawkins (1978); Jackson et al (1981); Wells (1984) - Galilee Basin; and Senior et al (1978) - Eromanga Basin.

Information on the regional geophysical coverage of the central Eromanga Basin is given in Moss and Wake-Dyster (1983).

The regional structural setting of the central Eromanga Basin is shown in Figure 1 and the more detailed structure of the northeastern part of the area that is the subject of this report is shown in Figure 3. The location and identification of wells that were used in the interpretation of isopachs and estimation of sand fraction are shown in Figure 2.

STRATIGRAPHY AND LITHOFACIES

The stratigraphy of the southern part of the Galilee Basin and underlying sequences of the Adavale Basin have been discussed by several authors (see above). These superimposed sedimentary provinces underlie the northeastern part of the central Eromanga Basin. Only the broad features of the lithological units will be given, followed by a general description of the main results and inferences derived from the broad review of well data.

Adavale Basin

Basement

Economic basement is generally considered to be the Early Devonian Gumbardo Formation, a unit comprising red-beds and underlying volcanics. True basement comprises Ordovician low grade metamorphic rocks and volcanics and Silurian granite of the Thompson Orogen.

Basement identification are indicated on Figure 4. Dates of 417, 420, 429 and 480 Ma (Silurian and Ordovician) have been obtained from bottom hole cores. Early Palaeozoic basement was not reached in a number of wells and many terminated instead in the Early Devonian Gumbardo Formation or higher in the sequence. The continours on Pre-Devonian basement (Fig. 4) therefore can only be regarded as very approximate.

Devonian

The stratigraphic nomenclature adopted is that of Paten (1977), and his interpretation is probably the most recent synthesis of the regional geology. Paten's interpretation suggests that the Adavale Basin sequence was deposited in a gross transgressive-regressive cycle reflecting the westward advance and subsequent retreat of a Devonian sea. Transgression reached a maximum about the middle Devonian at which time widespread thin dolomite beds were deposited in its shoreward facies.

The interpreted formation thicknesses from well logs are presented as isopachs (Figs. 10-18) although in some cases there were insufficient data available to draw contours on the formation.

Evaporite Sequence

An evaporite unit, the Boree Salt Member of the Etonvale Formation, was deposited during the Middle to Late Devonian in a barred basin restricted by an uplift along the Pleasant Creek Arch. Restriction

of the barred basin probably continued with enhancement of the arch by carbonate sedimentation along the Quilberry-Dartmouth trend (Paten, 1977). Several hundred metres of halite accumulated to form the Boree Salt Member which has been mobilised along the western flank of the Pleasant Creek Arch to form salt pillows; also salt diapis have been postulated (Fig. 3) corresponding to the position of the Bury 1 and Dartmouth 1 wells. Over 580 m of halite was penetrated in the Bury 1 well.

Further details of the evaporites are given in Wells (1980).

Isopachs

Insufficient data were available to draw isopachs on all the Adavale Basin stratigraphic units. In addition some of the formation intervals are largely preserved thickness rather than depositional thickness, and conversely the halite intervals are abnormally thickened by halokinesis.

The thickness variation from well data are as follows:-

	Maximum penetrated thickness (m)	Minimum penetrated thickness (m)
Gumbardo Fm.	745 (Gumbardo 1)	19 (Leopardwood 1)

The formation is preserved in three depocentres at Gumbardo, Carlow and Allandale arranged in line parallel to the Pleasant Creek Arch.

Eastwood Beds	875 (Carlow 1)	32 (Brynderwyn 1)

The maximum preserved thickness occurs in the Allandale/Carlow area in the north.

Log Creek Formation (Lower)	350+ (Gilmore 1)	119 Lon Ck 1)

Log Creek Formation (Upper)	610 (Quilberry 1)	184 (Gilmore 1)
Lissoy Sandstone	184 (Log Ck 1)	?18 (Yongala 1)
		58 (Gumbardo 1)
Cooladdi Dolomite	604 (Quilberry 1) (Bury Lst.)	14 (Gilmore 1)
Etonvale Formation	(Sst./Salt Mbr.) 585 (Bury 1)	73 (Grey Range 1)
Etonvale Formation	(Shale/Siltstone) 614 (Stafford 1)	88 (Cothalow 1)
Buckabie Formation	1729 (Leopardwood 1)	27 (Quilberry 1)

Permo-Carboniferous and Triassic rocks were intersected throughout the southern part of the Galilee Basin and the range of thicknesses penetrated is as follows:-

	Maximum thickness (m)	Minimum thickness (m)
Permo-Carboniferous	954 (Allandale 1)	5 (Budgerigar 1)
		? Toolachee Fm.
Joe Joe Group	805 (Allandale 1)	58 (Cothalow 1)
	Jochmus Fm.	
Bandanna Formation and equivalent		
	114 (Allandale 1)	5 (Budgerigar 1)
		? Toolachee Fm.
Colinlea Sandstone	49 (Birkhead 1)	35 (Allandale 1)
Clematis Sandstone	550 (Valetta 1)	9 (Bonnie 1)
Moolayember Formation	234 (Allandale 1)	3 (Etonvale 1)

Galilee Basin

Late Carboniferous and Early Permian (Stages 1, 2, and 3)

The late Carboniferous and Early Permian stratigraphy of the southern part of the Galilee Basin has not received a great deal of attention but the regional geological setting has been described by Jackson et. al. (1981) and Gray (1976).

Joe Joe Group

The Joe Joe Group has been divided into four formations (Table 1) but only the Jericho Formation has been identified in the southern Galilee Basin. The reason for the wide distribution ofthis formation is uncertain. There is insufficient information to draw sand-isoliths, and sand isopercentage maps suggest several depocentres of sand deposition. The general trend appears to be towards a decrease in sand content to the southwest but the wide scatter of data makes the results inconclusive. Cross sections (Figs. 27 to 30) show a rapid decrease in thickness of the Group to the southwest. The decrease in thickness and lithofacies evidence outside the area indicate a provenance to the northeast.

Late Permian (Upper Stage 5)

The upper Stage 5 sediments were deposited during one transgressive/regressive cycle with the marine phase reaching a peak when the Black Alley Shale and Peawaddy Formation were deposited. The Peawaddy Formation and Black Alley Shale separate continental sediments comprising the Colinlea Sandstone and younger Bandanna Formation in the northeast, but in areas not reached by the marine incursions the Upper Stage 5 rocks are referred to as Bandanna Formation equivalent.

Colinlea Sandstone

The Colinlea Sandstone (Mollan et al 1969) comprises fine to medium grained, quartzose, cross-bedded sandstone, granule to pebble conglomerate, commonly near the base of the formation, and thin interbeds of siltstone. The formation is distinguishable only in the extreme northeastern part of the area and Allandale 1 is the most westerly well with identified Colinlea Sandstone. Here it comprises 35 m of interbedded sandstone and shale with siltstone and tuffaceous sediments with a trace of coal.

Bandanna Formation and equivalent

The Bandanna Formation (Hill, 1957) has been divided into a lower unit of mainly shale and an upper unit of friable, in part calcareous clay, coal and oil shale. The Late Permian marine transgression did not reach the southern part of the Galilee Basin and the continental sediments of Upper Stage 5 age in this region cannot be differentiated. Because of their lithological similarity to the Bandanna Formation the interval is tentatively designated as Bandanna Formation equivalent but uncertainty remains as to whether the whole interval corresponds to the Bandanna Formation or whether it contains some sediments that can be identified with the Colinlea Sandstone.

In the extreme southern and western parts of the Galilee Basin the Bandanna Formation and equivalent gradually thin to only 6 m of dark grey to black, very carbonaceous shale and minor sandstone. In Yongala 1, adjacent to the Canaway Ridge the equivalent unit contains about 30% coal: in Yongala 2, coal comprises about 50% of the formation and the remainder consists of light grey silty carbonaceous shale and coarse to very coarse lignitic sandstone; in Budgerigar 1 the Late Permian sequence comprises abot 5m of coal and carbonaceous shale.

Hence in the area near the boundary with the Cooper Basin the Upper Permian interval is lithologically distinct from the Bandanna Formation and has been equated with the Toolachee Formation by some authors. The Toolachee Formation correlates with the upper part of the Colinlea Sandstone and the Bandanna Formation.

The thickness of the Bandanna Formation is fairly uniform throughout the southern Galilee Basin. Slightly thickened wide lobes occur on the Springsure Shelf and eastern margin of the Canaway Ridge, and southwesterly trending elongated lobes occur roughly in line with the

northern continuation of the Pleasant Creek Arch.

Sand isoliths indicate a regional trend of decrease in total sand thickness into the south Galilee Basin. The sand isopercentage map does not show a clear trend and rather irregular concentrations of sand content are apparent. This irregular distribution may reflect the preservation of channel sands.

The Bandanna Formation was deposited in a fluvial environment. The regional distribution of lithofacies in the upper Stage 5 units indicate that fluvial and upper delta plain deposition over a large part of both the northern and southern Galilee Basin grades into upper and lower delta plain deposits in the area of the Springsure Shelf where marine intercalations occur. The carbonaceous fine grained deposits of the western part of the south Galilee Basin are probably marginal swamp deposits in a predominantly upper delta plain environment grading into lower delta front deposits further northeast towards the Springsure Shelf.

Triassic

Moolayember Formation

The Moolayember 'Shale' of Reeves (1947) was renamed Moolayember Formation by Mollan et al (1972). The formation comprises green=brown lithic sandstone with bedded green-brown mudstone. Elsewhere conglomerate, tuff and sandstone may be present; conglomerate is more abundant in the east. The formation decreases in thickness to the southwest across the south Galilee Basin. It is up to 1500 m thick in the Taroom Trough, 300 m on the Springsure Shelf and only a few metres thick in the central part of the southern Galilee Basin.

The middle-Triassic Moolayember Formation was deposited in a continental fluvial environment with some possible lacustrine intercalations. Volcanism was contemporaneous with sedimentation in the east where the sediments were largely derived from a volcanic terrain, no volcanic material is obvious in the formation in the south Galilee Basin.

The decrease in thickness and sand content to the southwest indicates a northeasterly provenance.

Clematis Sandstone

The Clematis Sandstone (Jensen, 1926) was redefined as a Group (Jensen, 1975) to include the Glenidal Formation and Expedition Sandstone. Because this interval has not been subdivided in the well sequences the term Clematis Sandstone as used in the well completion reports is retained here.

The formation was deposited by a system of braided and meandering channels that spread sand southwards and soils developed in early Clematis time. The formation decreases in thickness from 800 m in the Dawson Range, to 100 m on the Springsure Shelf. It is up to 550 m thick in the southern part of the Galilee Basin and only a few metres thick in the southwest.

The decrease in thickness to the southwest (Fig. 6), and corresponding decrease in sand fraction (Fig. 20) indicate a northeasterly source. The irregular distribution of sand percentage (Fig. 24) may indicate major channel sand deposition.

SUMMARY

Summary maps are presented that indicate the distribution and thickness of sedimentary units in the Adavale and southern part of the Galilee Basin that underlie the northeastern part of the central Eromanga

Basin. In addition the depth and identification of basement rocks is presented and sand isolith and isopercentage contours for the Permo-Carboniferous and Triassic rocks were estimated semi-quatitatively from wireline logs and contoured where possible.

The Devonian rocks of the Adavale Basin were deposited during a transgressive - regressive cycle with a marine incursion progressing westwards and subsequently retreating. The sediments are preserved in fault bounded and folded troughs, and although the thickness of the units may be in part only the preserved thickness, or locally affected by salt doming, the isopachs are taken to indicate regional thickness trends. The thickest sequence occur adjacent to, or at a little distance west of the Pleasant Creek Arch, a late Devonian uplift which now marks the eastern limit of the largest area of Devonian sediments. The principal depocentres were in the Blackwater and Cooladdi Troughs and Lorne Depression.

Halokinesis is evident in the Boree Salt Member of the Etonvale Formation and two and possibly more salt diapirs occur in the area adjacent to the Pleasant Creek Arch. The thickness of the Boree Salt Member is extremely dilated and the formation of domes and pillows has undoubtedly affected the structural expression of adjacents sediments in the area.

The overlying Permo-Carboniferous and Triassic rocks are predominantly continental in origin. The earliest sedimentation (Stages 1 to 3) includes fluvial, lacustrine and glacial sediments of the Joe Joe Group. In the southern part of the Galilee Basin the Group has not been studied in detail but mostly has been identified as the Jericho Formatio of Late Stage 1 to Early Stage 2 age, although in a few well sections the Group has not been differentiated. The reason for the wider distribution of this formation compared to the remaining formations of the Group is not clear. The influence of glaciation may have been more pronounced during

this interval.

A time break spanning Stages 4 to Upper Stage 5a with no sedimentation intervened before the deposition of Upper Permian (Upper Stage 5) sediments. These rocks were deposited during one transgressive - regressive cycle with a marine phase reaching a peak during Upper Stage 5 time when the Black Alley Shale and Peawaddy Formation were deposited. The marine incursion is well developed on the Springsure Shelf and extended for a considerable distance into the northern part and to a lesser extent into the southern part of the Galilee Basin but the precise limits of the marine transgression are unknown. In places where the transgression is not evident the Upper Stage 5 sediments cannot be differentiated and because of their lithological similarity to the Bandanna Formation they are referred to as Bandanna Formation Equivalent.

The predominant shale and coal of the southwesterly Bandanna Formation equivalent probably represents marginal swamp deposition in an upper delta plain environment grading into lower delta plain deposition towards the Springsure Shelf.

The sand isolith, sand percentage and isopach maps for the Permo-Carboniferous of the southern Galilee Basin indicate that the principal source of sediments lay to the northwest probably mainly from uplifted parts of the Devonian Drummond Basin and early to mid-Palaeozoic rocks of the Anakie Inlier. The form of the sand isolith and percentage contours suggest the presence of major drainage channels in this region.

Triassic rocks of the southern Galilee Basin are dominantly fluvial in original with evidence in places of lacustrine deposition. Isopachs, sand isoliths and percentage again indicate a northeasterly source.

ACKNOWLEDGEMENTS

The estimation of sand fraction in the Galilee Basin sequences was made in part by Steve Newhouse who also compiled isopach and sand thickness and percentage data on the Eromanga Basin base maps.

REFERENCES

Gray, A.R.G., 1976 - Stratigraphic relationships of Late Palaeozoic sediments between Springsure and Jericho. Queensland Government Mining Journal, 77, (894), 146-163.

Hawkins, P.J., 1978 - Galilee Basin - review of petroleum prospects Queensland Government Mining Journal, 79, 96-112.

Hill, Dorothy, 1957 - Explanatory notes on the Springsure 4-mile geological Sheel. Bureau of Mineral Resources Australia Note Series 5.

Jackson, K.S., Horvath, Z., & Hawkins, P.J., 1981 - An assessment of the petroleum prospects for the Galilee Basin, Queensland. Australian Petroleum Exploration Association Journal, 21, (1), 172-186

Jensen, H.I. 1926 - Geological reconnaisance between Roma, Springsure, Tambo and Taroom. Geological Survey of Queensland Publication. 277, 215.

Jensen, A.R., 1975 - Permo-Triassic stratigraphy and sedimentation in the Bowen Basin, Queensland. Bureau of Mineral Resources Australia Bulletin, 154.

Mollan, R.G., Forbes V.R., Jensen, A.R., Exon, N.F., & Gregory, C.M., 1972 - Geology of the Eddystone and the western part of the Mundubbera 1:250 000 Sheet area. Bureau of Mineral Resources Australia Report 142.

Moss, F.J., 1982 - The central Eromanga Basin project - A contribution to the regional study of the Eromanga and underlying basins. In: P.S. Moore and T.J. Mount (Compilers), Eromanga Basin Symposium, summary papers. Geological Society of Australia, Petroleum Exploration Society of Australia, Adelaide, S.A., 44-45.

Moss, F.J., 1983 - The central Eromanga Basin project. In: BMR BMR 82, Year-book of the Bureau of Mineral Resources, Geology and Geophysics, Canberra, A.C.T.

Moss, F.J., & Wake-Dyster, K.D., 1983 - The Australia central Eromanga Basin Project : An introduction. Tectonophysics, 100 (1983), 131-145.

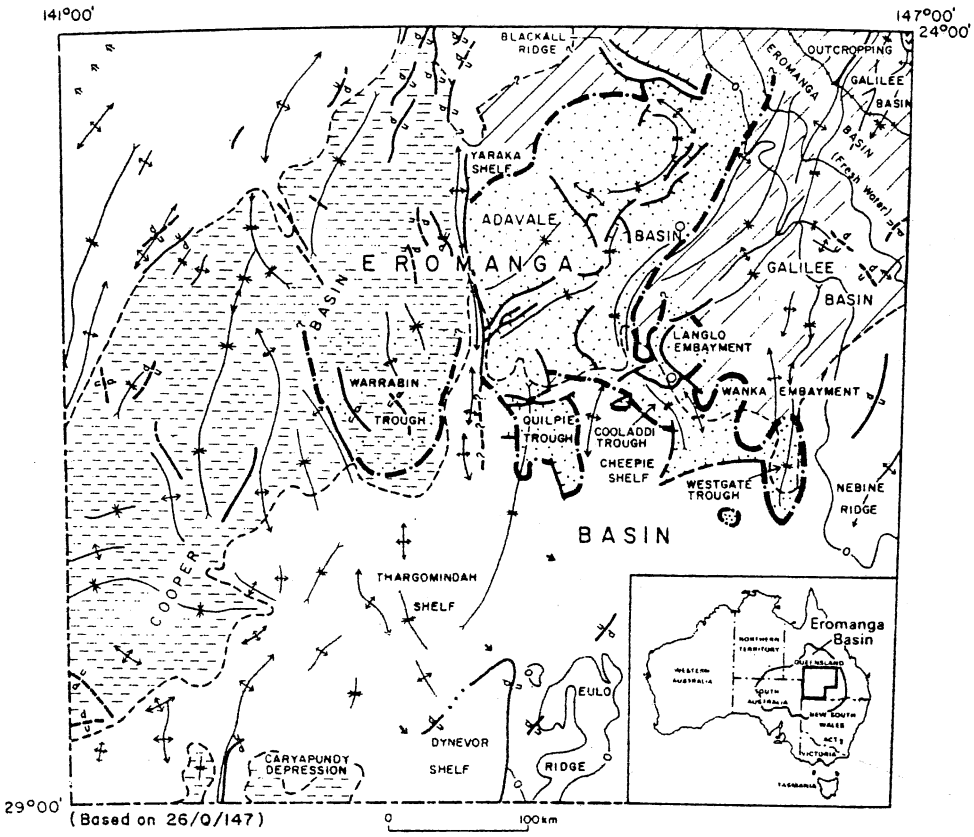
Paten, R.J., 1977 - The Advale Basin, Queensland : Proceedings of symposium, Petroleum in Queensland : a stocktake for the future. November 1977. Petroleum Exploration Society of Australia, Queensland Branch, Brisbane.

Senior, B.R., Mond, A., & Harrison, P.L., 1978 - Geology of the Eromanga Basin. Bureau of Mineral Resources, Australia, Bulletin 167.

Swindon, V.G., 1968 - Case history - Roma area. Australian Petroleum Exploration Association Journal, 8, 120-9.

Wells, A.T., 1980 - Evaporites in Australia. Bureau of Mineral Resources, Australia, Bulletin 198.

Wells, A.T., 1984 - Stratigraphy and Permian coal measures of the Galilee Basin, Queensland. In - Permian Coals of Eastern Australia NERDDC Project 78/2617. CSIRO Division of Fossil Fuels and BMR Division of Continental Geology, 1982-3 10.1-10.49.



Cooper Basin

Adavale Basin (overlain by Galilee)

Outcrop margin of Eromanga Basin

Zero structure contour on base of Rolling Downs Group (datum M.S.L.)

Anticline axis with plunge direction

Syncline axis with plunge direction

Monocline

Fault cutting Eromanga Basin and older rocks

Thinning of Eromanga Basin rocks towards the Boulia Shelf

Galilee Basin

Outcropping Drummond Basin

Thinning of Eromanga Basin rocks towards Dynevor, Cunnamulla Shelves and Eulo Ridge

Concealed truncated margin of Permo-Triassic Cooper and Galilee Basins

Fault cutting pre Eromanga Basin rocks

Margin of Adavale Basin and equivalents

Fault cutting Adavale Basin rocks

Salt diapir in Adavale Basin rocks

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Fig. 1. Locality map

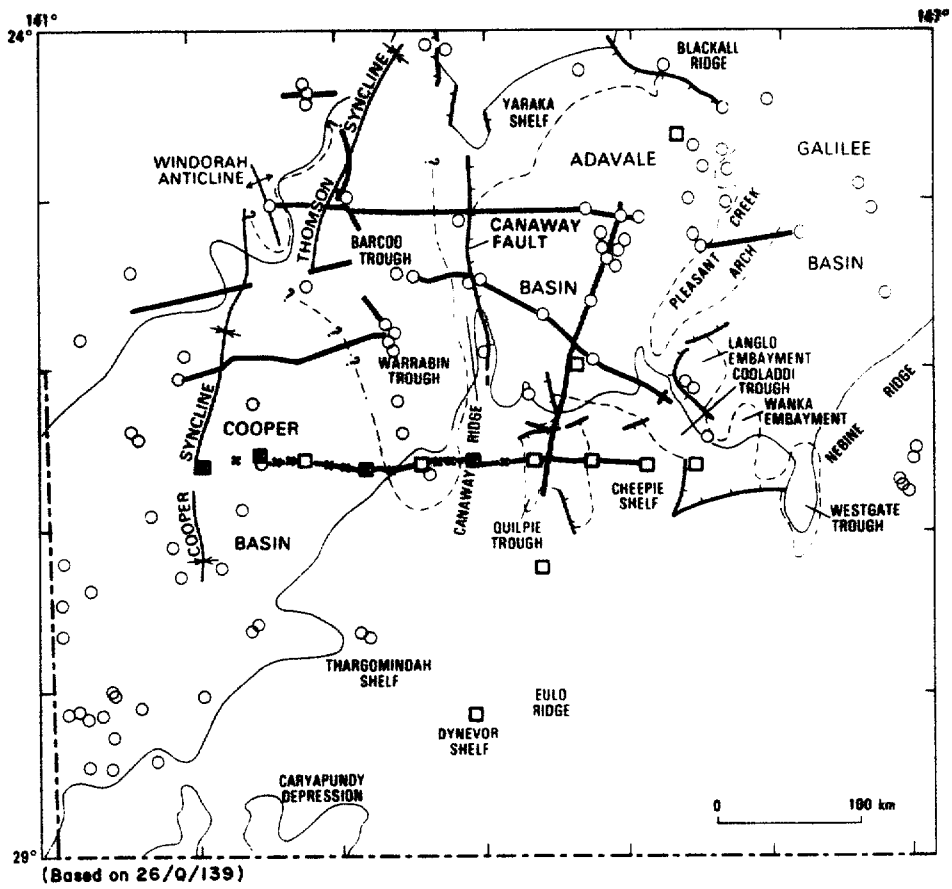


Fig. 2. **Well location**

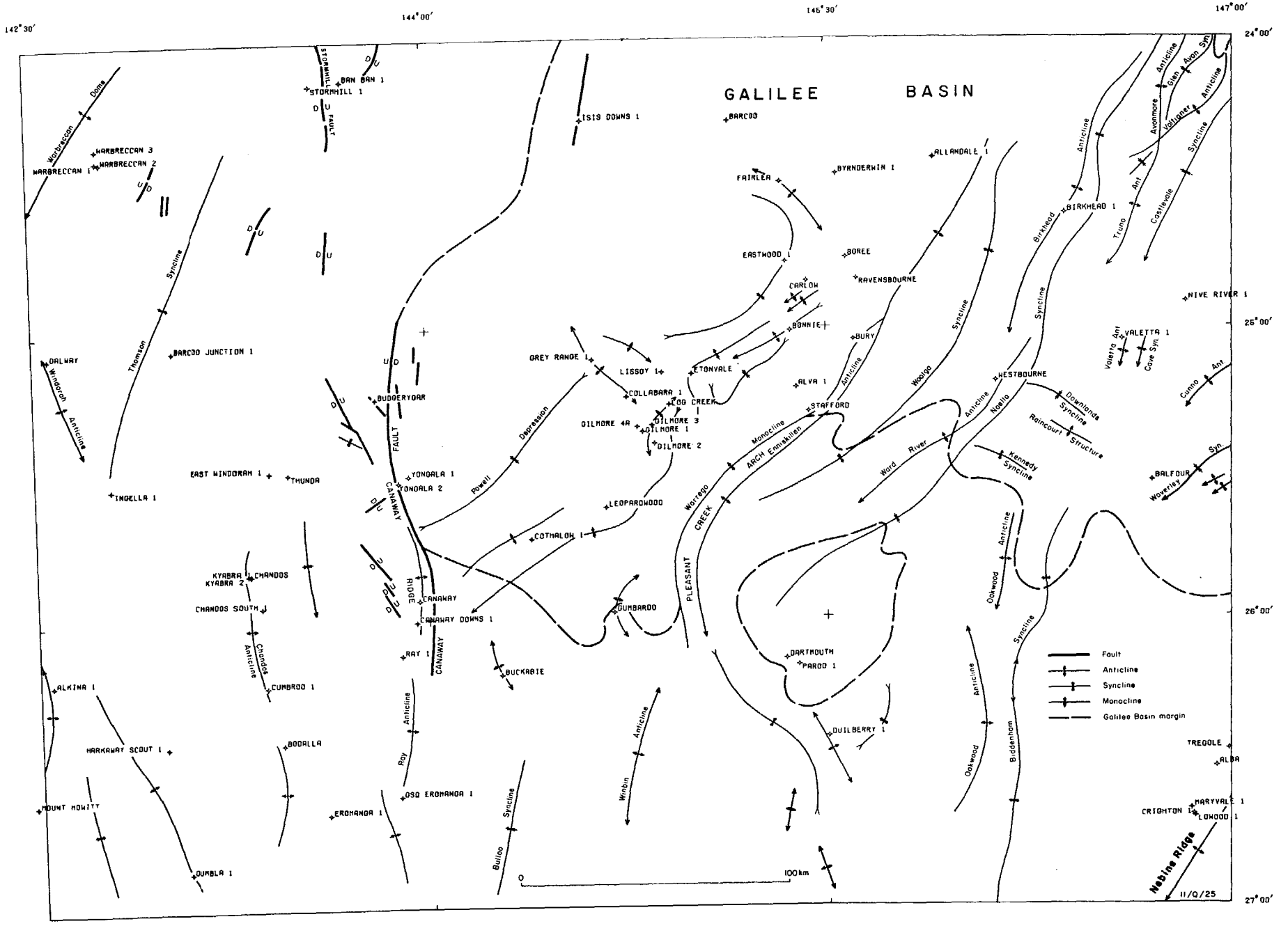


Fig. 3. **Regional structure**

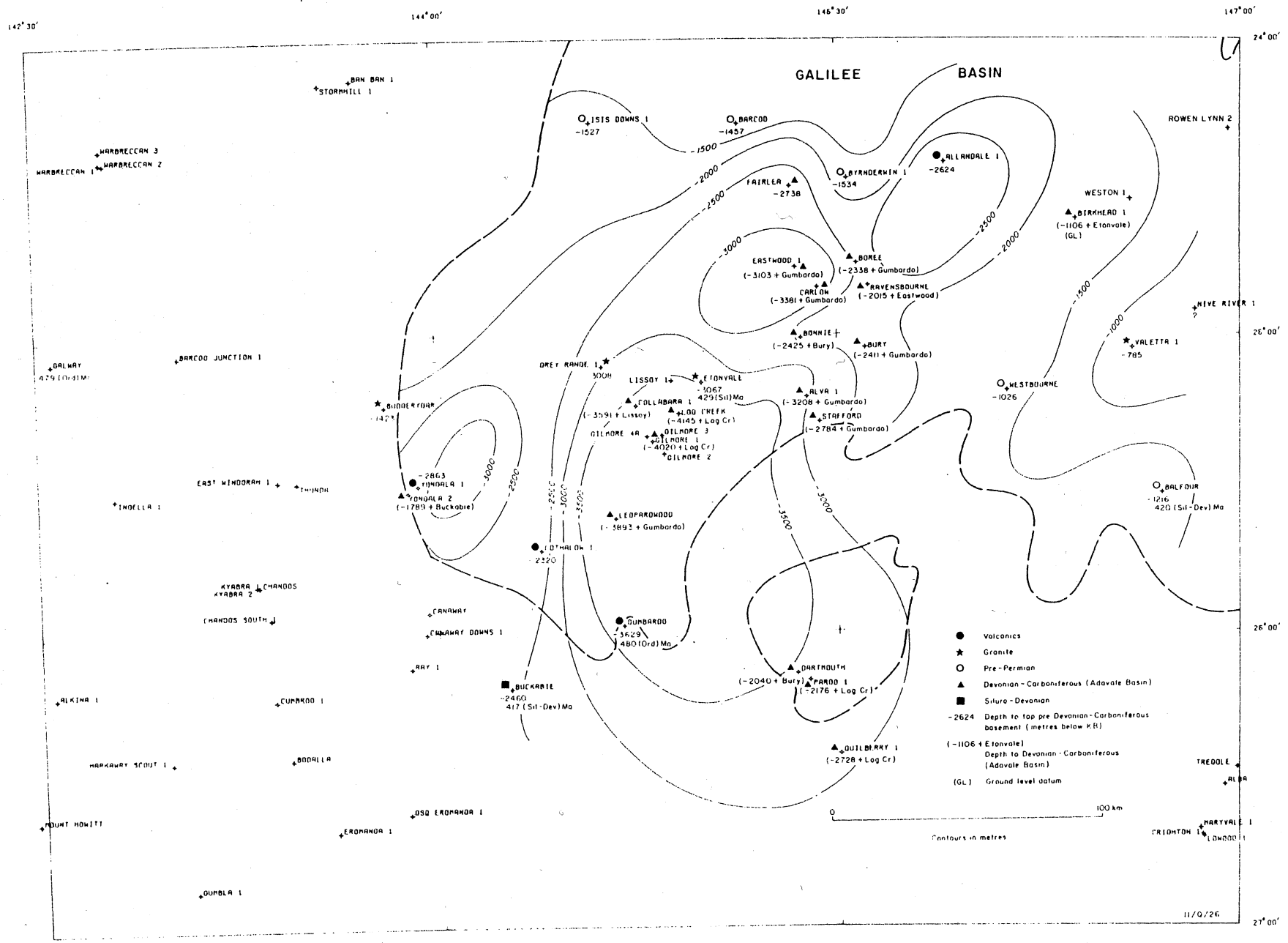


Fig. 4. Depth to Pre-Devonian basement

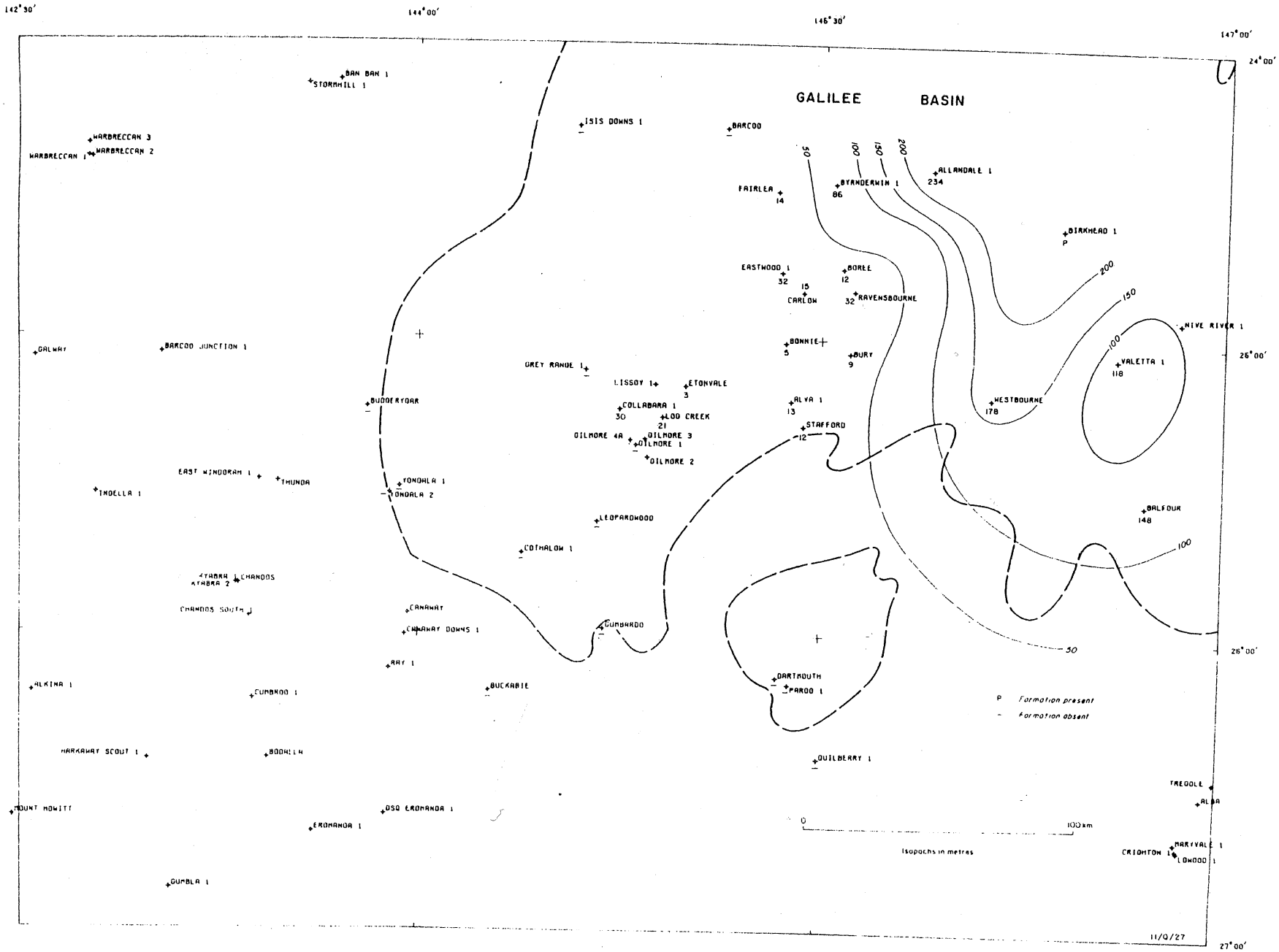


Fig. 5. Isopachs - Moolayember Formation

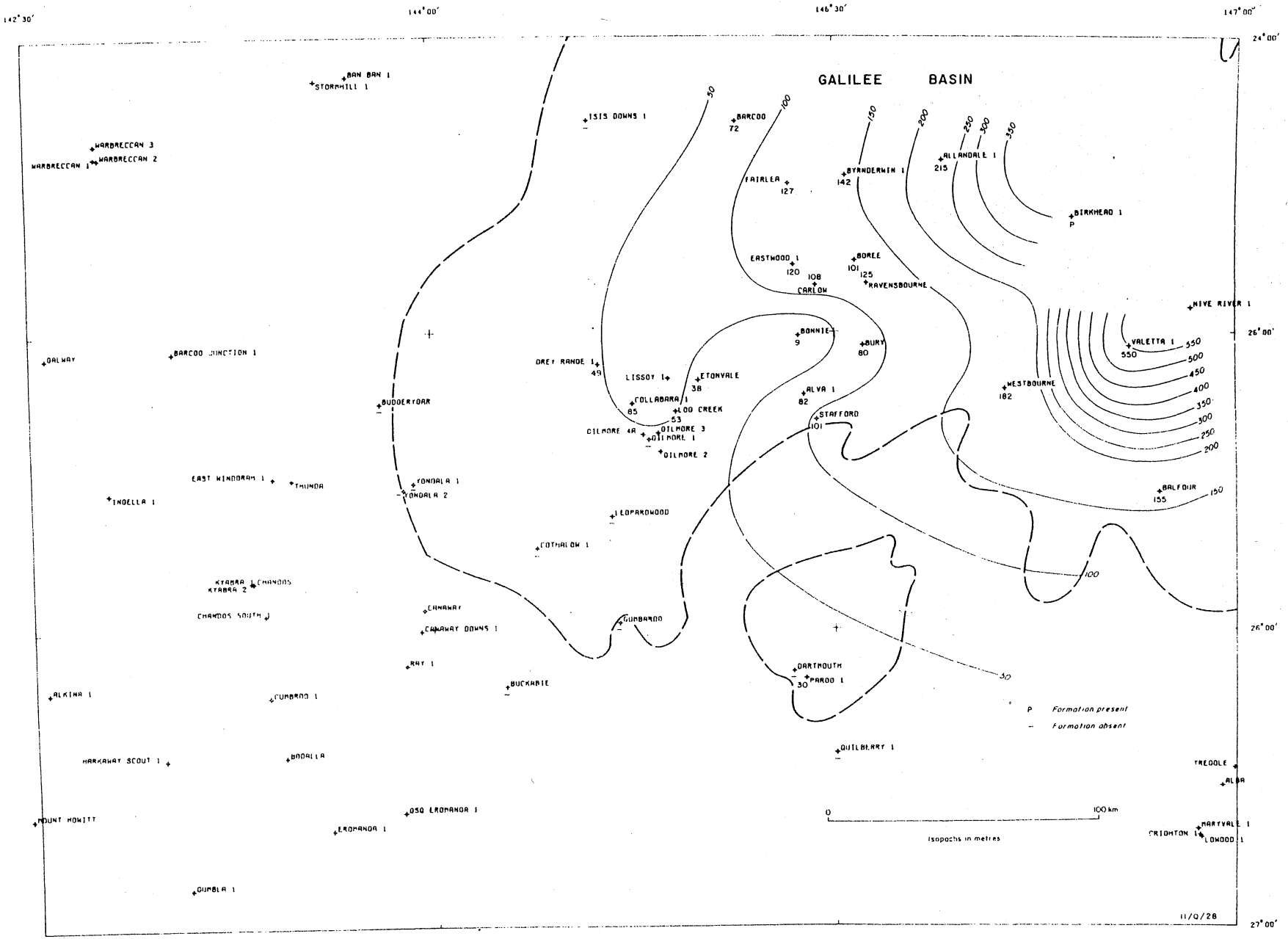


Fig. 6. Isopachs - Clematis Sandstone

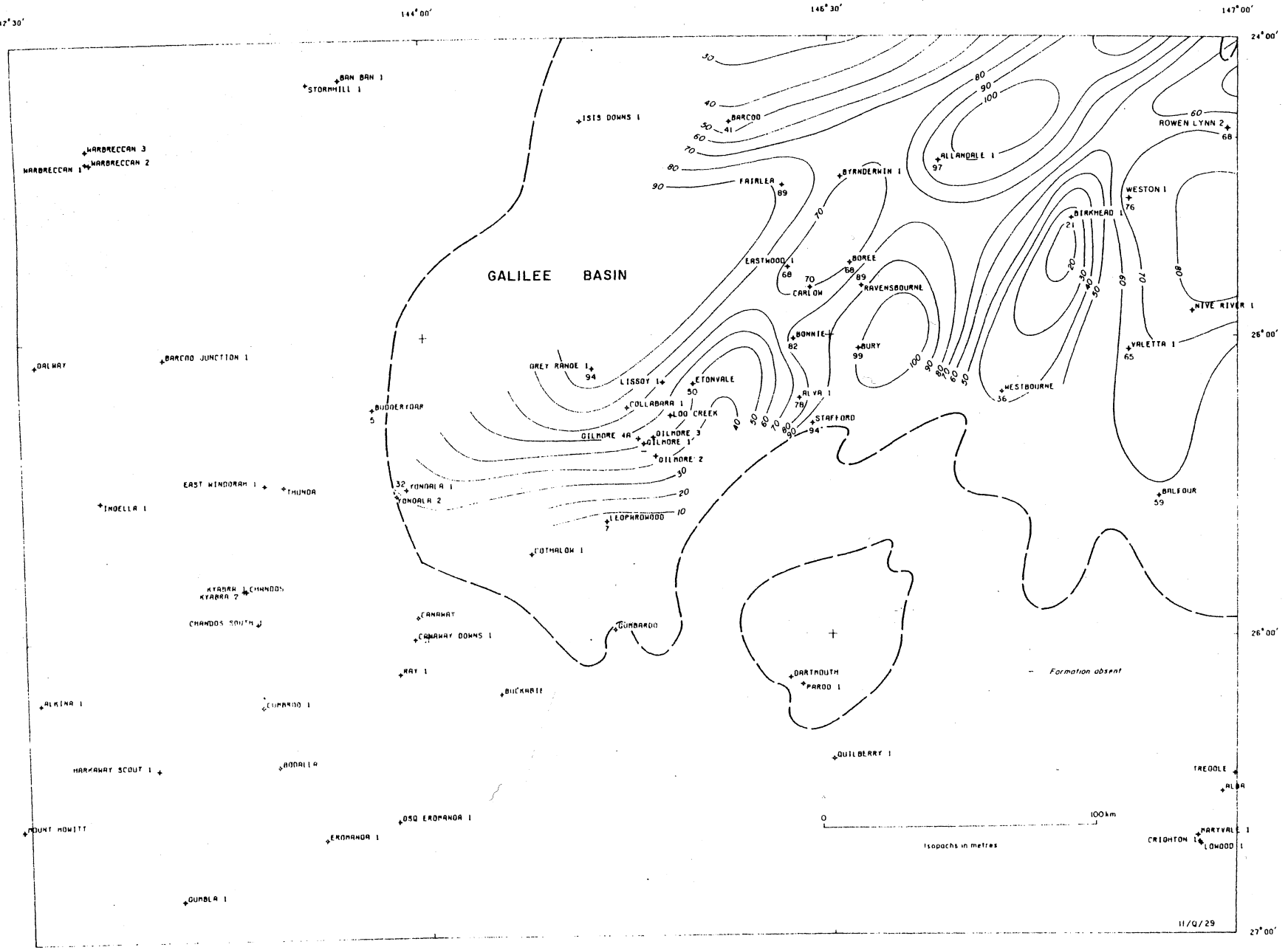


Fig. 7. **Isopachs - Bandanna Formation & equivalent**

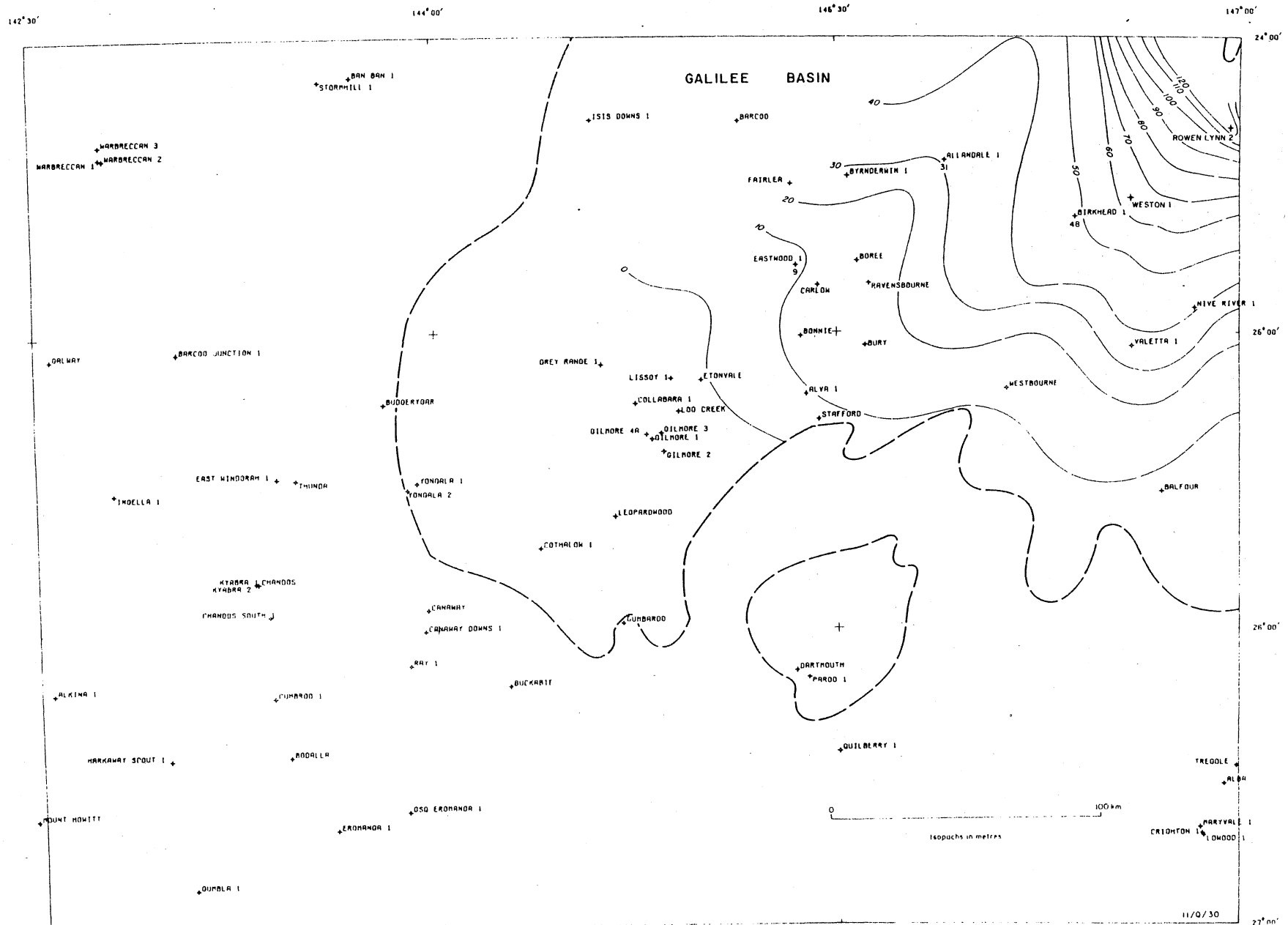


Fig. 8. Isopachs - Colinlea Sandstone

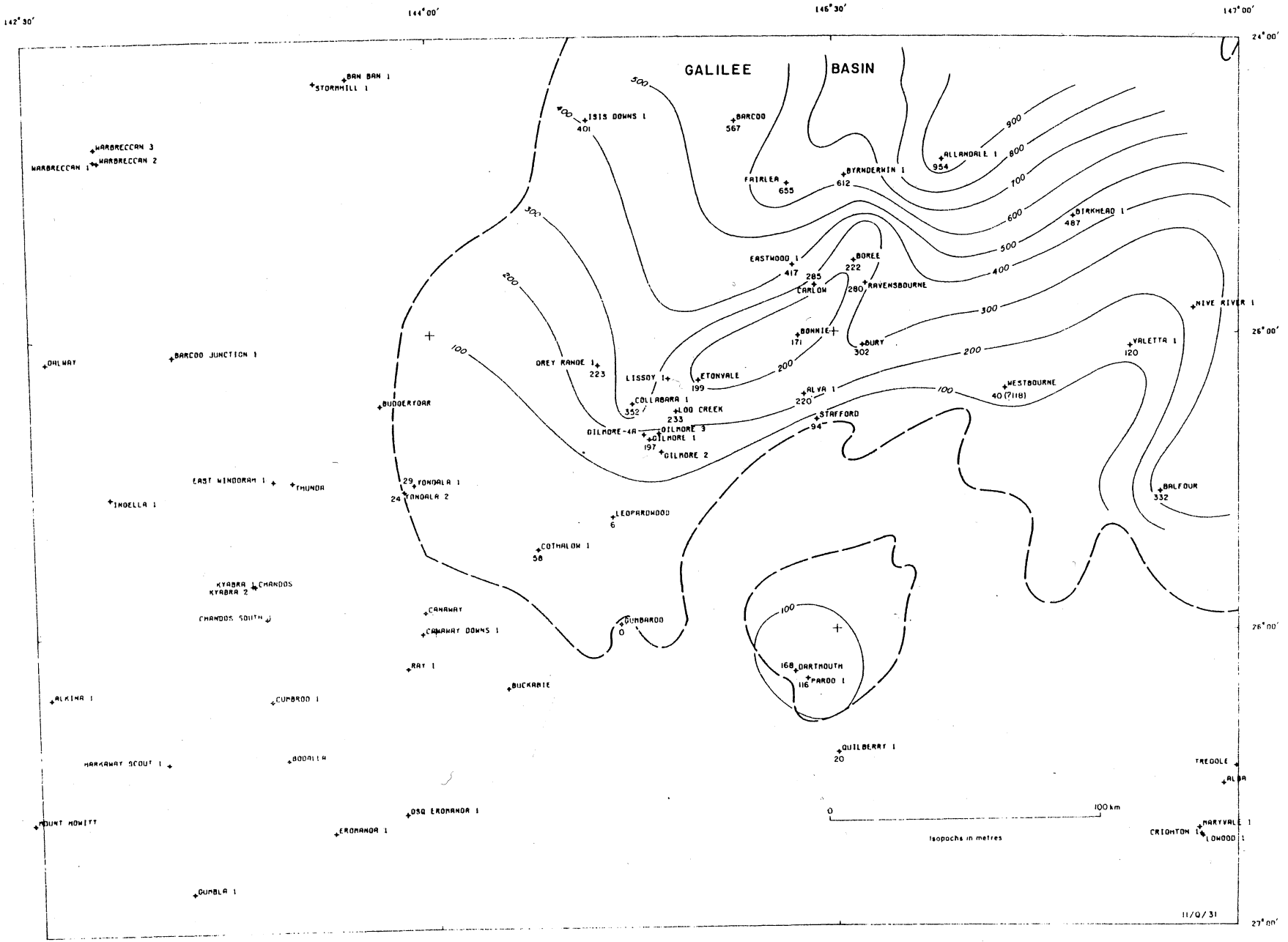


Fig. 9. **Isopachs - Permo-Carboniferous**

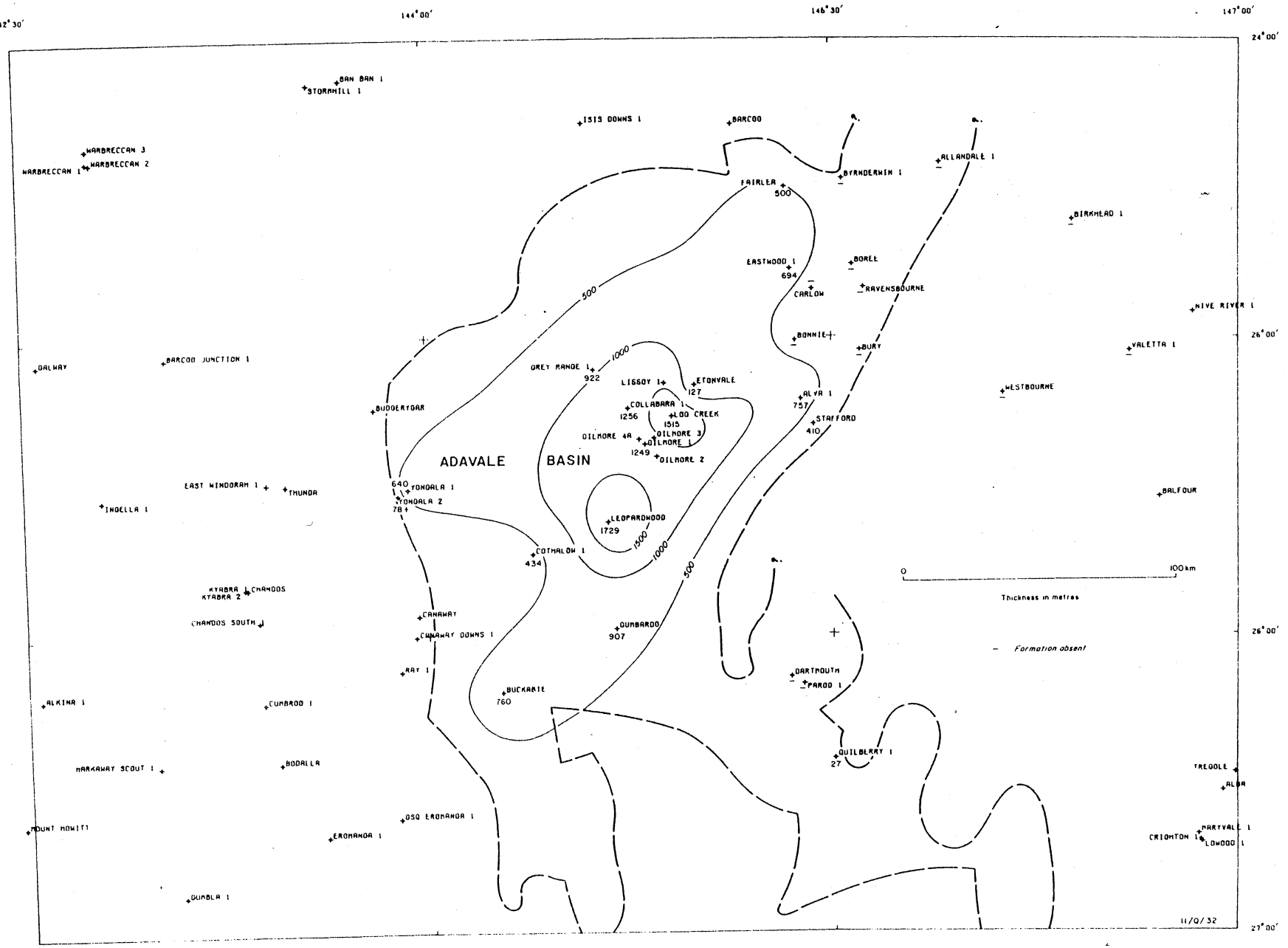


Fig.10. Thickness - Buckabie Formation

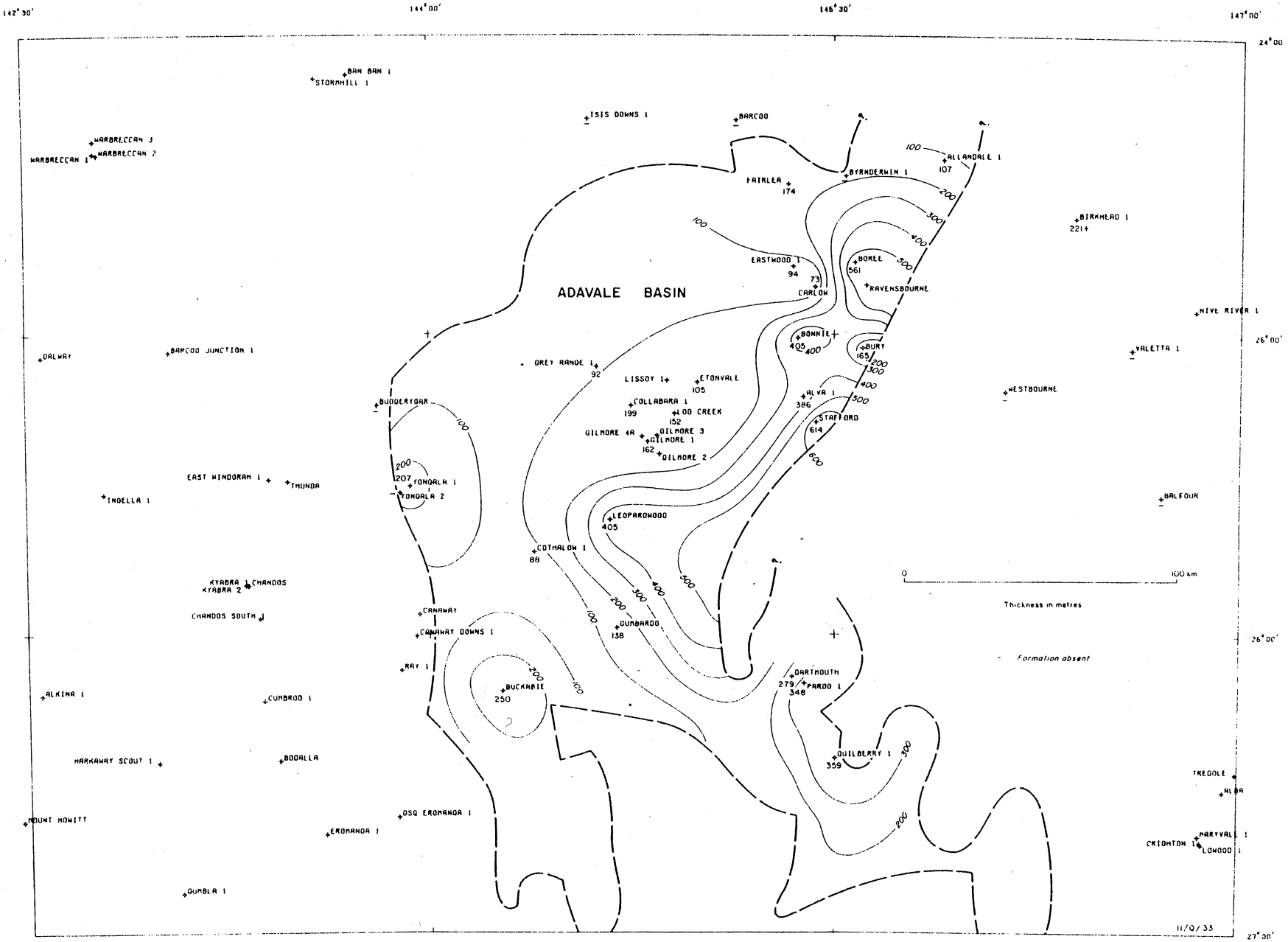


Fig.11. **Thickness - Etonvale Formation - Shale/siltstone member**

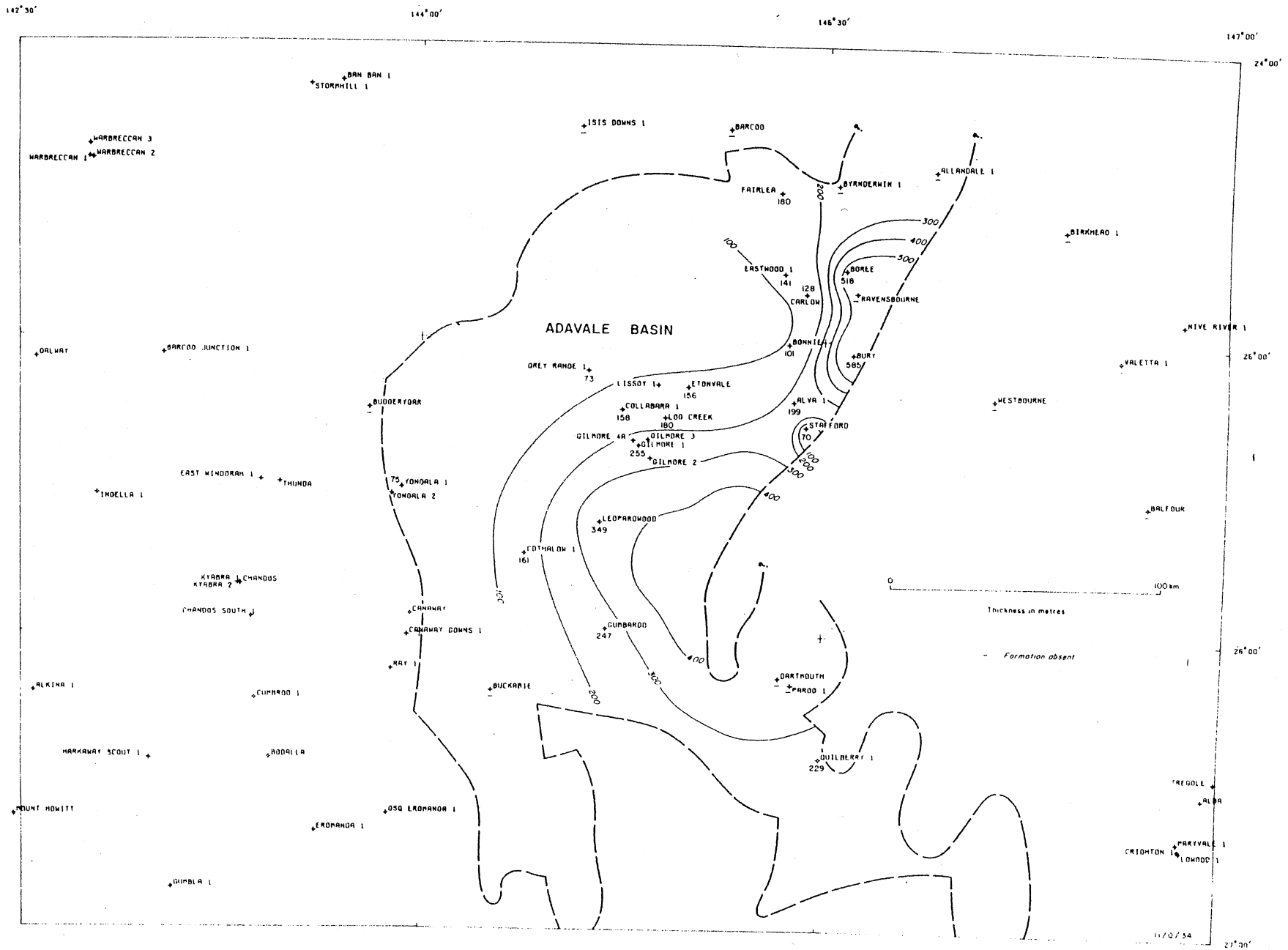


Fig. 12. **Thickness - Etonvale Formation - Sandstone/Boree Salt member**

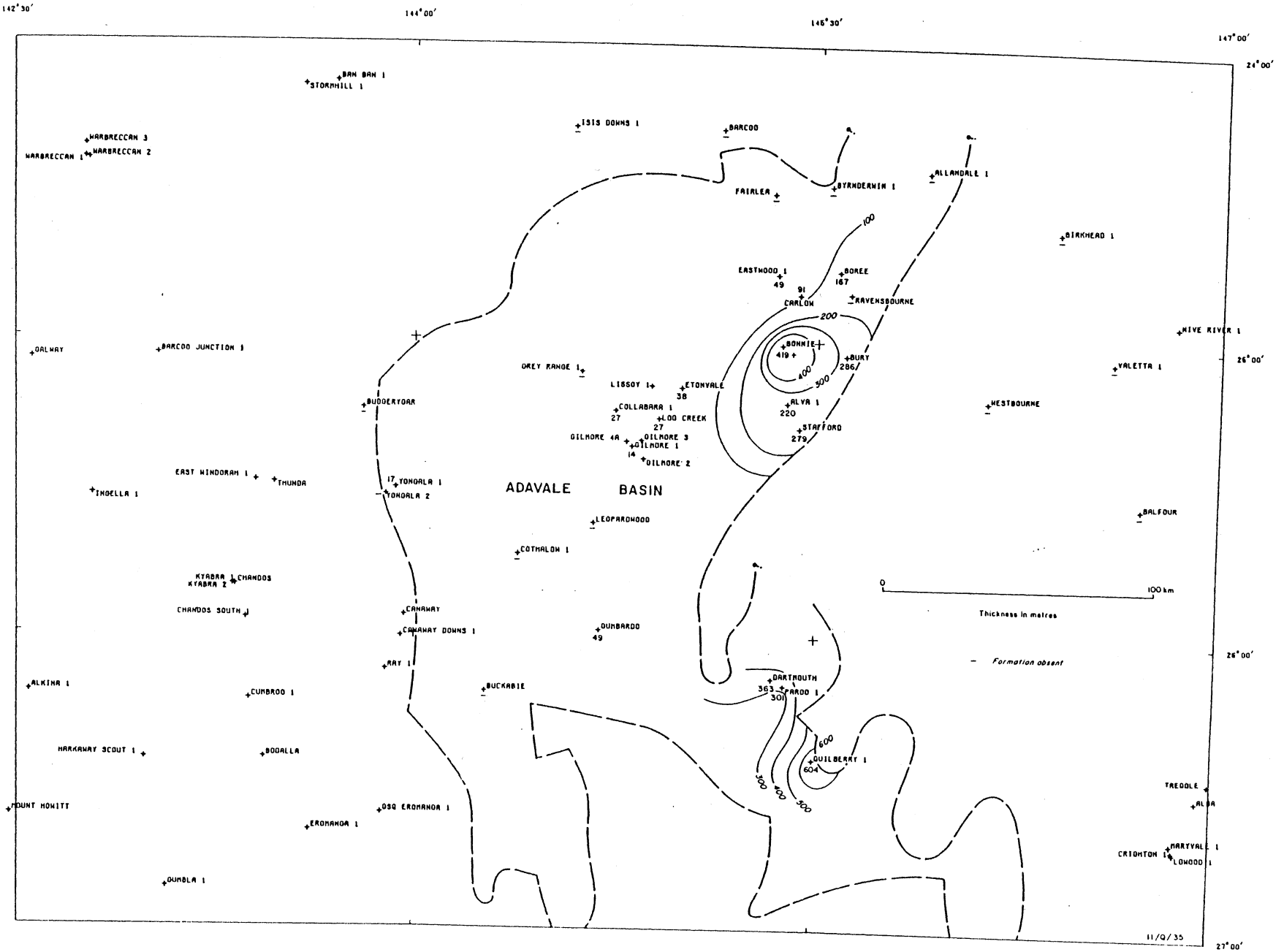


Fig. 13. Thickness - Bury Limestone - Coolladdi Dolomite

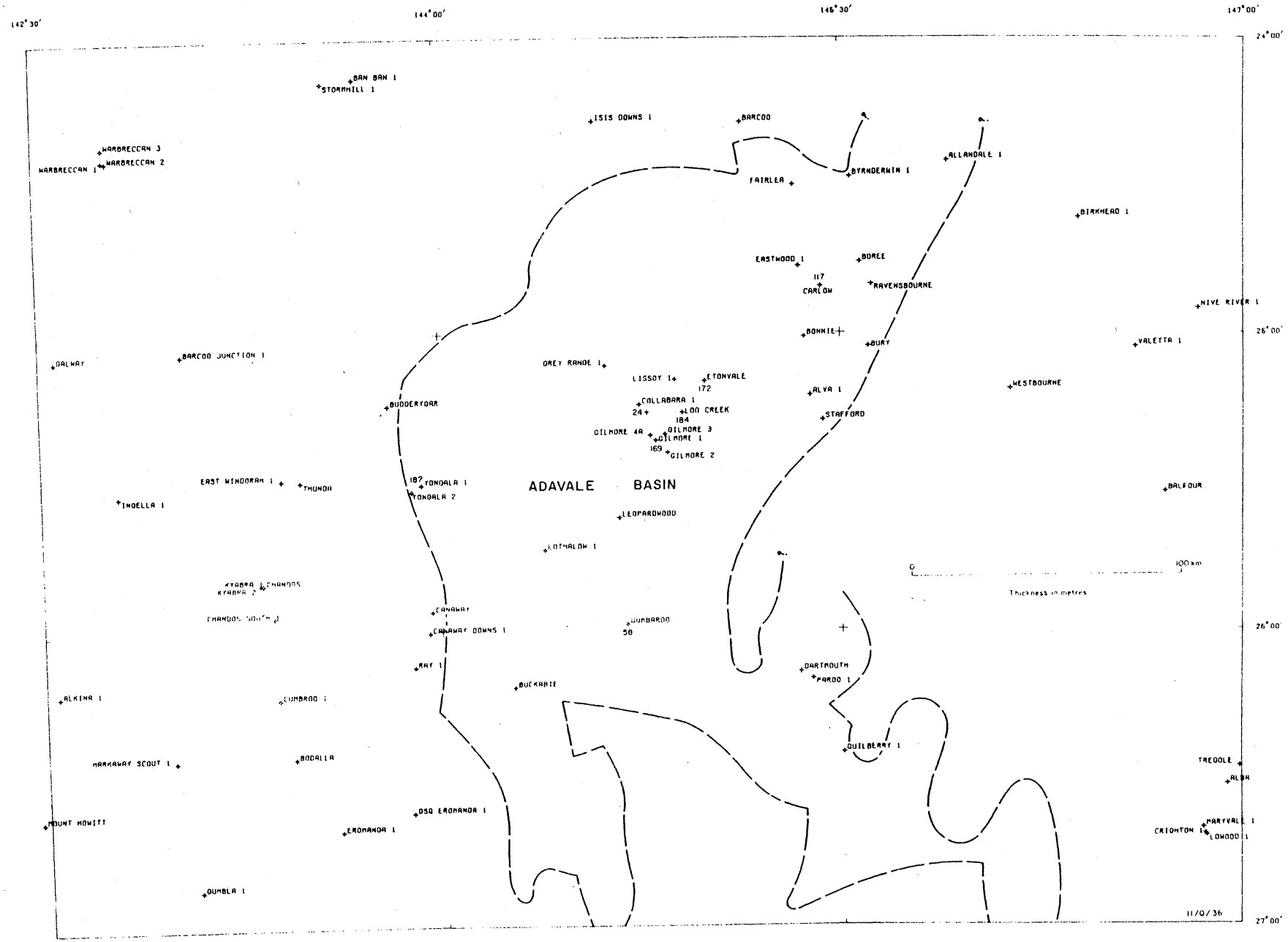


Fig. 14. **Thickness - Bury Limestone - Lissoy Sandstone**

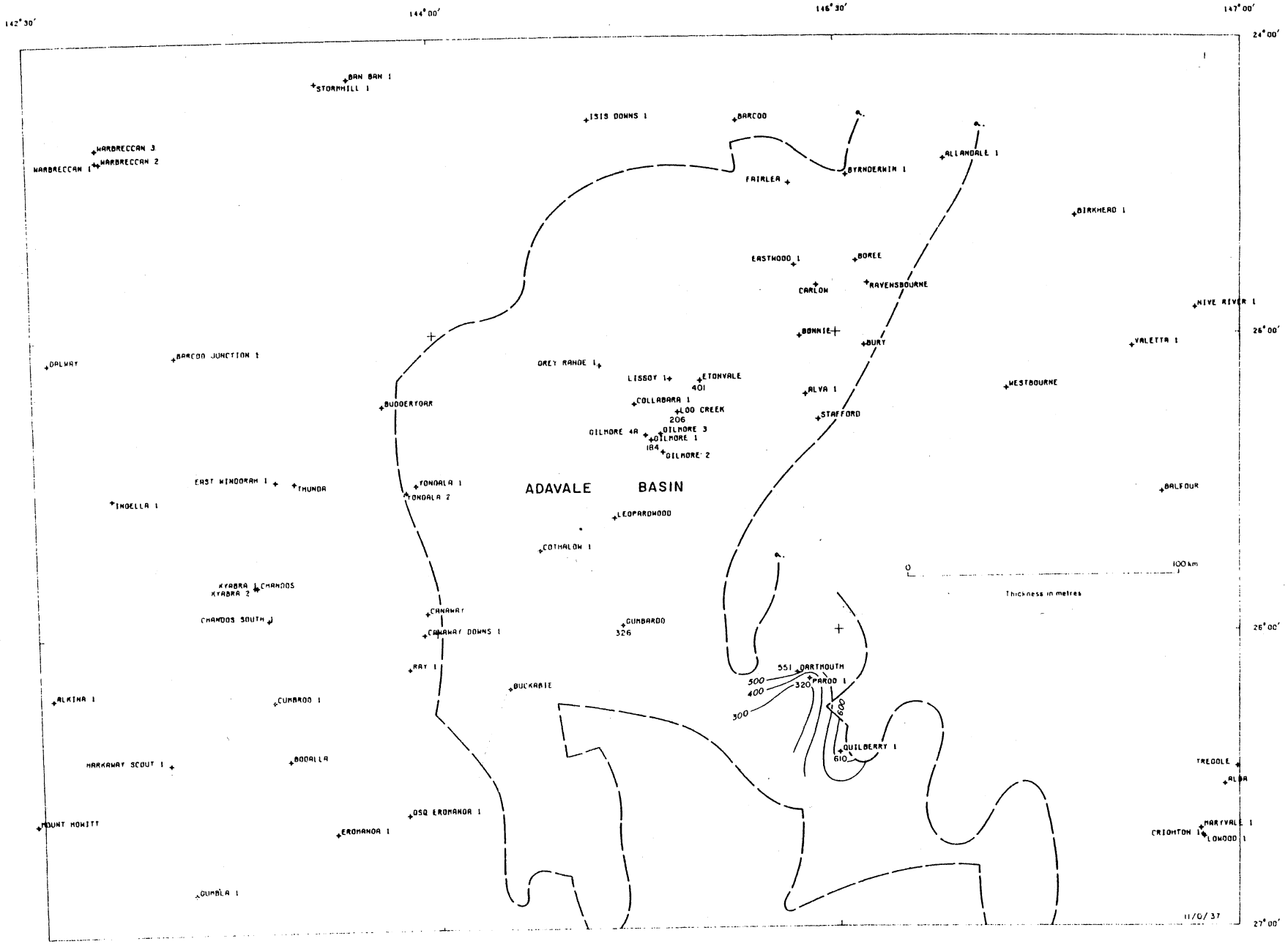


Fig. 15. **Thickness - Log Creek Formation - deltaic facies (upper)**

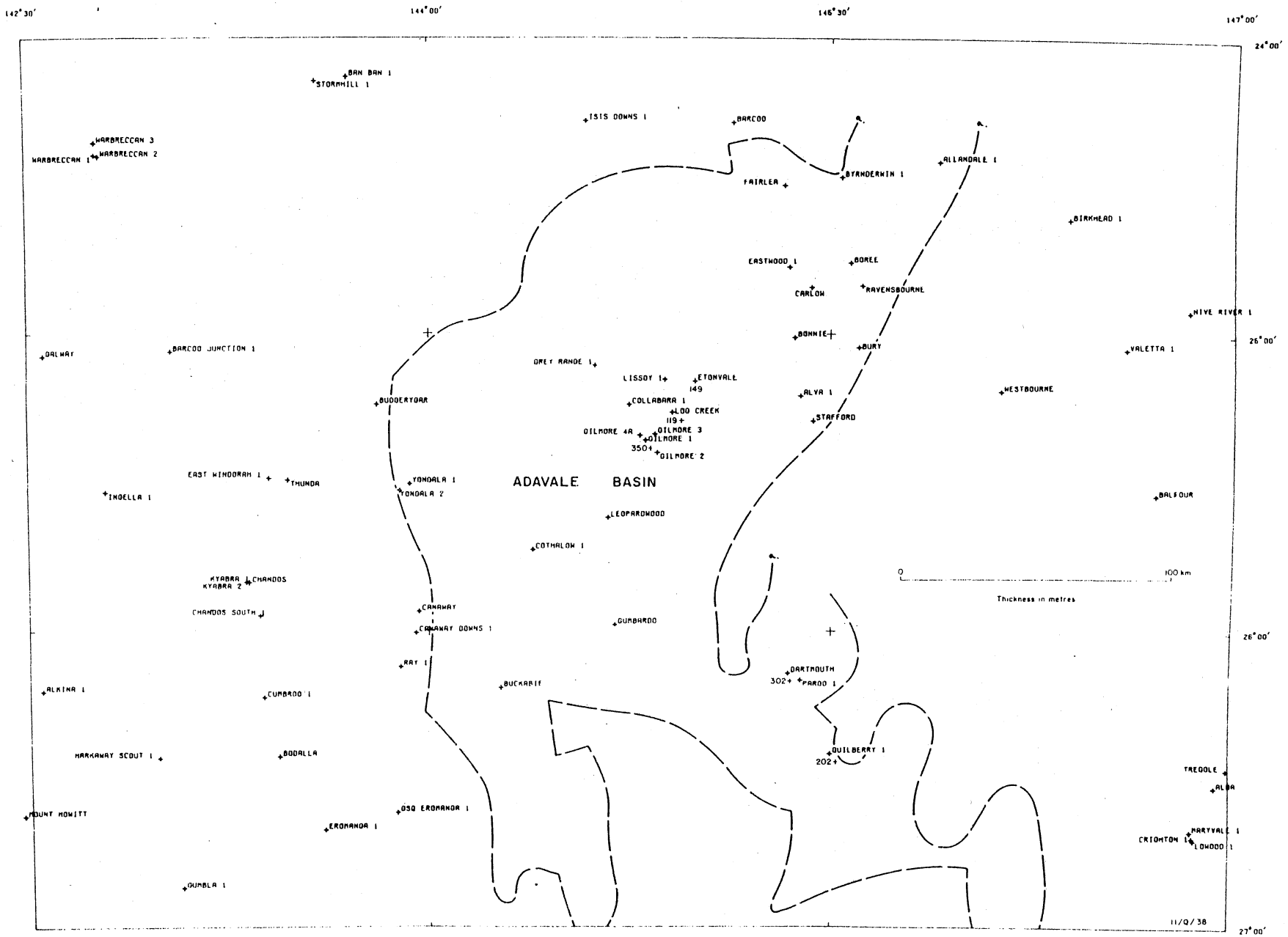


Fig. 16. **Thickness - Log Creek Formation - marine facies (lower)**

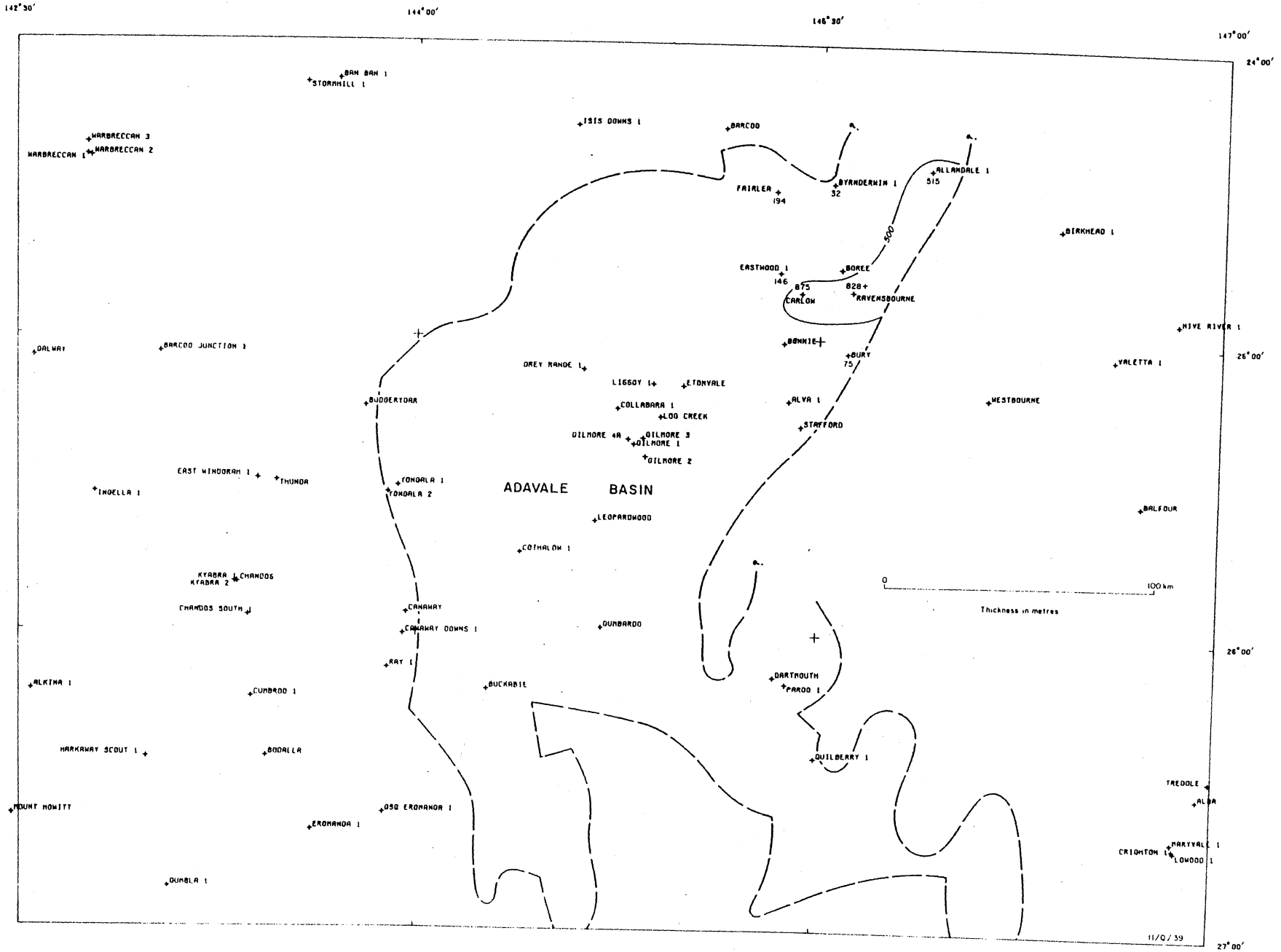


Fig. 17. **Thickness - Eastwood Beds**

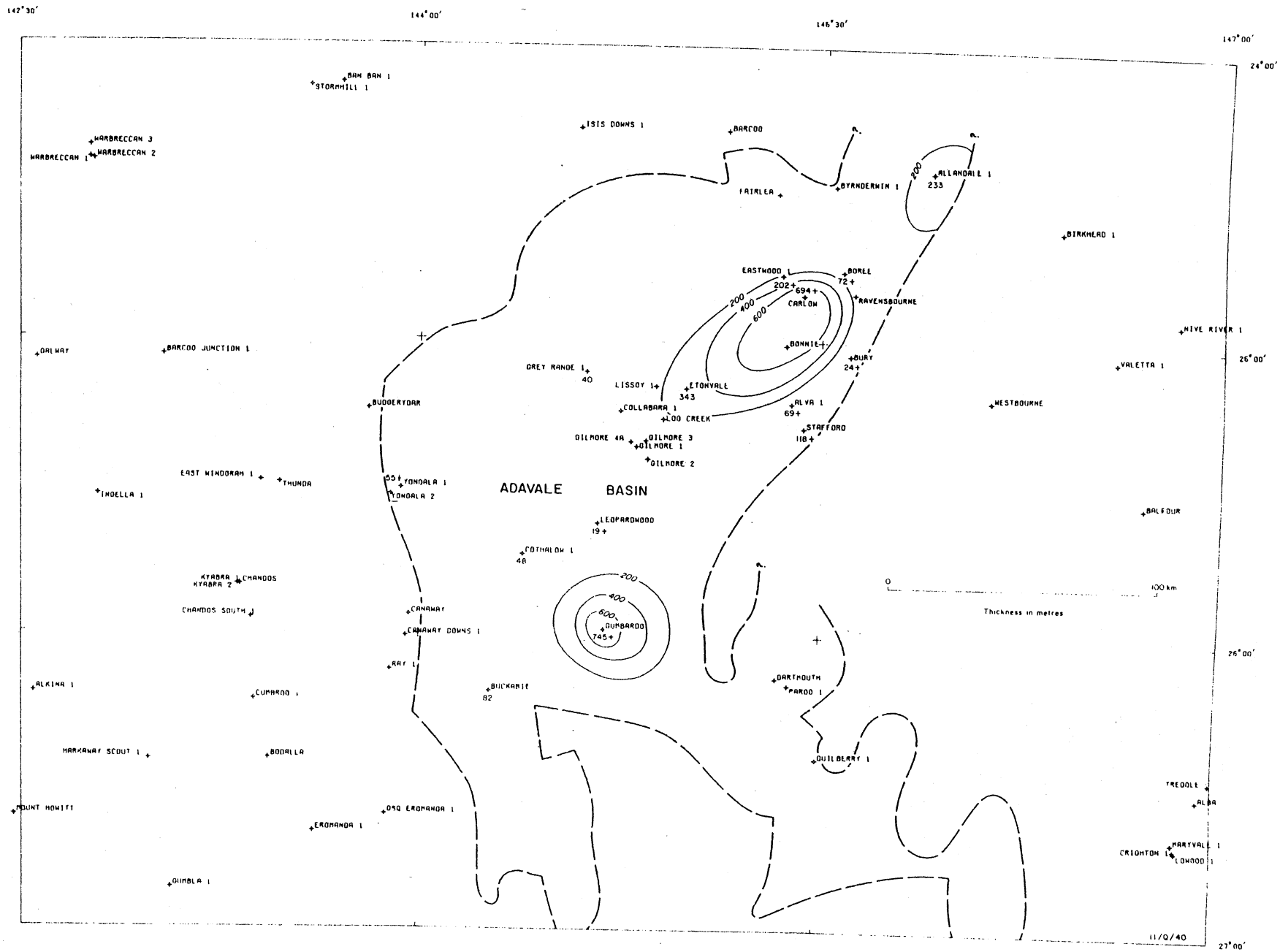


Fig. 18. **Thickness - Gumbardo Formation**

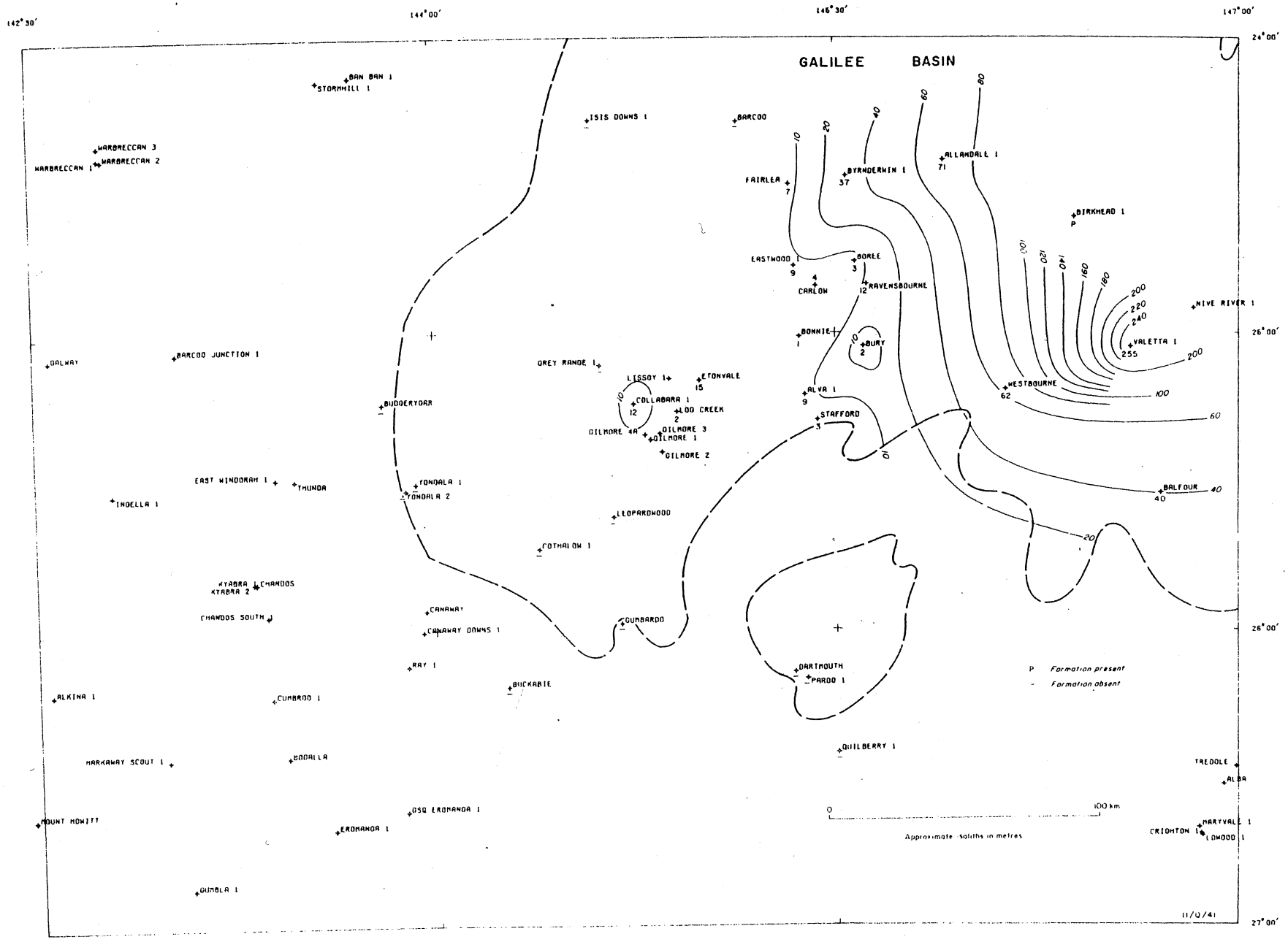


Fig.19. Sand isoliths - Moolayember Formation

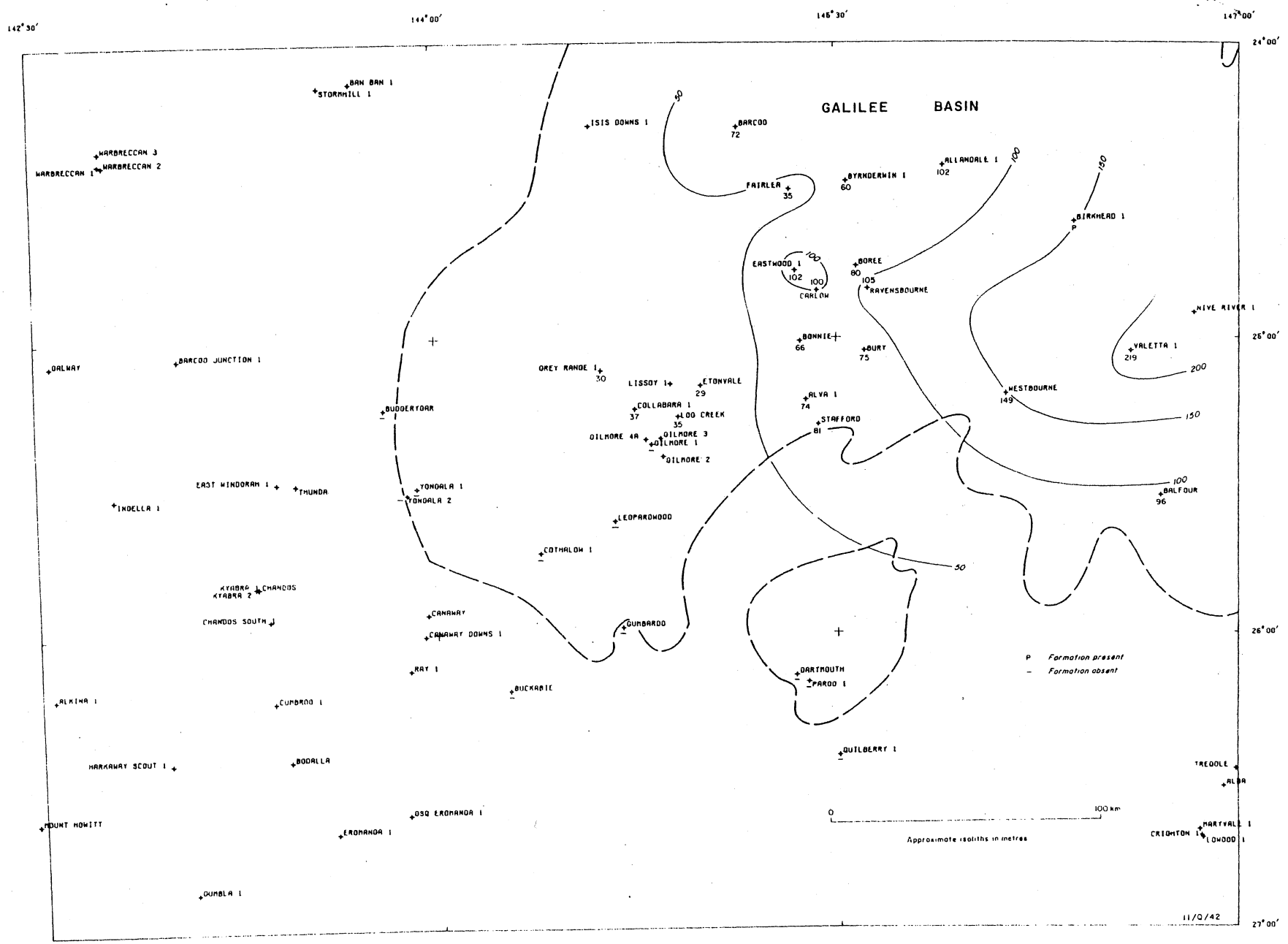


Fig. 20. Sand isoliths - Clematis Sandstone

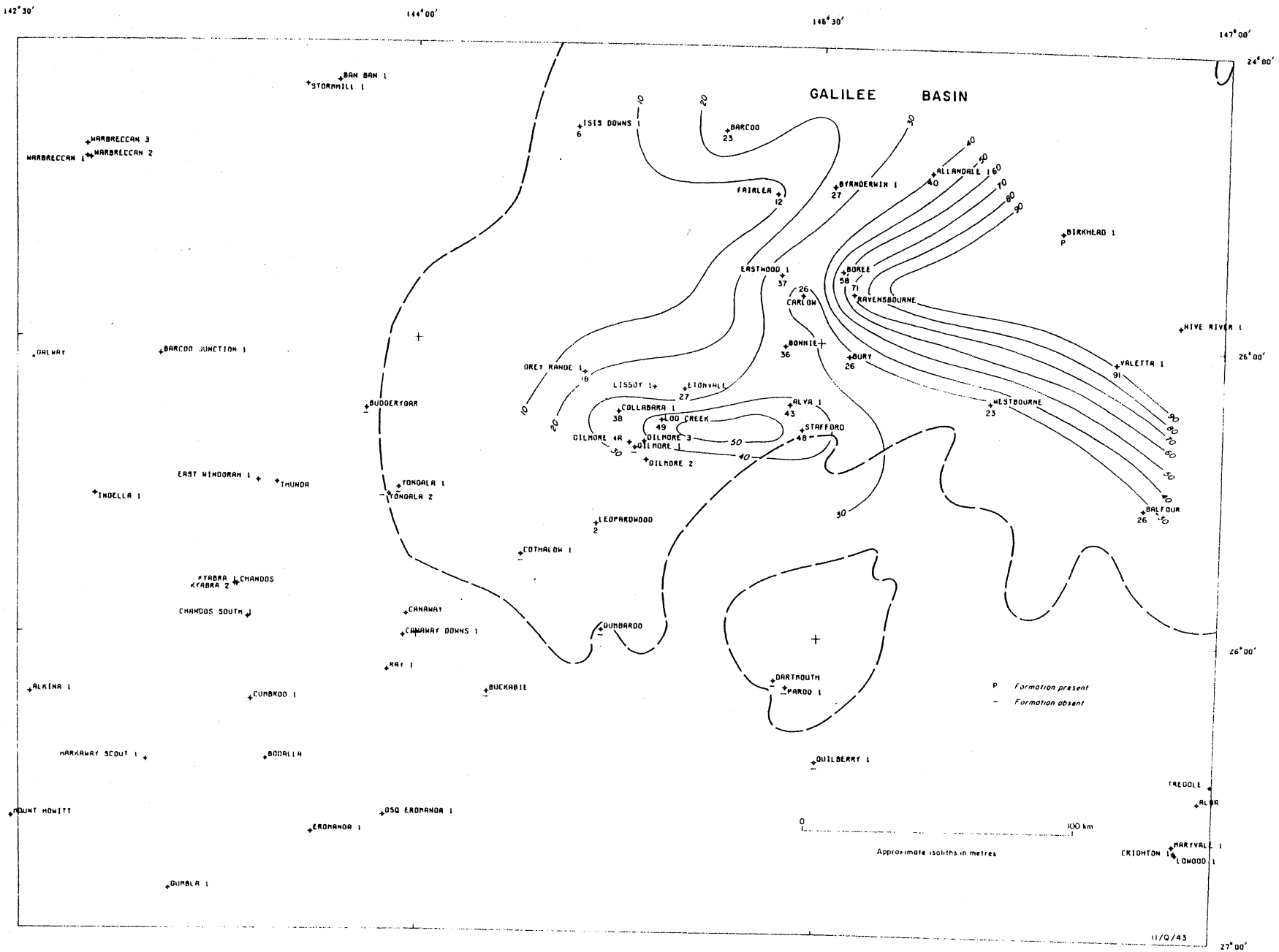


Fig. 21. Sand isoliths - Bandanna Formation & equivalent

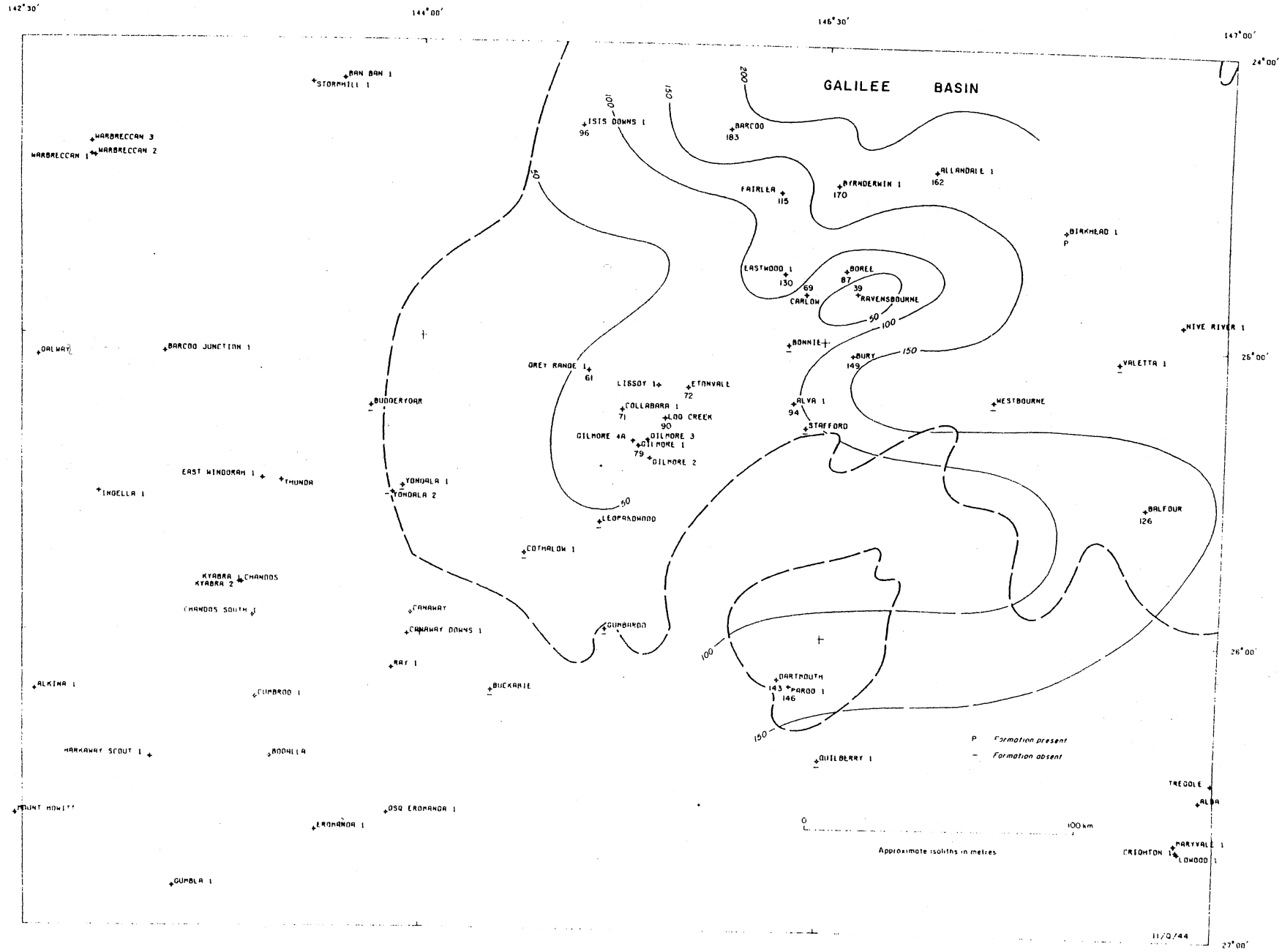


Fig. 22. Sand isoliths - Joe Joe Group

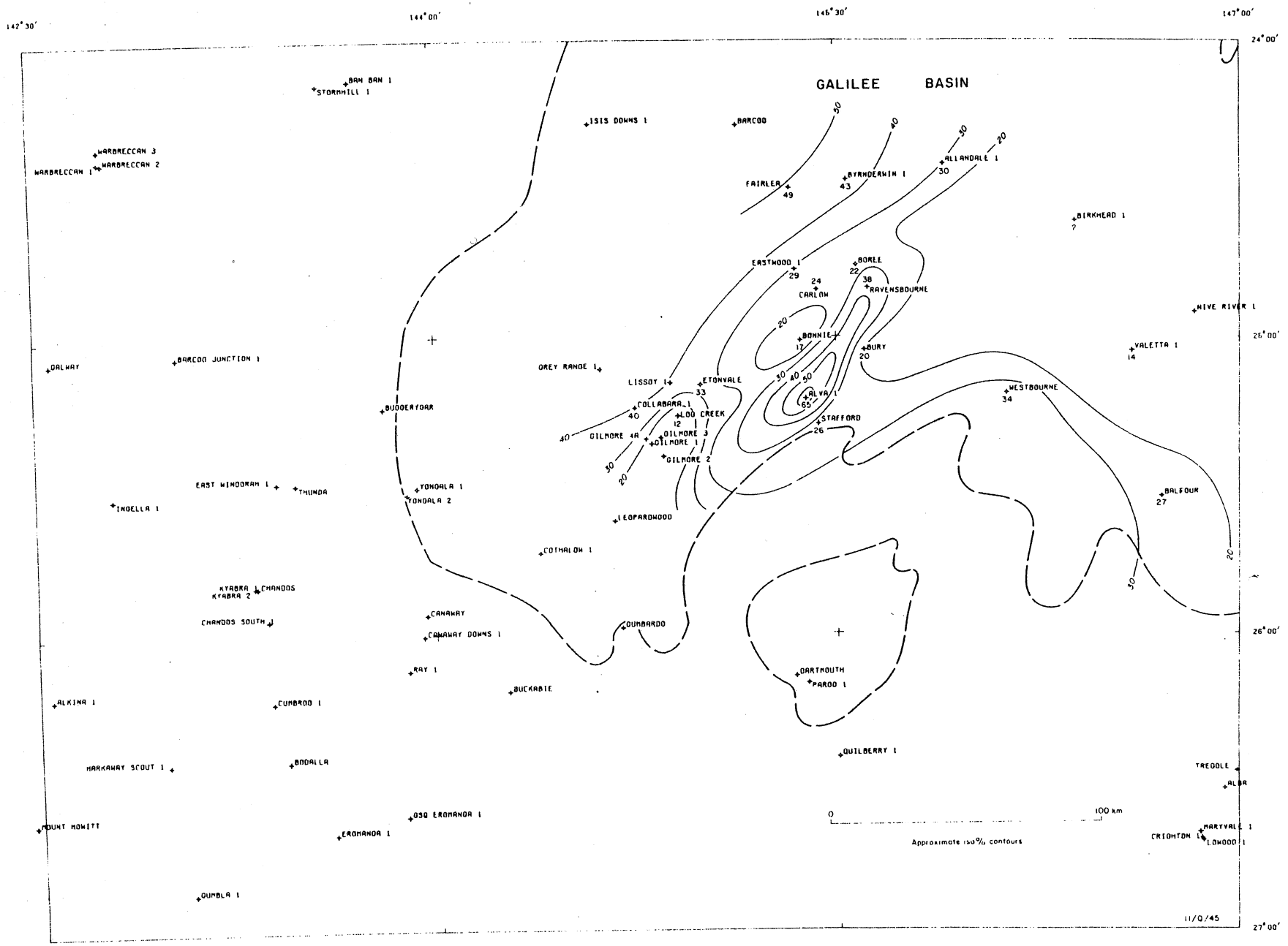


Fig. 23. Sand thickness - Moolayember Formation

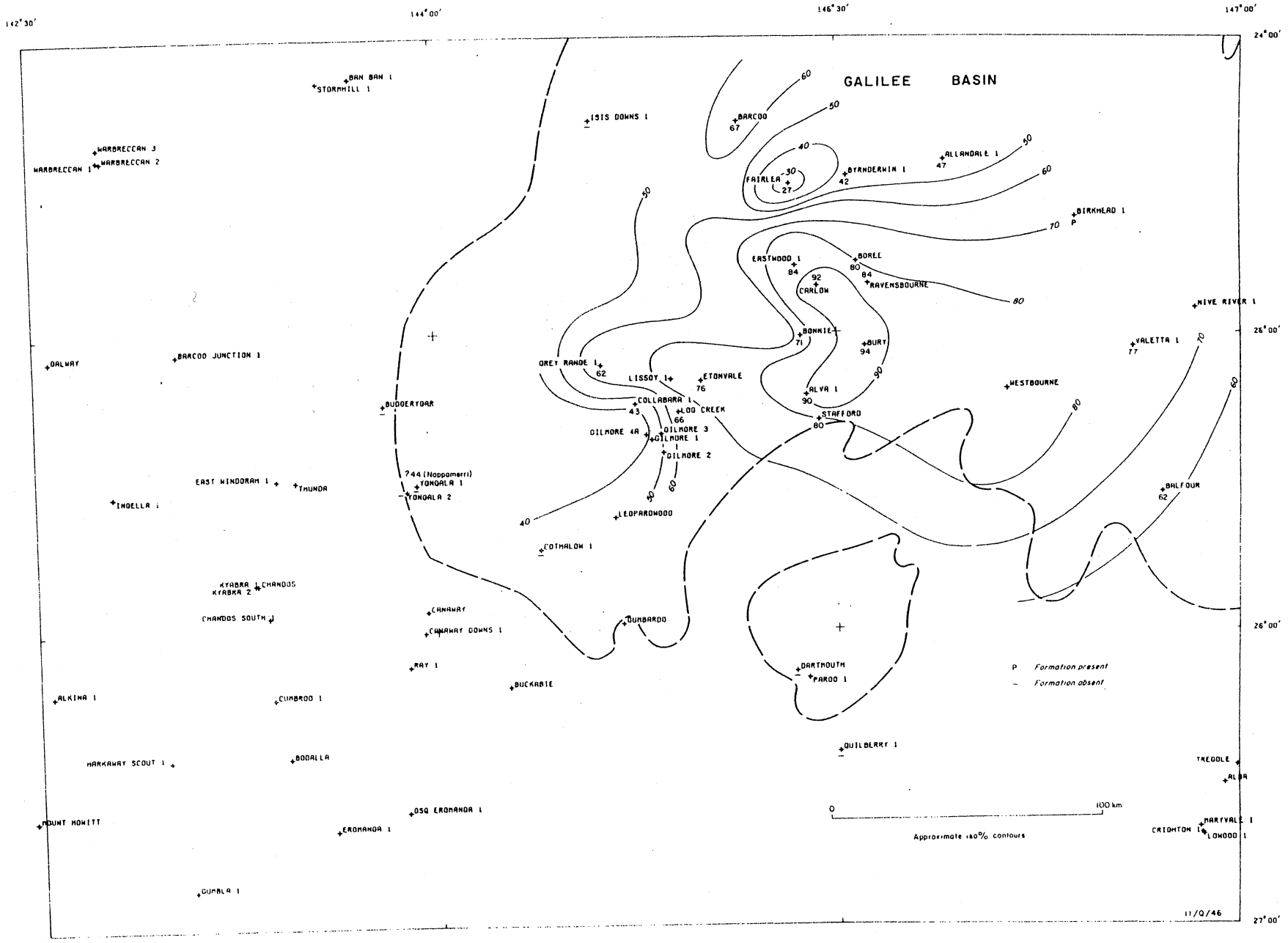


Fig. 24. **Sand thickness - Clematis Sandstone**

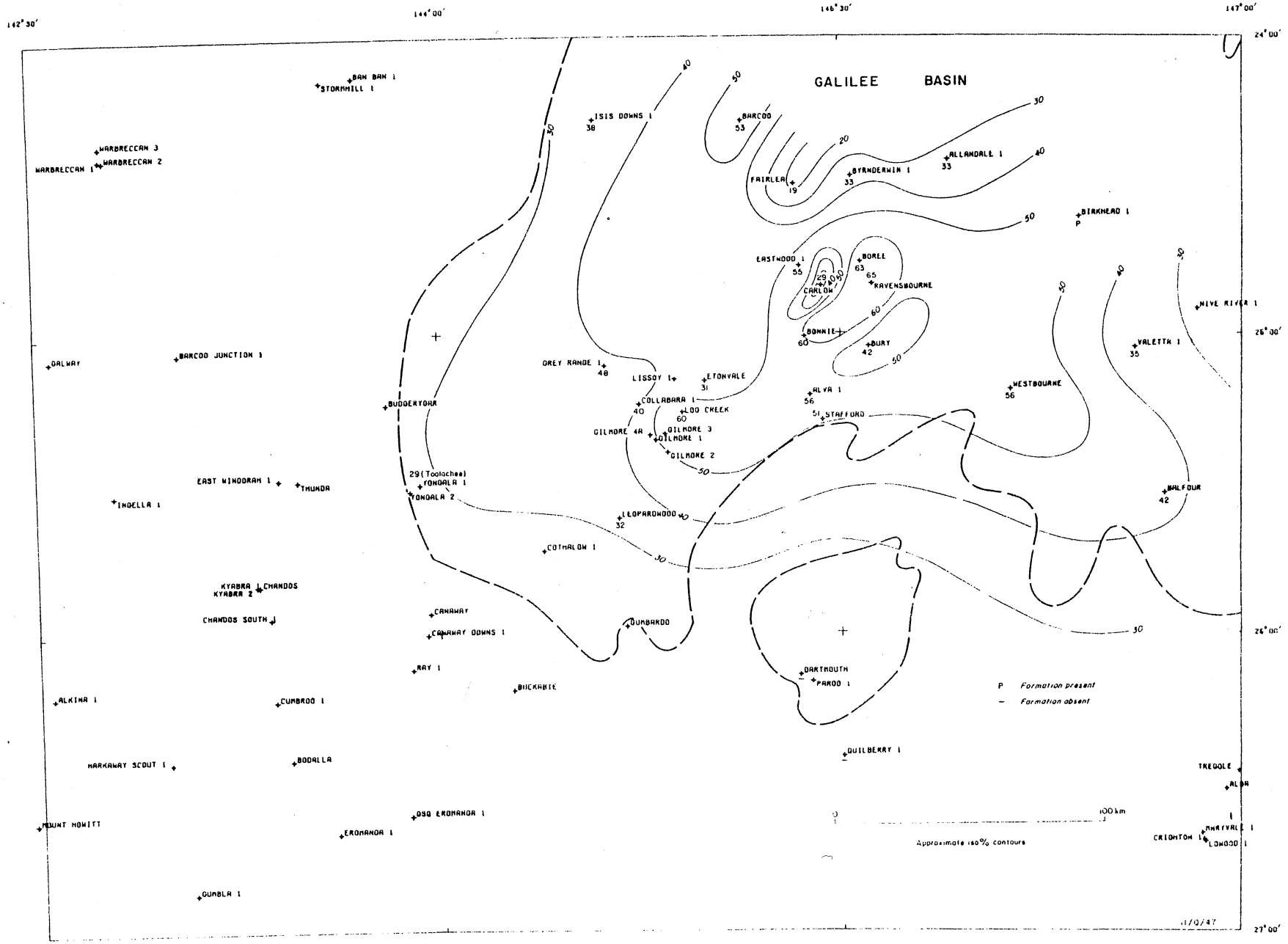


Fig. 25. Sand thickness - Bandanna Formation & equivalent

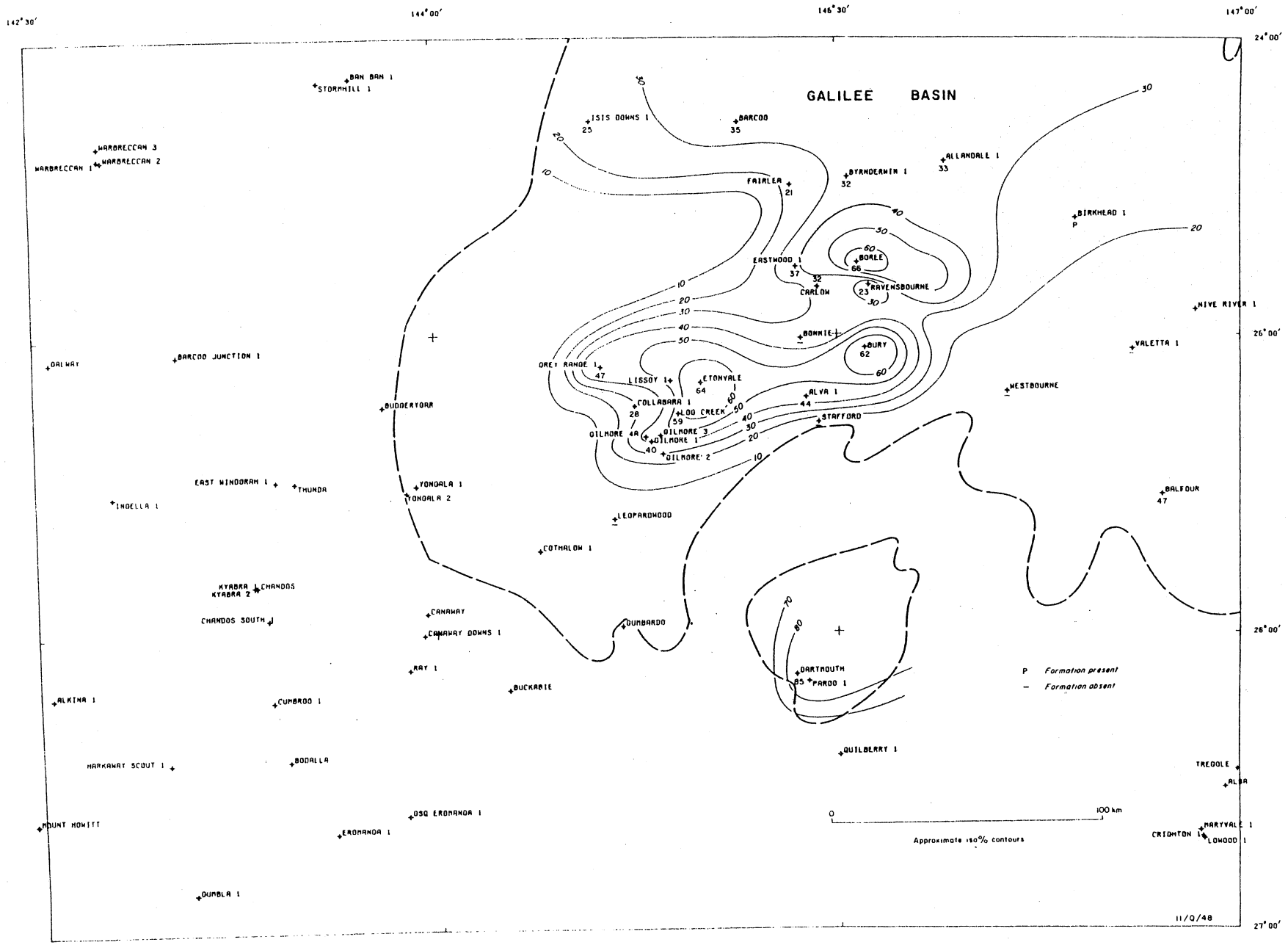


Fig. 26. Sand thickness - Joe Joe Group

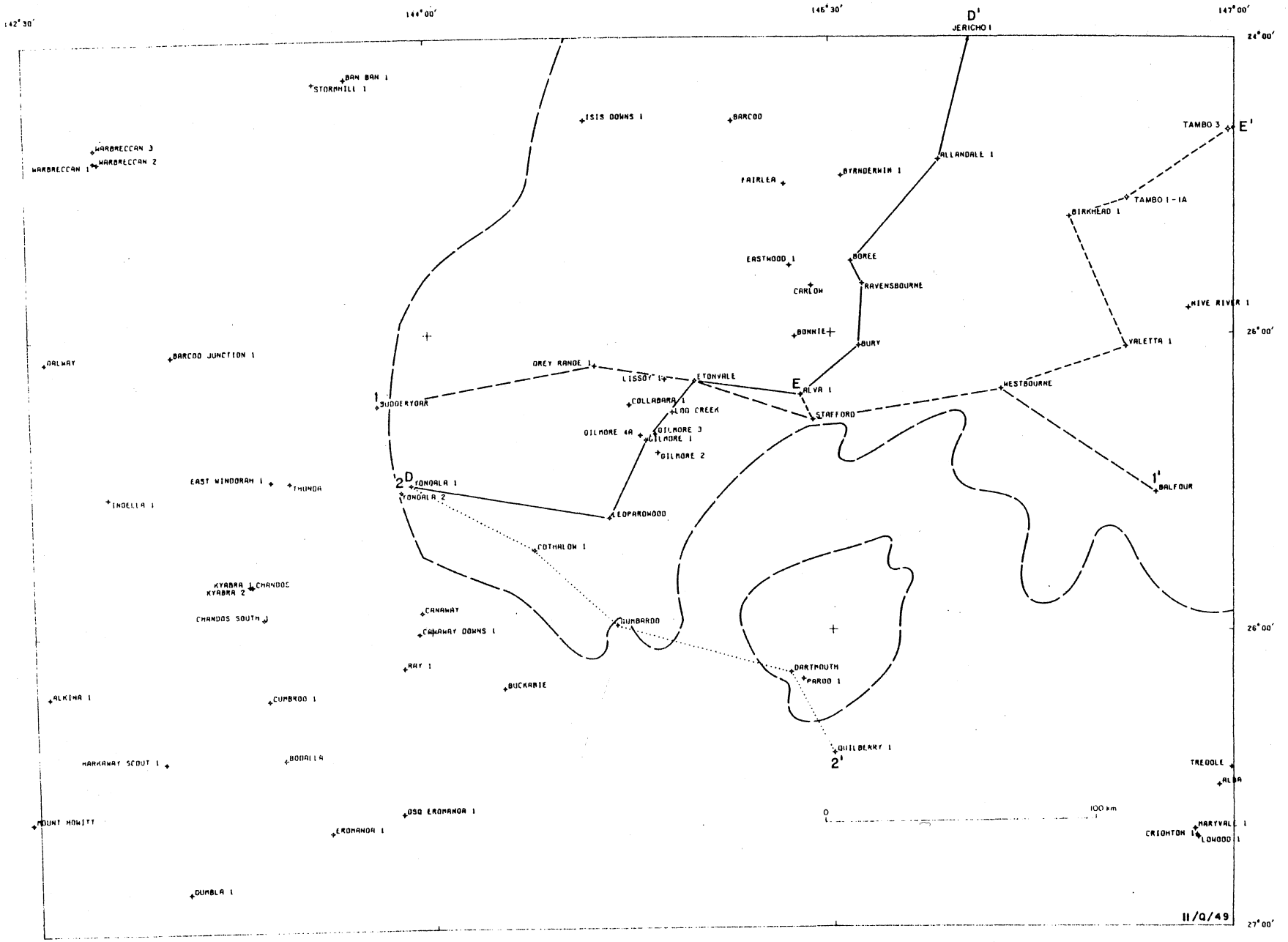
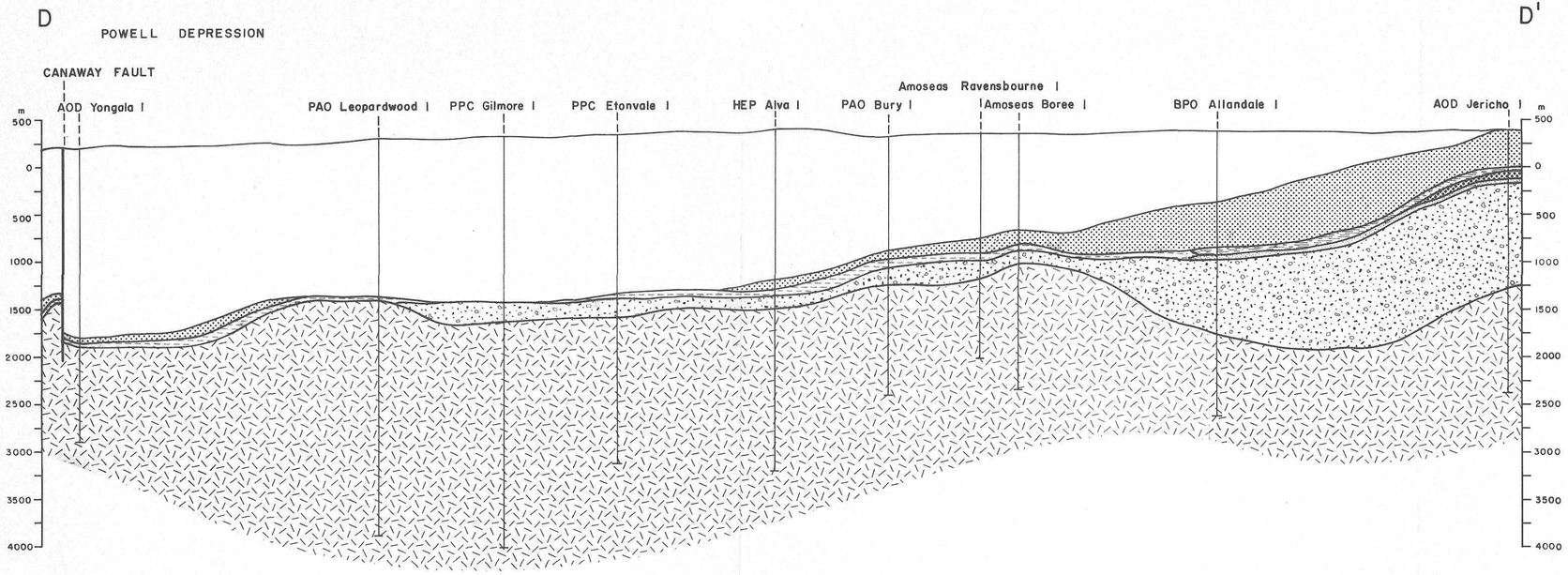
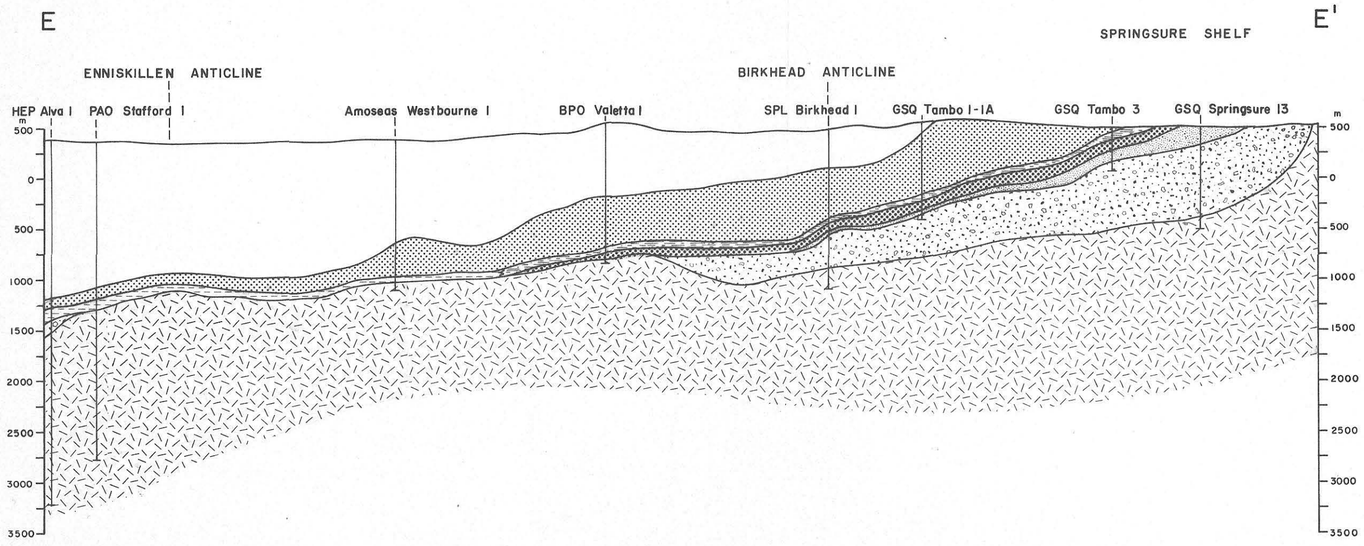


Fig.27. Location of section lines





Datum : Sea-level
Cainozoic omitted

$\frac{V}{H} = 24$

• Sections constructed from well data only

LEGEND

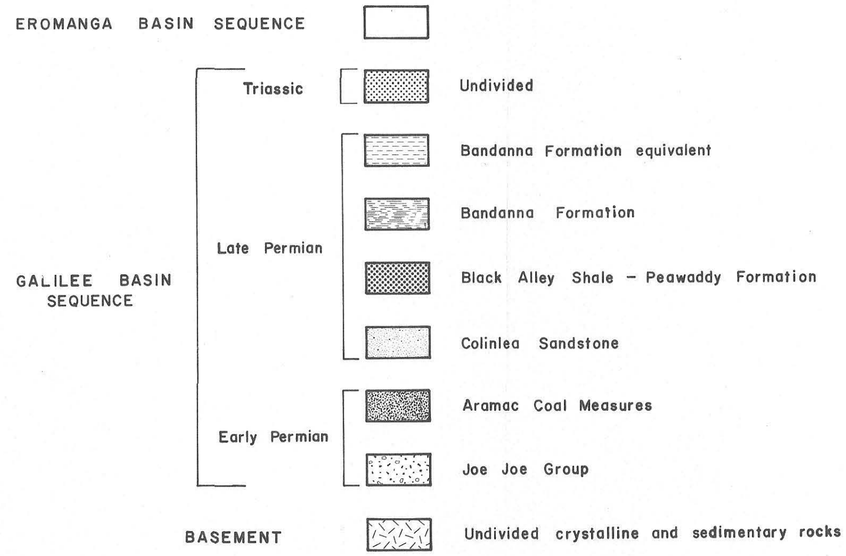


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Fig.28. Cross-sections D-D' and E-E'

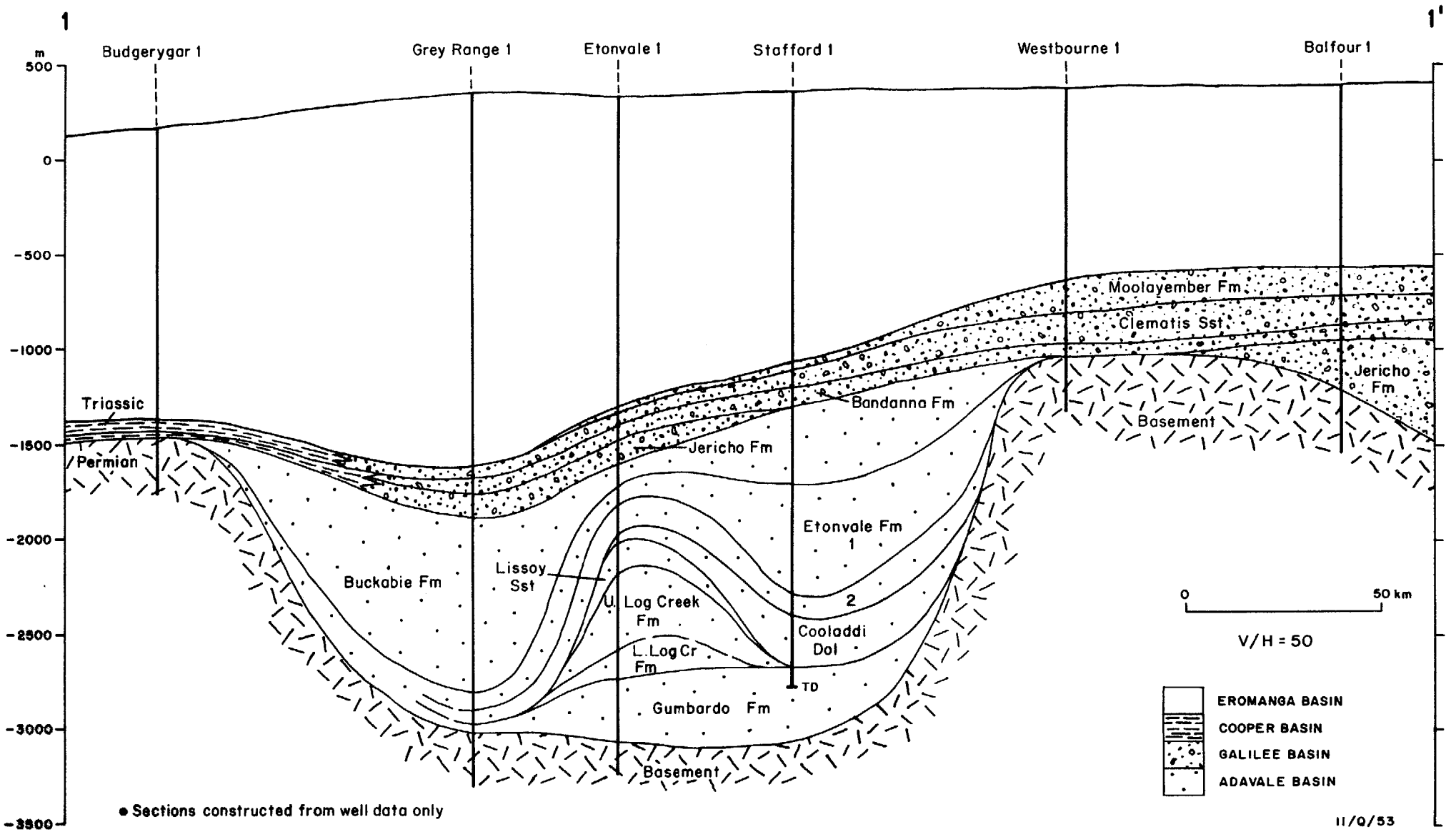

Fig.29. Rock relationship diagram along Cross-section 1-1'

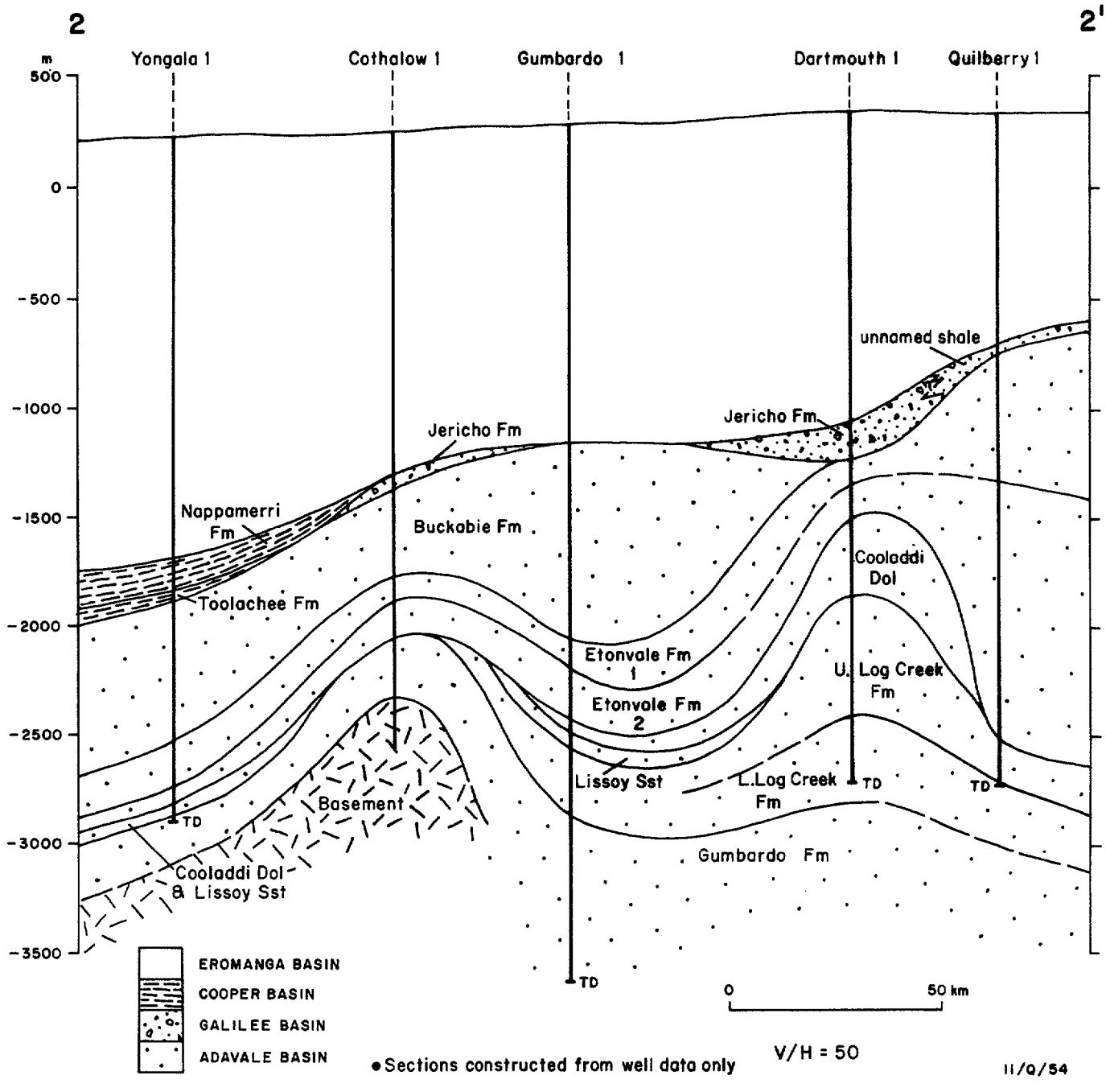

Fig.30. Rock relationship diagram along Cross-section 2-2'

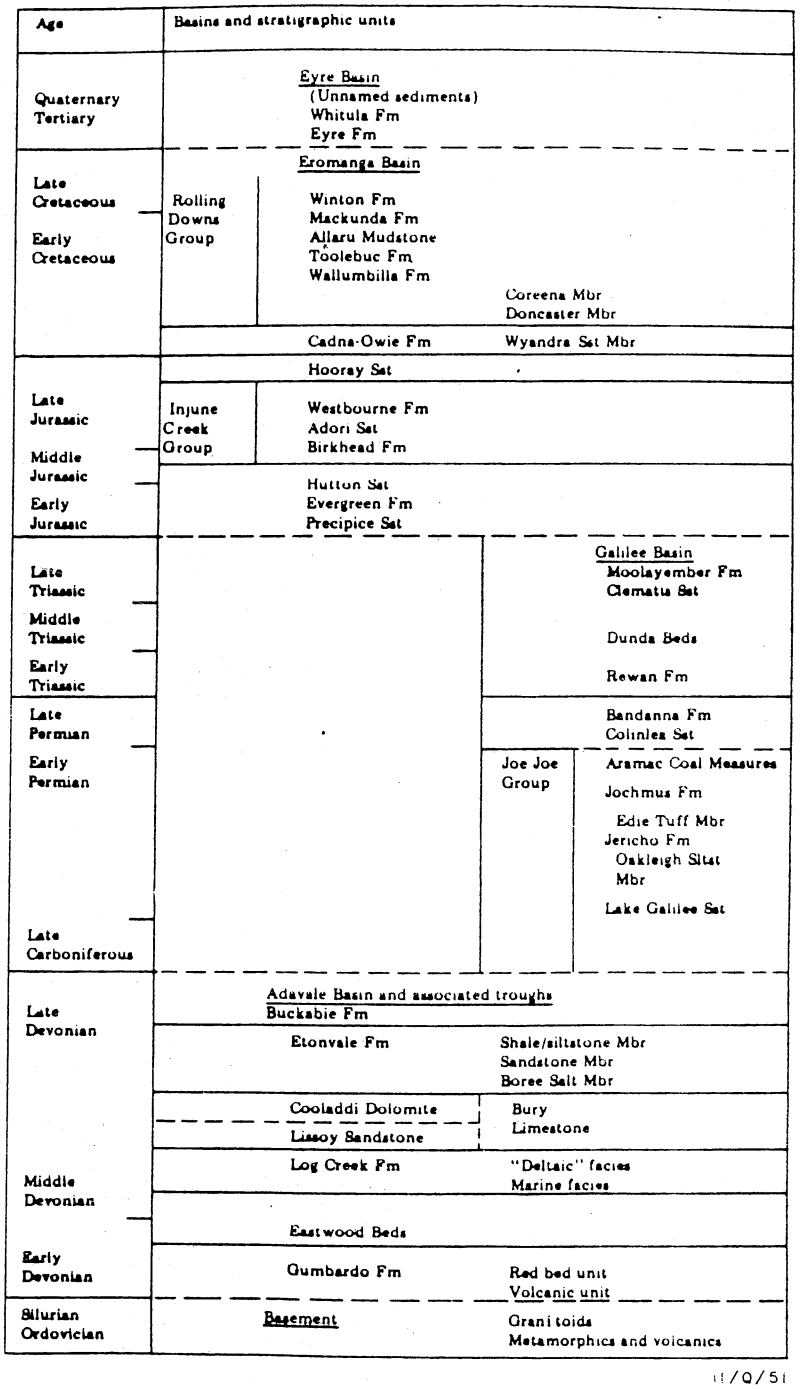

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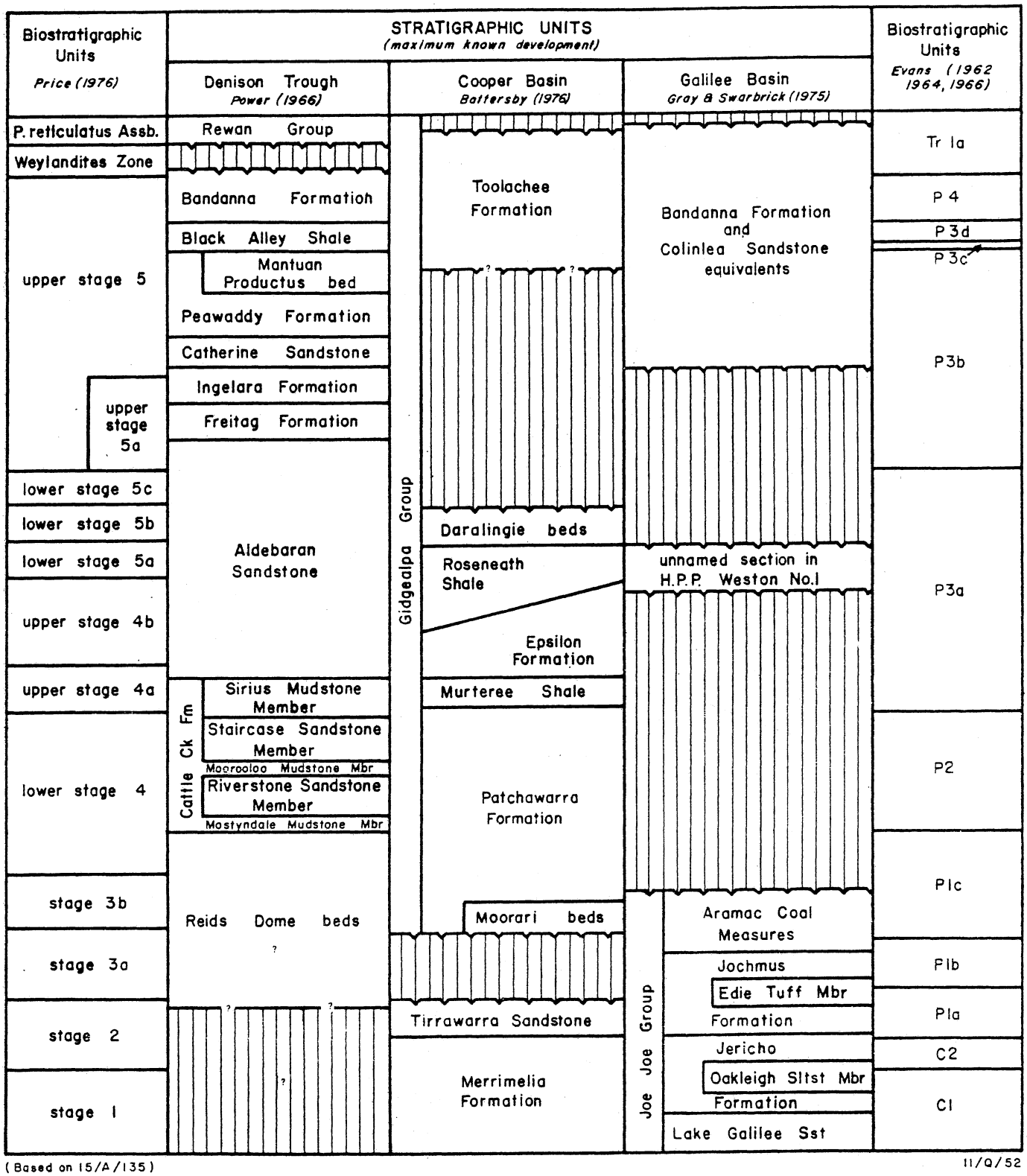
Table 1. Stratigraphy of the central Eromanga Basin



(Based on 15/A/135)

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Table 2. Eastern Australian palynological stages and their distribution in lithostratigraphic units of the Bowen, Cooper and Galilee Basins