COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

PETROLEUM SEARCH SUBSIDY ACTS

Publication No. 27

EUMAMURRIN (NORTH ROMA) SEISMIC SURVEY, QUEENSLAND, 1959-1960

BY

ASSOCIATED AUSTRALIAN OILFIELDS N.L.

Issued under the Authority of Senator the Hon. W. H. Spooner,
Minister for National Development

1961

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

Minister: SENATOR THE HON. W. H. SPOONER, M.M.

Secretary: H. G. RAGGATT, C.B.E.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

Director: J. M. RAYNER

This Report was prepared for publication in the Geophysical Branch

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FOREWORD.

In 1959 the Commonwealth Government enacted the Petroleum Search Subsidy Act 1959, under which companies proposing to drill for new stratigraphic information or to carry out either geophysical or borehole surveys in search of petroleum could be subsidised for the cost of drilling or of survey operations approved by the Minister for National Development.

The Bureau of Mineral Resources, Geology and Geophysics is required, on behalf of the Department of National Development, to examine the applications, maintain surveillance of the operations and in due course publish the results.

A seismic survey was carried out under the Petroleum Search Subsidy Act 1959 in the North Roma area of Queensland by Associated Australian Oilfields N.L. This Publication deals with that survey and contains information furnished on behalf of Associated Australian Oilfields and edited in the Geophysical Branch of the Bureau of Mineral Resources. The final report was written by Mr. W. E. Hightower, Supervisor, Austral Geo Prospectors Pty. Ltd. The methods of carrying out the seismic survey and the results obtained are presented in detail.

CONTENTS.

ILLUSTRATIONS.

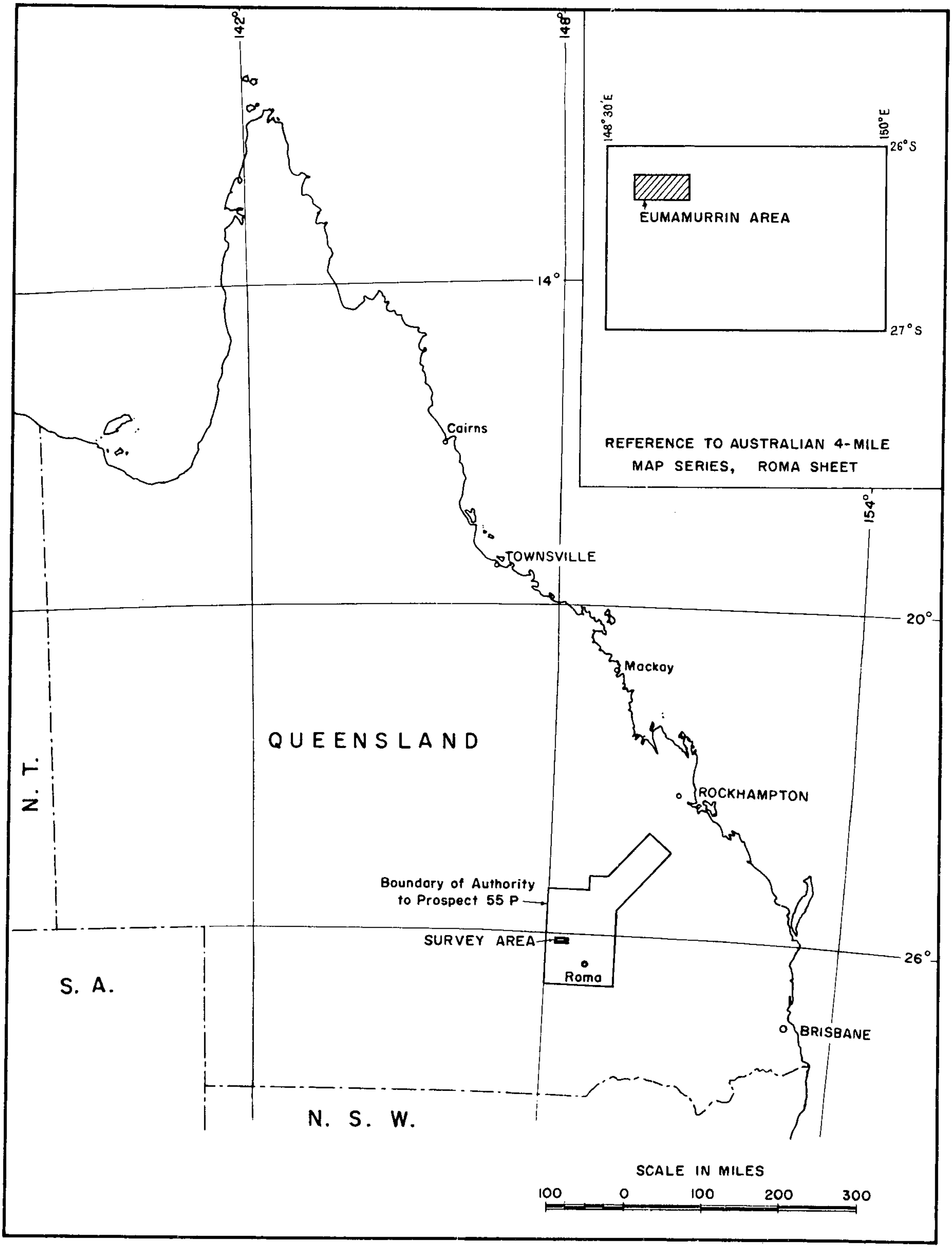

Fig. 1. LOCALITY MAP

ABSTRACT.

A reflection seismic survey was conducted in 1959-60 on Authority to Prospect 55P by Austral Geo Prospectors Pty. Ltd. for Associated Australian Oilfields N.L. through their management affiliate, Mines Administration Pty. Ltd., in an area approximately 30 miles north of Roma, Queensland.

The primary purpose of the survey was to determine whether the sedimentary section thickened northward into a geologic basin postulated to exist north of the Roma area. A secondary objective was to outline any structure that might be disclosed by the initial lines of survey.

Data obtained show a rapid thickening of section towards the north and east of the junction of Eumamurrin and Bungil Creeks. A pronounced structure was outlined in the vicinity of land portion 8, Parish of Eumamurrin and land portions 43V and 55V, Parish of Gubberamunda.

1. INTRODUCTION.

A reflection seismic survey was conducted in 1959-60 on Authority to Prospect 55P by Austral Geo Prospectors Pty. Ltd. for Associated Australian Oilfields N.L. through their management affiliate, Mines Administration Pty. Ltd. The area covered by the survey (see Figure 1) lies approximately 30 miles north of Roma, Queensland. Eumamurrin Creek runs through the centre of the area, lending a locality name to the prospect designation of "North Roma (Eumamurrin) area". For purposes of simplicity in prospect reference, the name has been shortened to "Eumamurrin area" in this report.

Geologic postulation had indicated that somewhere in the vicinity of the prospect area there should be considerable northward thickening of sedimentary rocks. The primary purpose of this survey was to determine whether the subsurface conditions are as postulated and whether a geologic basin exists north of the Roma area.

The secondary purpose of the survey was to determine subsurface conditions and to outline any structures noted during the initial part of the survey which appeared favourable to the accumulation of oil or gas.

Topography is fairly rough over this area and the surface elevations show a variation of approximately 300 feet. Most of the surface is cut by numerous gullies, covered by dense scrub timber, and traversed by few roads. Surveying the area with truck-mounted equipment required the use of a bulldozer.

Variations in near-surface conditions from hole to hole made it difficult to obtain good-quality reflections without adopting complex and expensive shooting procedures. Such procedures were not adopted as it was considered that the primary objectives of this survey could be achieved by the use of simple field techniques.

No tests have been drilled on the portion of this area where detailed seismic work was conducted. The only bore to which the survey was tied was Stewarts Mooga Bore drilled in 1934, in which metamorphic rock was reported at a depth of 3220 feet. No oil or gas shows of consequence were encountered although Reeves (1951) tabulates several oil shows for this bore in his statistical summary of exploration bores drilled in the Roma-Springsure Basin.

The A.R.O.[1] No. 2 and Q.R.O.[1] No. 1 Bores were drilled many years ago at some point approximately two miles south of the seismic Shot-point 47, and shows of oil and gas were encountered in the Triassic. Metamorphic rock was reported at a depth of approximately 2800 feet in the A.R.O. Bore.

Approximately ten miles west of the prospect area, in the Lander No. 1, 2, and 3 Bores, shows of oil and gas were discovered in the Triassic. In the Lander No. 2 Bore, the granite basement was reported at a depth of 2840 feet.

Footnote by Bureau of Mineral Resources

(1) Abbreviations used :-

A.R.O. Australian Roma Oil Corporation Ltd.

Q.R.O. Queensland Roma Oil Co.

Approximately 34 miles due north of the prospect, a bore drilled on the Hutton Creek Anticline by Oil Search Ltd. in 1939 produced oil and gas shows in the Permian. In this bore, Permian sediments were encountered at 650 feet. The bore was bottomed in Permian[(2)] at 4688 feet.

Bores to the south, west, and north-west of this area (within a 15-mile radius) appear to be on a general basement "high" which has Triassic sediments resting directly upon either granite basement or metamorphic rocks. Shows of oil or gas encountered in these bores have been from the Lower Triassic. Shows from the Hutton Creek Bore were from the Permian. On the basis of these shows it seems that potential reservoir rocks in both Triassic and Permian sediments may exist in the Eumamurrin area.

The Bureau of Mineral Resources conducted gravity and magnetic surveys near Roma in 1947 and 1948. Dooley (1950) gives full results of these surveys. In the Eumamurrin area, however, there is insufficient gravity or magnetic control to permit any comparison of results obtained by the different geophysical methods. Results elsewhere in the Roma area indicate that gravity or magnetic surveys would be useful only on a broad regional basis and would be of questionable value in outlining local structure.

2. GEOLOGY.

As no bores have been drilled in or to the immediate north or north-east of the Eumamurrin area, it is doubtful whether an accurate picture of the stratigraphy can be shown. Although no Permian rocks have been reported to the south or south-west, seismic evidence points strongly towards the possibility that the area surveyed lies on the south-western rim of a deep basin which could have a considerable thickness of Permian beds. The postulated stratigraphic cross-section presented below is based on the scanty evidence available.

JURASSIC	Blythesdale Group	200 feet
	Walloon Coal Measures	1200 feet
TRIASSIC	Bundamba Group	800 feet
	Moolayember Formation	600 feet
PERMIAN	?	Variable
PRE-PERMIAN	?	?

Footnote by Bureau of Mineral Resources

(2) Recent examination of the cores from the bottom of this bore places some doubt on the bore still being in Permian at total depth, as a sequence of steeply dipping indurated beds was drilled in the last six hundred feet of hole.

There is some question[3] as to whether the Bundamba Group and the Moolayember Formation are of Jurassic or Triassic age. However, the division shown above has been generally accepted in past reports on this area. There is not enough information on the Permian to justify any postulation except that probably Permian sediments are present in the Eumamurrin area. In a bore at Wallumbilla, 30 miles south-east of the Eumamurrin area, over 700 feet of Permian rock was penetrated. The Hutton Creek Bore, 34 miles north, was drilled through over 4000 feet of Permian sediments and bottomed in Permian.[4]

Subsurface data indicate that the local area covered by the seismic survey is bounded on the south-west by a basement "high" which trends from north-west to south-east and plunges to the south-east. A sedimentary sequence (2000-4000 feet) of Triassic and post-Triassic beds overlies basement on this ridge. The area is bounded on the north-east by a basin or sub-basin with sedimentary rocks of unknown thickness. The limits of this basin have not yet been defined.

3. METHODS OF OPERATION AND INTERPRETATION.

(a) Field Procedure.

The entire survey was conducted using the continuous profile method of reflection seismic prospecting. Approximately half of the shot-points were used initially to provide a single long "L" shaped traverse for regional coverage. Varying surface conditions and geological outcrops yielded records along this line ranging in quality from good to unusable. Approximately 20 shot-points, located on the outcrop of the Gubberamunda Sandstone, yielded records which were completely unusable. The remaining shot-points of the survey (exclusive of those on the long regional line) were aligned in a pattern to provide loose coverage and some detail over a pronounced subsurface structural feature disclosed by the initial traverse in the vicinity of Eumamurrin Creek.

Analysis of results obtained from this preliminary survey indicates that, in future operations, more elaborate field techniques should be used in portions of the area to provide data of better quality. Cross-spread information for three-dimensional dip and strike computations should be obtained in the area of steeply dipping beds.

(b) Presentation of Results.

The results of the seismic survey are presented in this Publication as structural contour plans and migrated cross-sections. The following additional data have been filed with the Bureau of Mineral Resources, and are available for future references :-

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Footnotes by Bureau of Mineral Resources

(3) Recent palaeontological evidence, especially from microfloral studies, has shown that the Transition "beds" of the Blythesdale Group are Cretaceous and the remaining units of the Group are Jurassic; the evidence also shows that the Bundamba Group is of Jurassic age and the Moolayember Formation is Jurassic and Triassic in age.

(4) See footnote (2).

(i) a complete set of record sections.
(ii) a complete set of shot-hole drill logs.
(iii) a complete set of cross-sections.

(c) Interpretation Procedure.

Corrected time data for preliminary and progress maps were determined by use of the normal up-hole method of low-velocity layer computation (based on corrections to a datum plane 1100 feet above sea level and an elevation velocity of 8000 feet/sec.). These early computational assumptions appeared to be completely adequate to handle the problems involved and were unchanged for final analysis.

The basic problem of analysis was the resolution of steep dips and the obviously complex structure of the deeper formations into an integrated geologic picture. In the absence of cross-spreads at any of the critical points, the solution of the three-dimensional problem had to be resolved from information obtained from two-dimensional components of dip. Data used on the maps were obtained by the following steps :-

(i) Cross-sections were prepared for each line of traverse using a 1 to 1 ratio between the horizontal and vertical scale at an assumed constant velocity of 10,000 feet per second at all depths. This velocity assumption is obviously incorrect, but it is a convenient one, and possibly no more inaccurate than any other assumption that could be made on the basis of present information.

(ii) Data are plotted on the cross-sections in a displaced position to show the component of dip shadowed by the true dip upon the two-dimensional vertical plane along the line of traverse. Although each point was plotted at the proper position for both horizontal displacement and vertical depth, the reflection time showing on the record rather than the computed vertical time was recorded at the displaced point for purposes of ready record reference.

(iii) Data used on the maps for the two mapping horizons were picked directly off the cross-section (using the depth scale) to the nearest 20-ft. marker. The point of reference (or the picking point) in each instance is the intersection of the vertical line drawn from the shot-point to the mapping horizon.

4. INTERPRETATION OF RESULTS.

(a) Faulting.

Two periods of faulting, both of fairly recent geologic age, are postulated to cut each of the mapping horizons. Faults labelled as 1, 2, and 5 and shown on maps and cross-sections are interpreted to be thrust faults caused by a thrusting force from the south or south-east. Faults labelled 3 and 6 on maps and cross-sections are interpreted to be normal faults, and to have occurred at some period of disturbance later than that responsible for the thrust faulting. The fault labelled as No. 4 was difficult to place with either of the above two periods of faulting. It is believed, however, that Fault No. 4 is a normal fault and associated with Faults 3 and 6 but complicated for analysis because it intersects Fault 2 at the level of Zone A (post-Permian) between Shot-points 1 and 28 and Shot-points 1 and 190.

Fault A appears to be of reverse type, of an age older than either of the two systems discussed above, and apparently does not extend upwards through Zone A.

The attitude of the reflections deeper than the mapping horizons suggests that the fracture pattern at depth is considerably more complicated than that shown by maps of either Zone A or Zone B.

Some of the odd dips shown on some of the cross-sections may be the result of reflections from low-angle fault planes.

(b) Unconformities.

A very pronounced angular unconformity is shown by all cross-sections to lie between Zone A and Zone B. In most instances, this unconformity probably lies a very few hundred feet below Zone A.

There is probably at least one additional unconformity below the level of Zone B and above basement.

(c) Surface Elevations - Plate I.

Plate I shows the surface elevations at each shot-point plotted and contoured. The contour procedure used is the same as that followed for contouring subsurface data so that any close association between topography and subsurface structure may be noted.

There is a fairly close similarity between surface topography and the structure shown by Zone A in the northern part of the detailed portion of the prospect area. It is possible that the position of the Eumamurrin Creek has been controlled to some degree by some of the recent faulting. There may be other places of agreement, but they are not obvious. There is little, if any, similarity between surface elevation and structure as shown by the map on Zone B.

The extremely poor-quality records obtained along the southern edge of the prospect area were attributed to unfavourable energy-carrying characteristics of the Gubberamunda Sandstone. Some liberties in determining configuration of surface contours were taken to see if the zone of "no reflection" records (NR) could be associated with a ridge or escarpment caused by the outcropping sandstone. The relationship seems quite apparent and is so marked on the accompanying map (Plate I).

(d) Zone A (Post-Permian) Plate II.

The shallow reflections are of good quality over most of the prospect area. Zone A, which is indicated by this shallow group, bears the same general structural relation to Zone B as the Jurassic (Walloon Coal Measures) bears to the Triassic or Permian formations in the East Roma and South Roma areas. Using this comparison as a basis, it is concluded that Zone A definitely represents post-Permian structure and possibly post-Triassic structure.

Structure at the level of Zone A is characterised by general southerly or south-easterly dip interrupted by a fairly complex system of faulting and minor folding. No feature displaying complete structural closure is revealed by Zone A data. The pronounced structural feature shown by Zone B in the vicinity of Eumamurrin Creek is not apparent at the level of Zone A. The area over the crest of the deep-seated structure is anomalous, however, as it is displayed as a "step" graben with some of the blocks being almost completely devoid of significant dip in any direction.

Fault 1, discussed in earlier paragraphs, is postulated to extend towards the east or south-east and to cut the long regional line of traverse at four points. The fault as drawn (based on very poor data) is roughly parallel to the alignment of the outcrop of the Gubberamunda Sandstone (postulated from surface elevations and "NR" records and shown on the elevation map). Two additional breaks in continuity, along the regional line north-eastward from Fault 1, appear to be possible faults. The direction of throw would allow these breaks to represent extensions of Faults 2 and 3.

In the analysis of shallow data, and in making the structural interpretation for Zone A, an attempt was made to eliminate some of the faulting shown on the cross-sections and maps. In each instance the removal of a fault or faults yielded data that were much more difficult to contour into a sensible geologic picture than were the data shown on accompanying maps.

(e) Zone B (Possible Permian) - Plate III.

Data shown on the map designated "Zone B" (Possible Permian) were derived from a part continuous horizon, part phantom horizon process. Positive correlation across fault zones is difficult if not impossible. Fault displacements determined by correlation of the shallow reflections were used as a guide in selecting possible equivalent positions for Zone B on the two sides of a fault. In the choice of a mapping zone, several trial runs were made to make certain that the position of the mapping zone in all fault blocks was well below the pronounced unconformity lying between Zone A and Zone B.

As the survey was completely reconnaissance in nature, no traverse occupied a position perpendicular to strike. The absence of detailed control for the third dimension of steep dip forced the use of a phantom horizon for at least part of the data even though the desired mapping horizon was believed to be present on the cross-section.

Data determined for Zone B by the procedures outlined are believed to be fairly representative of the existing structural conditions within the Permian strata. Dip is established in all directions away from a generally high area centred about Shot-point 134. Additional structural complications other than those shown are undoubtedly present. A number of erratic dips appearing on the cross-sections near the mapping zone, and some pronounced shifts in the position of the dominant reflections, were ignored in the interpretation.

The postulated fracture pattern crossing the structure allows a multiple choice for the location of a drill site for an initial test. Drill sites listed in the order of preference are : (1) near Shot-point 190, (2) near Shot-point 200, (3) near Shot-point 129, and (4) near Shot-point 189.

(f) Interval - Zone A to Zone B - Plate IV.

The map showing the interval between Zone A and Zone B reflects the structure of Zone B. The positions of the faults are shown for both mapping levels. Those areas lying between the vertical projections of fault traces at the two different levels, have been shaded to mark them as zones where a drill test should pass through a fault plane.

The contour interpretation in the south-western portion of the survey (or in the vicinity of the land portion 55V) is highly speculative. However, if data are contoured to preserve the direction of displacement along the faults, each of the fault blocks in this area shows some eastward thickening of sediments. If such thickening is assumed, then the crest of the deep structure (ignoring faulting) might extend towards the south and west to cover parts of land portions 7, 55V, and 53V.

(g) Cross-sections - Plates V and VI.

The cross-sections show the data and the interpretation from which the maps were constructed. Undoubtedly, many of the apparent erratic dips shown on the cross-sections are reflected from points outside the plane of the cross-section and have no association with structure within the plane of the cross-section. Two cross-sections are printed at the back of this report. Plate V is the migrated cross-section for part of Line 1 (Shot-points 126-138 incl.) and Plate VI is the migrated cross-section for Line B.

5. CONCLUSIONS.

A complexly faulted but pronounced subsurface structural feature is outlined by the survey. The highest point of structure is difficult to fix but the general crest of structure is centred about the western part of land portion 8, the north-western part of land portion 43V, and the north-eastern part of land portion 55V.

The feature is believed to be outlined sufficiently by current data to allow the attached maps to be used in selecting a site for an initial drill test. Possible drill sites, in the order of preference based on seismic data alone, are :

1. Near Shot-point 190
2. Near Shot-point 200
3. Near Shot-point 129
4. Near Shot-point 189

If a test is drilled and the results are encouraging, the survey should be extended. The field technique should be designed to fit the specific problems of the area. In areas of steep dip, cross-spreads are necessary to provide accurate three-dimensional control. Experimental work is necessary in the areas of geological outcrops, e.g. the outcrop of the Gubberamunda Sandstone, to determine the proper field procedure for recording the deeper reflections.

Specific recommendations for a continued programme are as follows :

1. Extend the area of detailed coverage toward the south-west, because data on some of the maps suggest that the complex structural feature, partially

mapped by this survey, could be quite large and may extend for a mile or two in this direction.

2. Extend some of the radial lines across the structure to a greater distance from its crest and connect all these radial lines by a traverse around the flanks of the feature to provide a more accurate determination of the structural relation between the various fault blocks.

3. Investigate some of the areas of anomalous dips shown by the long east-west regional traverse, Lines 2, F, and 3.

ACKNOWLEDGEMENTS.

The author is indebted to a number of persons. They have each made a material contribution toward the contents of this report. Their contributions include the assembly of information, the interpretation of seismic data, and the derivation of the conclusions from the final data. The author wishes to acknowledge the contributions made by D. M. Traves and S. S. Chambers of Mines Administration Pty. Ltd.; H. S. Eshelman and H. M. Thralls of Geo Prospectors, Inc.; and all the other unnamed persons and organizations who have aided in this work or contributed to the geological knowledge of the Roma area.

REFERENCES.

DOOLEY, J. C. 1950 Gravity and magnetic reconnaissance Roma district, Queensland. Bur. Min. Resour. Aust. Bull. 18

REEVES, F. 1951 Australian oil possibilities, Bull. Amer. Ass. Petrol. Geol. 35, 2479-2525.

APPENDIX I.

FIELD PROCEDURE.

Type Geophones Used:	SIE S16 18 c/s
Number per Trace:	5 and 3
Connection:	Series
Spacing in Group:	20 feet - 5 geophones used 15 feet - 3 geophones used
Type Amplifiers:	Century (Modified)
Number of Channels:	24
Normal Filter Settings:	32 - 78 c/s
Mixed or Unmixed:	Mixed and Unmixed
Spreads Used:	Straddle, 1320 feet
Method Used:	Continuous profiling
Distance from Shot-point to Close Geophone Stations:	110 feet to 150 feet
Relation of Far Geophone Stations to Interlocking Shot-points:	At interlocking shot-points
Normal Dynamite Charge:	30 pounds
Difficulties:	Drilling difficult due to sand, gravel and small "boulders" in hole. Terrain rough. Poor reflection quality over part of the area

APPENDIX II.

CALCULATION AND INTERPRETATION METHODS.

Wells Tied:	1 well tied on eastern extremity of single line-traverse. Could not be tied back to main portion of seismic work
Correction Used:	Normal up-hole
Interlock Ties Used:	Datum-to-datum
Vertical Velocity (Ve):	8000 feet/second
Elevation Datum:	+ 1100 feet
Horizons Mapped:	Zone A (Post-Permian) Zone B (Possible Permian)
Intervals Mapped:	Zone A to Zone B

Note: Conversion of time data to depth is described in the body of report.

APPENDIX III.

LOCATION, PERSONNEL, AND EQUIPMENT.

Crew Headquarters:	Roma, Queensland
Party Chief:	W. E. Hightower
Observer:	G. W. Pippin
Party Manager & Driller:	G. P. Hughes
Surveyor:	C. J. Morrow D. P. Kenyon A. M. Wilson
Recording Unit:	24-trace Century recording unit, filter range of 20-120 c/s mounted on F-600 Ford truck. Shooting truck (F-600) including water tank, storage compartments for explosives, etc.
Drill Unit:	Mayhew-1000 drill mounted on F-600 Ford. Water truck (F-600 Ford) with 1000-gallon tank
Survey Unit:	Plane table and alidade used for surveying. F-100 Ford pick-up used for survey vehicle

APPENDIX IV.

STATISTICS.

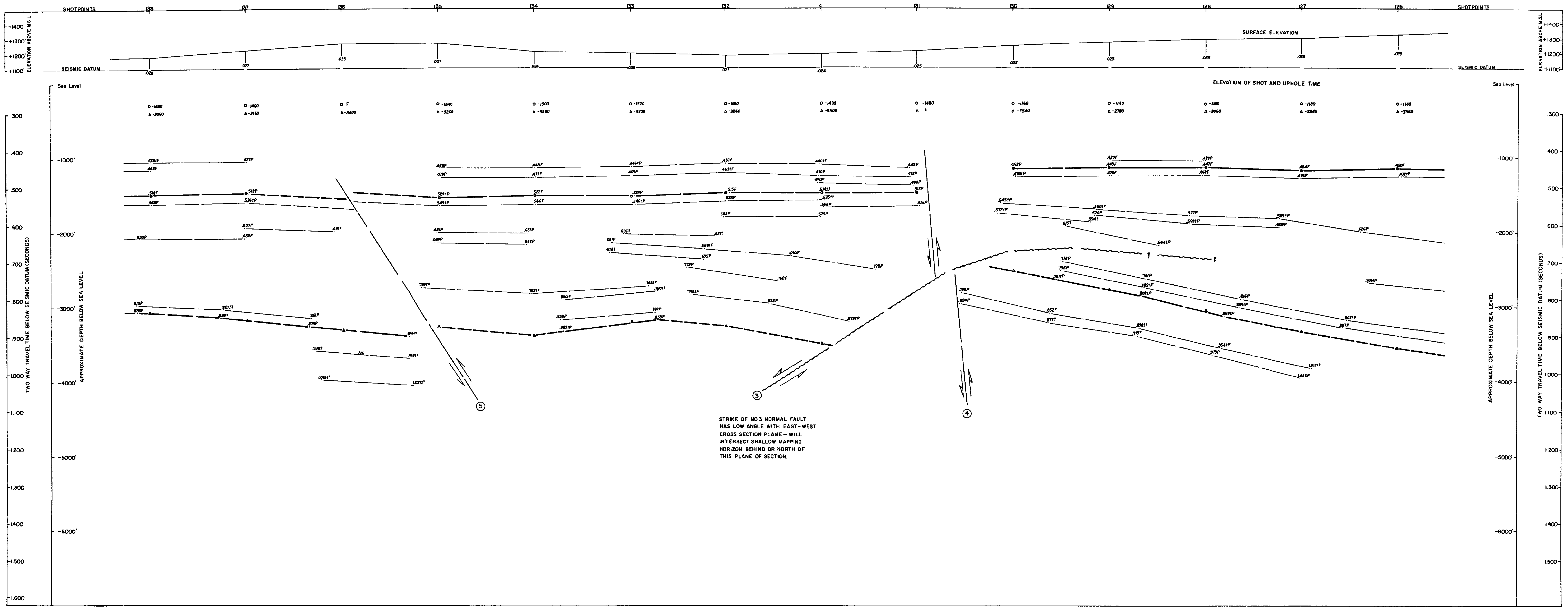
Starting Date:	17th August, 1959
Completion Date:	22nd February, 1960
Recording Time:	
Drive to and from field -	76.0 hours
Field -	315.0 hours
Move -	0.0 hours
Holidays -	40.0 hours
Lost due to weather -	10.0 hours
Lost due to equipment failure -	0.0 hours
Holes Shot:	227 holes
Miles of Traverse:	55 miles
Number of Drills Used:	1
Drill Time:	
Drive to and from field -	84.0 hours
Field -	341.0 hours
Move -	0.0 hours
Holidays	40.0 hours
Lost due to weather -	10.0 hours
Lost due to equipment breakdown -	0.0 hours
Holes Drilled:	225 holes
Total Footage:	20,360 feet
Bits Used:	Twenty-three 4½-in. inserted 3-blade bits One 4 1/4-in. rock bit Two 5 5/8-in. inserted Kelly bits
Mud Used:	15 sacks
Bran Used:	17 sacks


PLATE I
REFLECTION SEISMOGRAPH SURVEY
OF THE
EUMAMURRIN AREA
QUEENSLAND
SHOWING CONTOURS ON
SURFACE ELEVATIONS
FOR
MINAD
BY
Austral
Geo Prospectors, Inc.
Brisbane, Queensland
MILES
Ve= 8000 f/s
Va= f/s
C.I. 20 ft
SEISMIC DATUM
MAP DATUM: Sea Level
DATE. OCT 22, 1960 INTERPRETATION BY.
NOTE Tops and geologic correlations are subject to question
STEWARTS - MODGA (1934)
Elev +1291
Top Triassic -179
Top Ipswich -1104
Top Basement -2219
Total Depth -2269
Oil Shows (-2027, -2136, -2156)
PARISH OF EUMAMURRIN
PARISH OF GUBBERAMUNDA
PARISH OF WHITHU
LINE B
LINE 1
ROMA INJUNE ROAD
TEN CHAIN ROAD
EUMAMURRIN CREEK
MOOGA MOOGA CREEK
STATE FOREST
GUBBERAMUNDA SANDSTONE OUTCROP
PROBABLE ZONE OF NO REFLECTIONS
ORALLO 8 MILES
+1400
+1300
+1200

PARISH OF EUMAMURRIN
PARISH OF GUBBERAMUNDA
PARISH OF WHITHU
ROMA INLINE ROAD
TEN CHAIN ROAD
STATE FOREST
ORALLO 8 MILES
EUMAMURRIN CREEK
MOOGA MOOGA CREEK
NOTE Tops and geologic correlations are subject to question
STEWARTS - MOOGA (1934)
Elev +1291
Top Triassic -179
Top Ipswich -1104
Top Basement -2219
Total Depth -2269
Oil Shows (-2027, -2136, -2156)
PLATE II
REFLECTION SEISMOGRAPH SURVEY
OF THE
EUMAMURRIN AREA
QUEENSLAND
SHOWING CONTOURS ON
ZONE A (POST PERMIAN)
FOR
MINAD
BY
Austral
Geo Prospectors, Inc.
Brisbane, Queensland
0 1 2
MILES
Ve= 8000 f/s Va= 10,000 f/s
C.I. 50 ft SEISMIC DATUM +1100 ft MAP DATUM: Sea Level
DATE OCT. 22, 1960 INTERPRETATION BY.


PLATE III
REFLECTION SEISMOGRAPH SURVEY
OF THE
EUMAMURRIN AREA
QUEENSLAND
SHOWING CONTOURS ON
ZONE B (POSSIBLE PERMIAN)
FOR
MINAD
BY
Austral
Geo Prospectors, Inc.
Brisbane, Queensland
MILES
Ve= 8000 f/s
Va= 10,000 f/s
C.I. 100 ft.
SEISMIC DATUM: +1100 ft
MAP DATUM: Sea Level
DATE: OCT. 22, 1960
INTERPRETATION BY:
PARISH OF EUMAMURRIN
PARISH OF GUBBERAMUNDA
PARISH OF WHITHU
STATE FOREST
TEN CHAIN ROAD
ORALLO 8 MILES


PARISH OF EUMAMURRIN
PARISH OF GUBBERAMUNDA
PARISH OF WHITHU
ROMA INJUNE ROAD
EUMAMURRIN CREEK
ORALLO 8 MILES
STATE FOREST
TEN CHAIN ROAD
MOOGA MOOGA CREEK
NOTE Tops and geologic correlations are subject to question
STEWARTS - MOOGA (1934)
Elev +1291
Top Triassic -179
Top Ipswich -1104
Top Basement -2219
Total Depth -2269
Oil Shows (-2027, -2136, -2156)
NOTE. Intermittent fault traces are at ZONE A level. Solid fault traces are at ZONE B level. Shaded areas indicate probable horizontal movement of the fault trace between mapping horizons. Intervals in shaded areas are measured through a fault plane
PLATE IV
REFLECTION SEISMOGRAPH SURVEY
OF THE
EUMAMURRIN AREA
QUEENSLAND
SHOWING CONTOURS ON
INTERVAL: ZONE A TO ZONE B
FOR
MINAD
BY
Austral
Geo Prospectors, Inc.
Brisbane, Queensland
0 1 2
MILES
Ve= 8000 f/s Va= f/s
C.I. 100 ft SEISMIC DATUM: MAP DATUM: Sea Level
DATE OCT 22, 1960 INTERPRETATION BY.



LEGEND

CONTINUITY GRADE

Good or Fair (Reliable)
Poor (Probable)
Questionable (Possible)
NC No Continuity

"Post-Permian" mapping horizon
"Possible Permian" mapping horizon
"Post-Permian" phantom horizon
"Possible Permian" phantom horizon
○ -1140 Depth of "post-Permian" mapping horizon below datum at shot-point
△ -4880 Depth of "possible Permian" mapping horizon below datum at shot-point

HORIZONTAL AND VERTICAL SCALE
IN FEET
0 1000 2000

PLATE NO V

REFLECTION SEISMOGRAPH SURVEY
OF THE

EUMAMURRIN AREA
QUEENSLAND

MIGRATED CROSS SECTION

LINE "I"

FOR

MINAD

BY

Austral Geo Prospectors, Inc.
Brisbane, Queensland

LEGEND

CONTINUITY GRADE

Good or Fair (Reliable)
Poor (Probable)
Questionable (Possible)
No Continuity

"Post-Permian" mapping horizon
"Possible Permian" mapping horizon
"Post-Permian" phantom horizon
"Possible Permian" phantom horizon
o -1140 Depth of "post-Permian" mapping horizon below datum at shot-point
Δ -4880 Depth of "possible Permian" mapping horizon below datum at shot-point

HORIZONTAL AND VERTICAL SCALE
IN FEET
0 1000 2000

PLATE NO. VI

REFLECTION SEISMOGRAPH SURVEY
OF THE

EUMAMURRIN AREA

QUEENSLAND

MIGRATED CROSS SECTION

LINE "B"

FOR

MINAD

BY

Austral
Geo Prospectors, Inc.
Brisbane, Queensland