BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

RECORD

1981/37

THE COMPUTER PROGRAM

'OYSHL'

by

Ian Donald

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CONTENTS

ABSTRACT

The computer program 'OYSHL' calculates and tabulates the summary of Australia's oil shale resources. The oil shale deposits are grouped into three economic categories; demonstrated oil shale resources, inferred oil shale resources and other oil shale deposits. Deposits are grouped by States.

The oil shale resources are reported in millions of tonnes of in situ mass, and in millions of cubic metres of oil recoverable at a given fischer assay yield.

The summary of Australia's demonstrated and inferred oil shale resources is published in the Petroleum Newsletter, and as a Press Release.

INTRODUCTION

Requests of information on Australia's oil shale resources from outside and within the Bureau necessitated the design of a computer program for documenting and updating oil shale resources on a quarterly basis.

The computer program 'OYSHL' is designed to tabulate the individual oil shale deposit resources and calculate total oil shale resources for Australia. The computer program generates a summary of Australia's Oil Shale resources (Appendix 4), which is distributed to officers outside the section. A distribution list appears in Appendix 4.

The record describes the computer program OYSHL and its data file SHALIE in managing the ongoing quarterly task.

RUNNING OYSHL

The algorithm designed to handle the task is described in Appendix 1 as a flowchart. The algorithm was programmed in fortran and called OYSHL (Appendix 2). The program uses the data file called SHALIE (Appendix 3). The program is run on a Hewlett-Packard Series F computer.

The program OYSHL divides the resources into three groups: demonstrated resources, inferred resources and all other known oil shale deposits. Each oil shale deposit has its geological sheet, age, in situ mass, yield and oil recoverable by Fischer assay described. The definition of these terms appears in Appendix 4. The program tabulates this information for each deposit and calculates the total in situ mass and total oil recoveralbe for each state. The totals for each State are then calculated and a total of Australia's demonstrated and inferred oil shale resources is documented.

The data file 'SHALIE' is segmented as follows; the first 57 lines contain the introduction to the report. The 68th line contains the total number of States, the 69th line cotains the name of the State, while the 70th line contains the number of deposits for the State and the number of lines of notes.

The next four lines contain:

1. Deposit name
2. 1:250 000 Sheet name
3. Age
4. In situ mass yield, and oil recoverable.

These four lines are repeated with information for each oil shale deposit.

Notes describing the source of information are listed after all the deposits have been tabulated for each table of figures (Appendix 4).

CONCLUSION

The OYSHL program is the first attempt to calculate and tabulate a comprehensive list of all known Australian oil shale deposits on a quarterly basis.

It is envisaged that the estimate of resources for each deposit will become more accurate as more geological and geophysical data become available. This computerised data base now provides a quick source of information on Australia's oil shale resources.

ACKNOWLEDGEMENTS

Computing advice and encouragement were received from Dennis Bennett, Warren de Courcy Browne, Bob Moore and Fay Newman. The format and contents of the report were discussed with David Gibson, Les Kurylowicz and John White.

REFERENCES

BMR 1976 - Australian Mineral Industry Quarterly Review, Vol. 28, 1, pp 11 - 13.

Hewlett-Packard 1975 - 9600 Series pocket guide Hewlett-Packard.

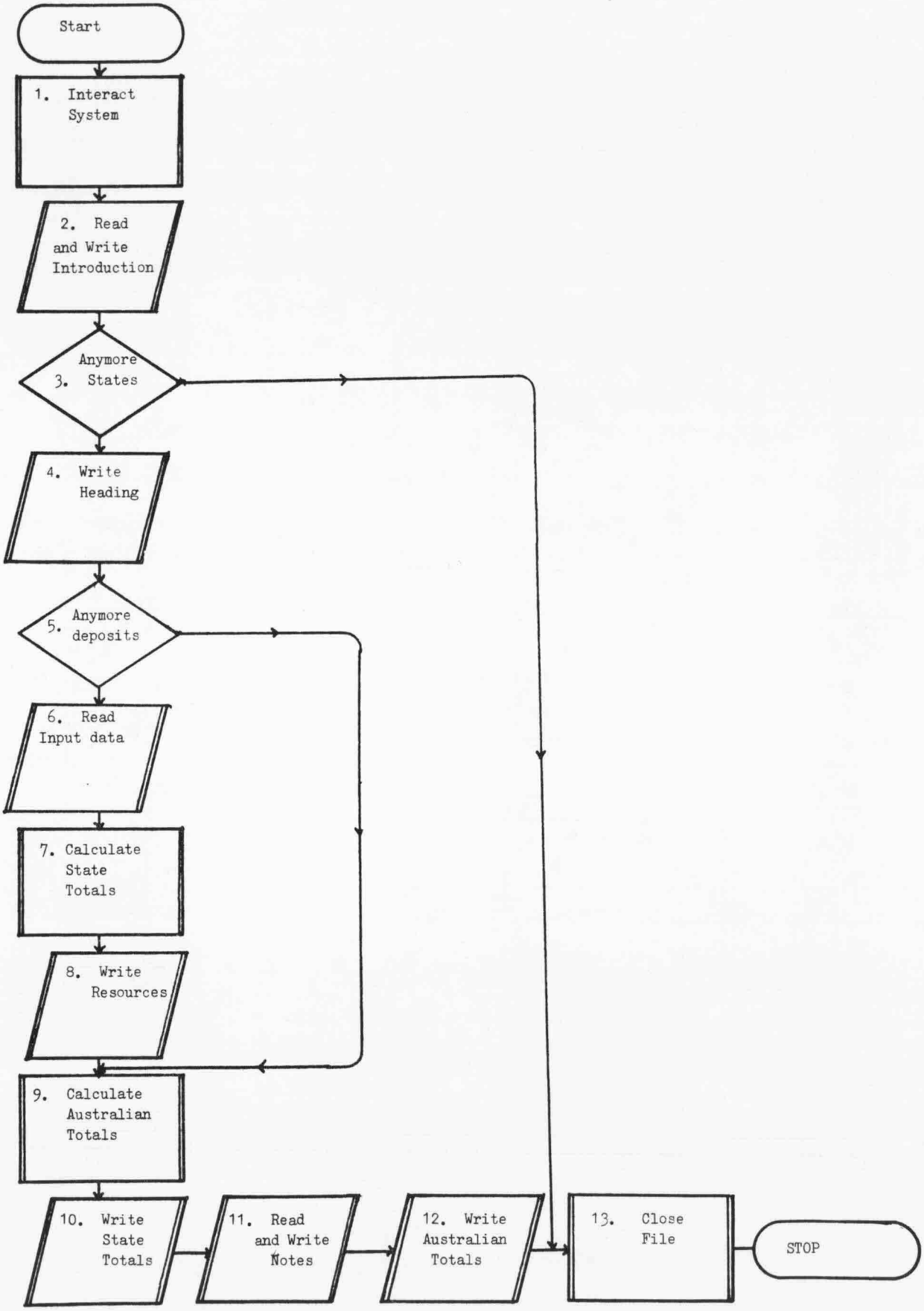
Gibson, D.L. and White, J.A.W. 1980 - Notes and a bibliography on Oil Shale in Australia. Bur. Miner. Resour. Aust. Rec. 1980/27.

Appendix 1

Flowchart of Algorithm

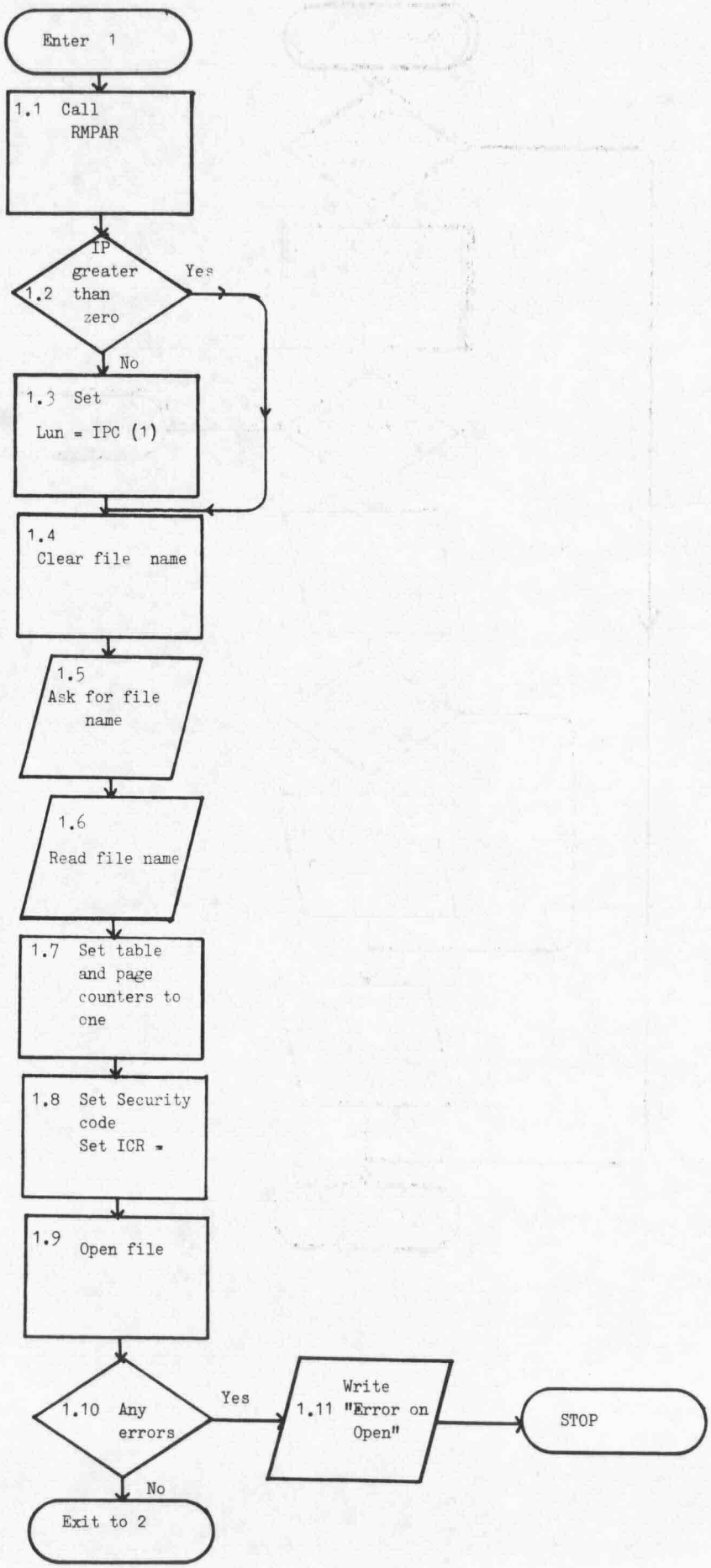
Level 1

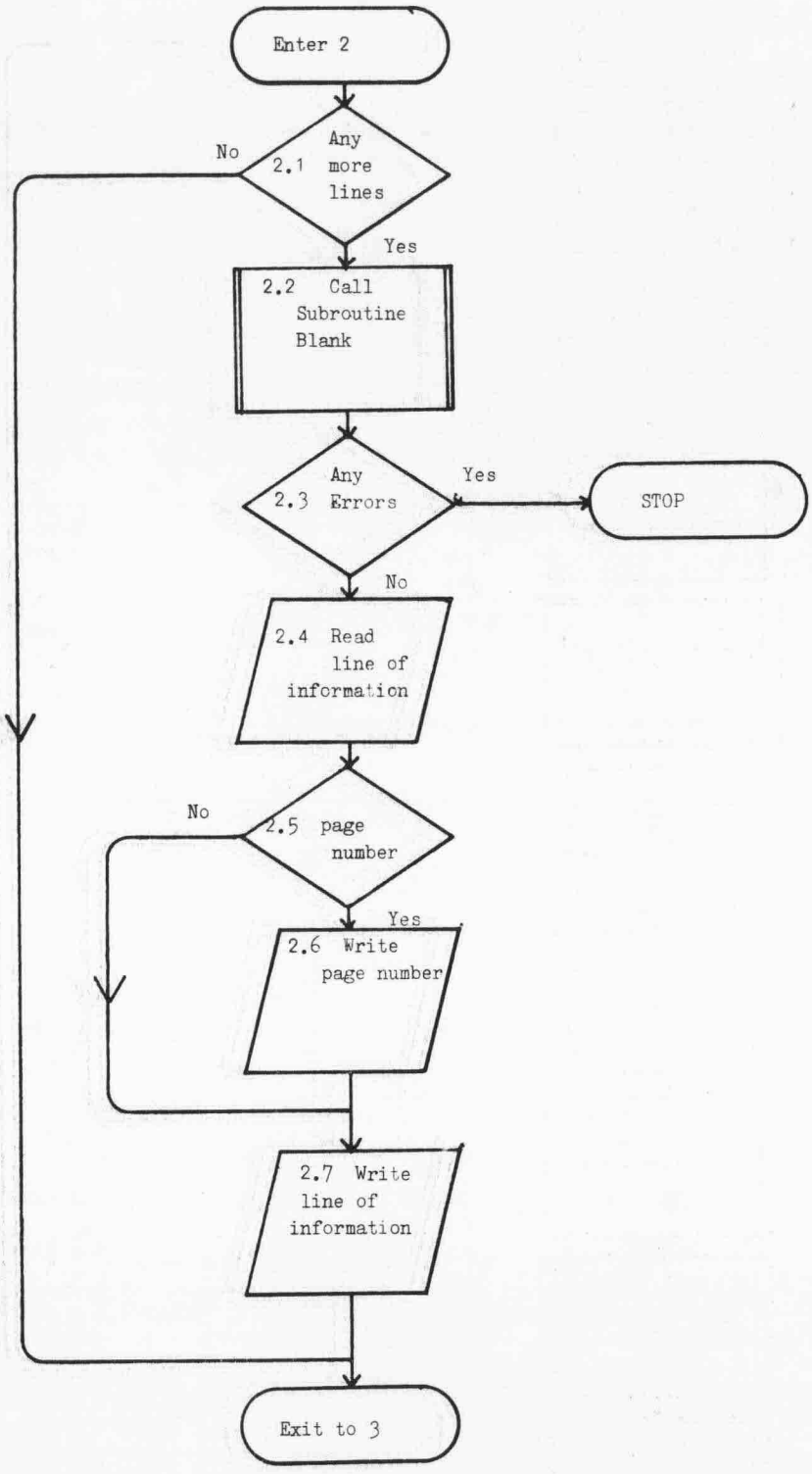
Flowchart of Algorithm



Level 2

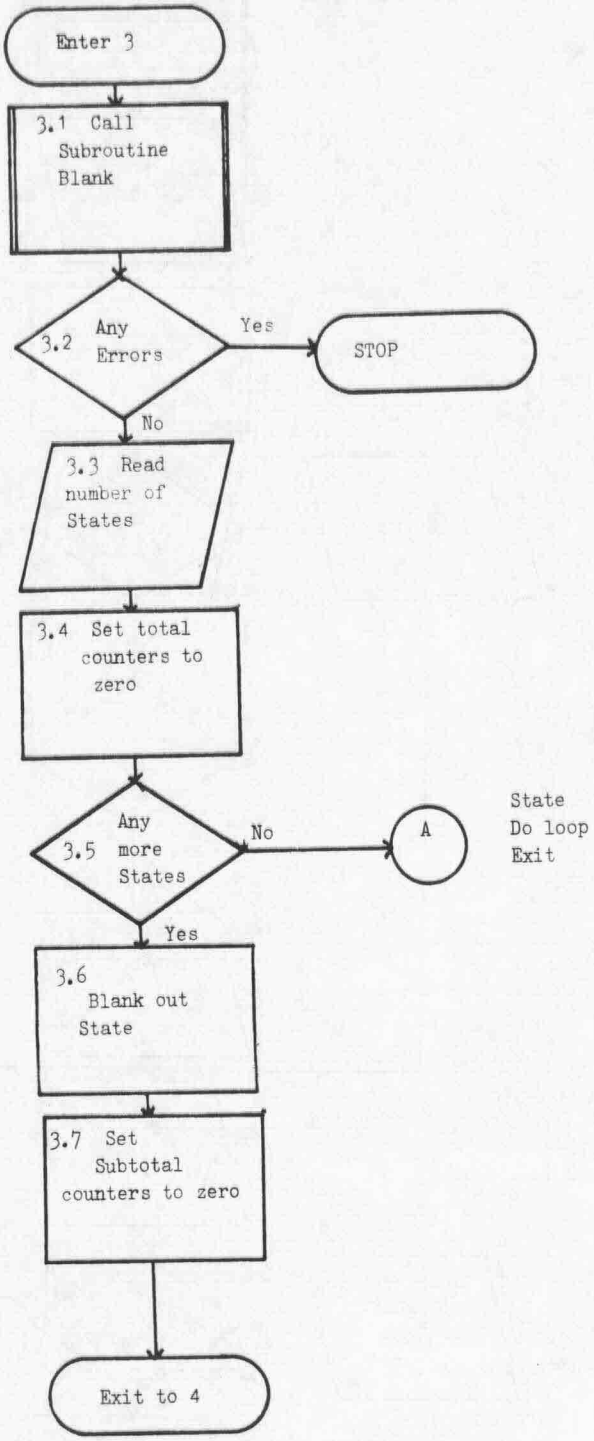
1. Interact System




Enter 2
Any more lines 2.1
No
Yes
2.2 Call Subroutine Blank
Any Errors 2.3
Yes
STOP
No
2.4 Read line of information
page number 2.5
No
Yes
2.6 Write page number
2.7 Write line of information
Exit to 3

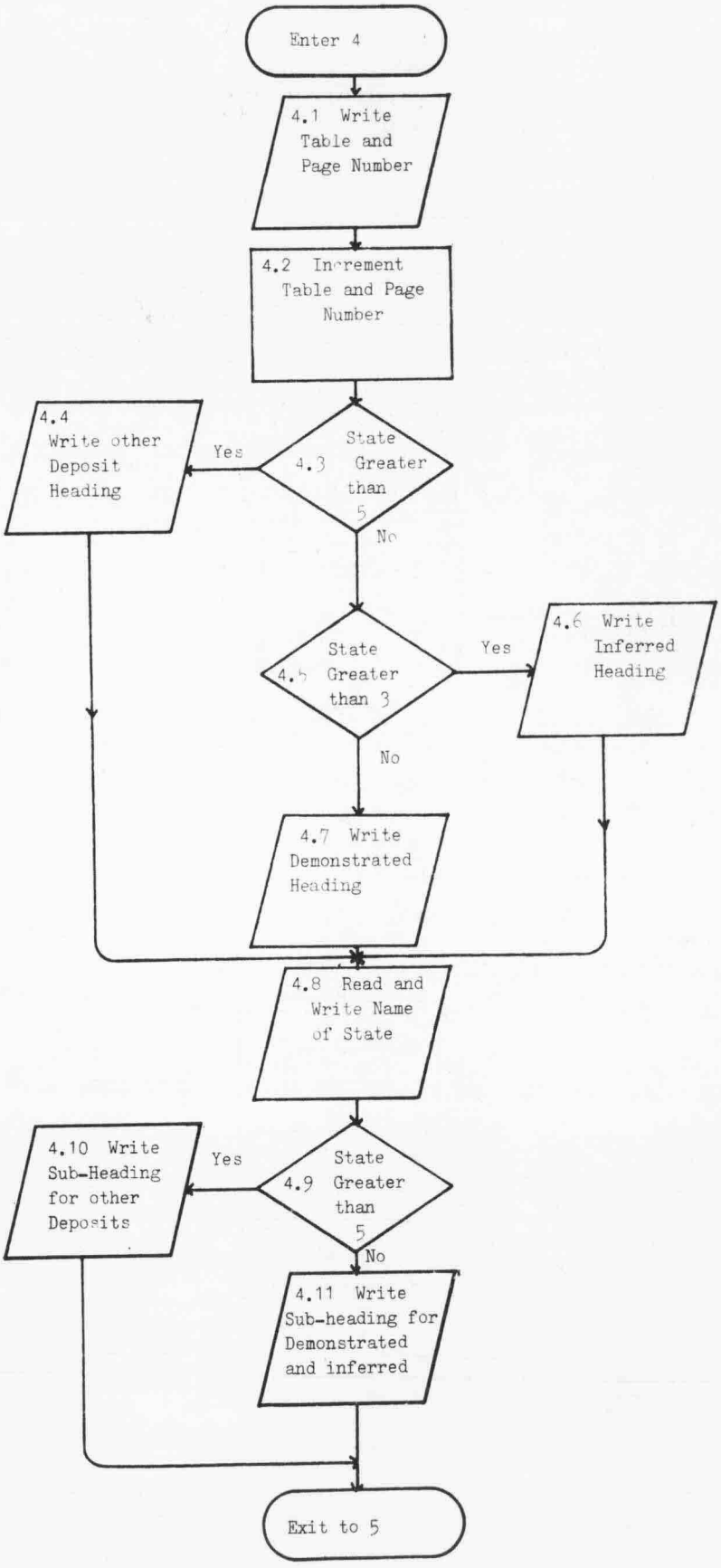
Level 2

3. Anymore States



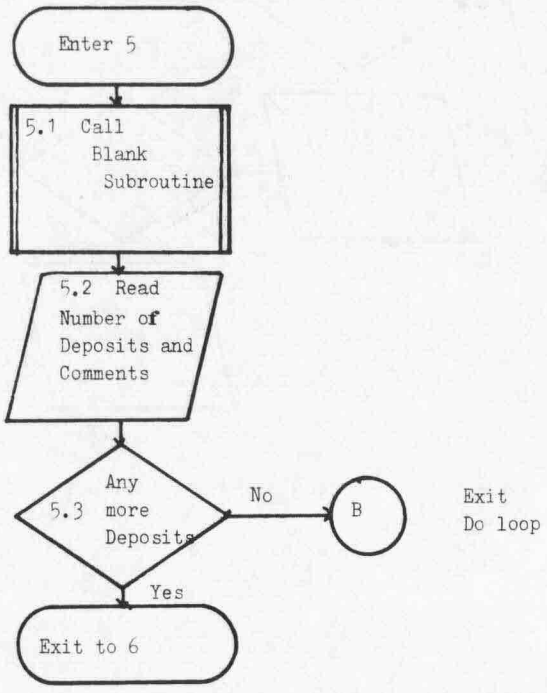
Level 2

4. Write Headings



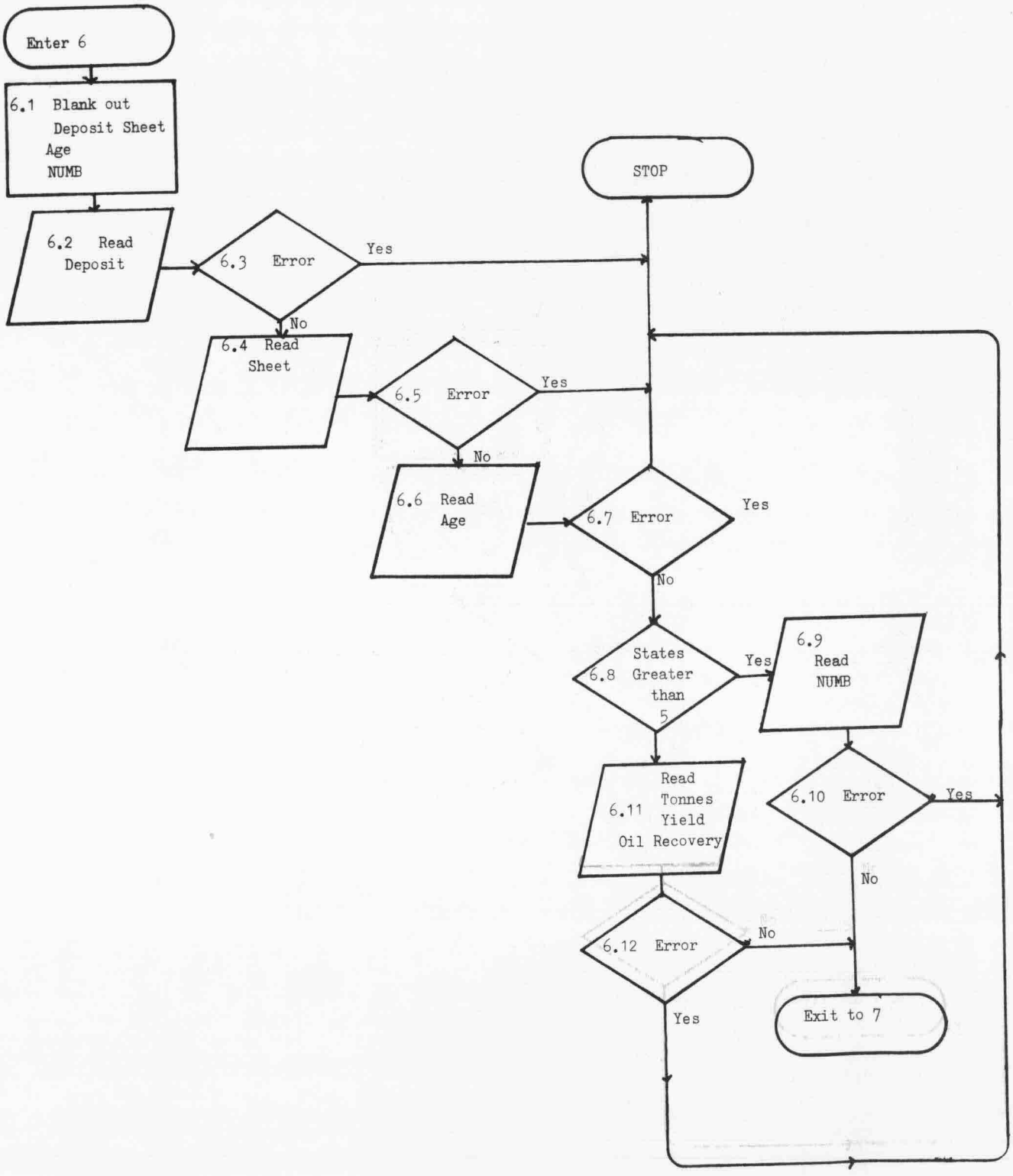
Level 2

5. Anymore Deposits



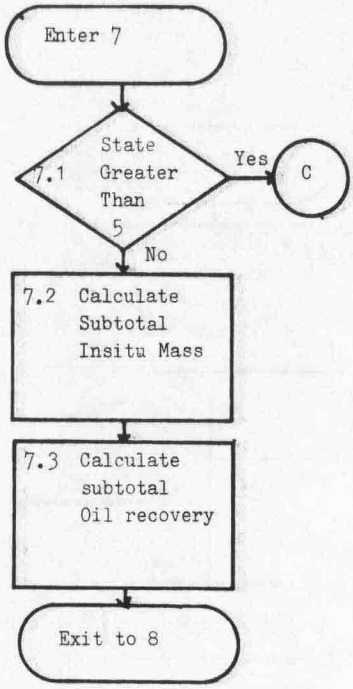
Level 2

6. Read Input Data

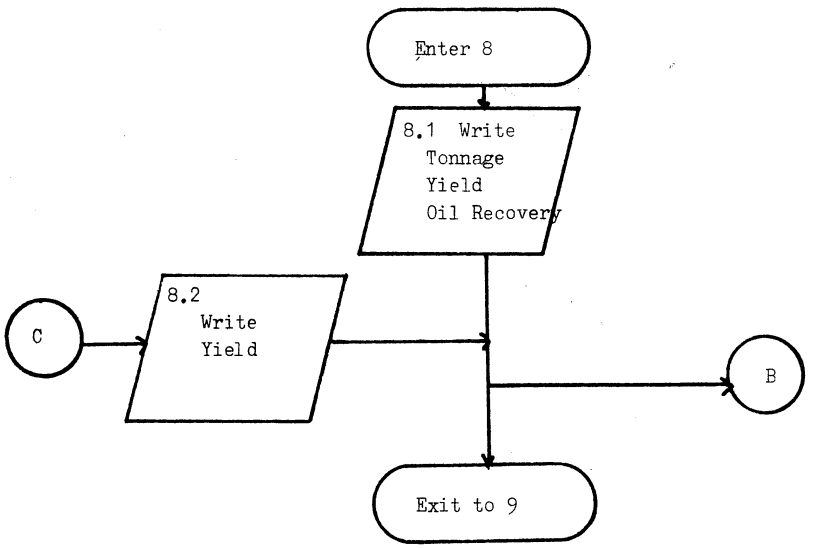


Level 2

7. Calculate State Totals

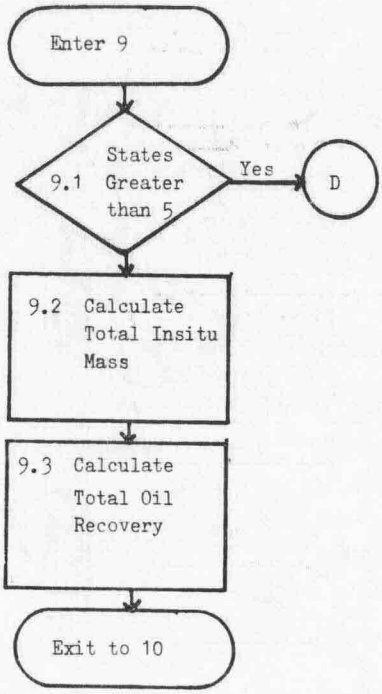


8. Write Resources



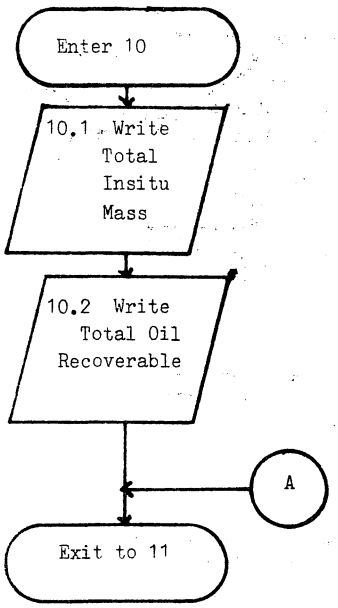
Level 2

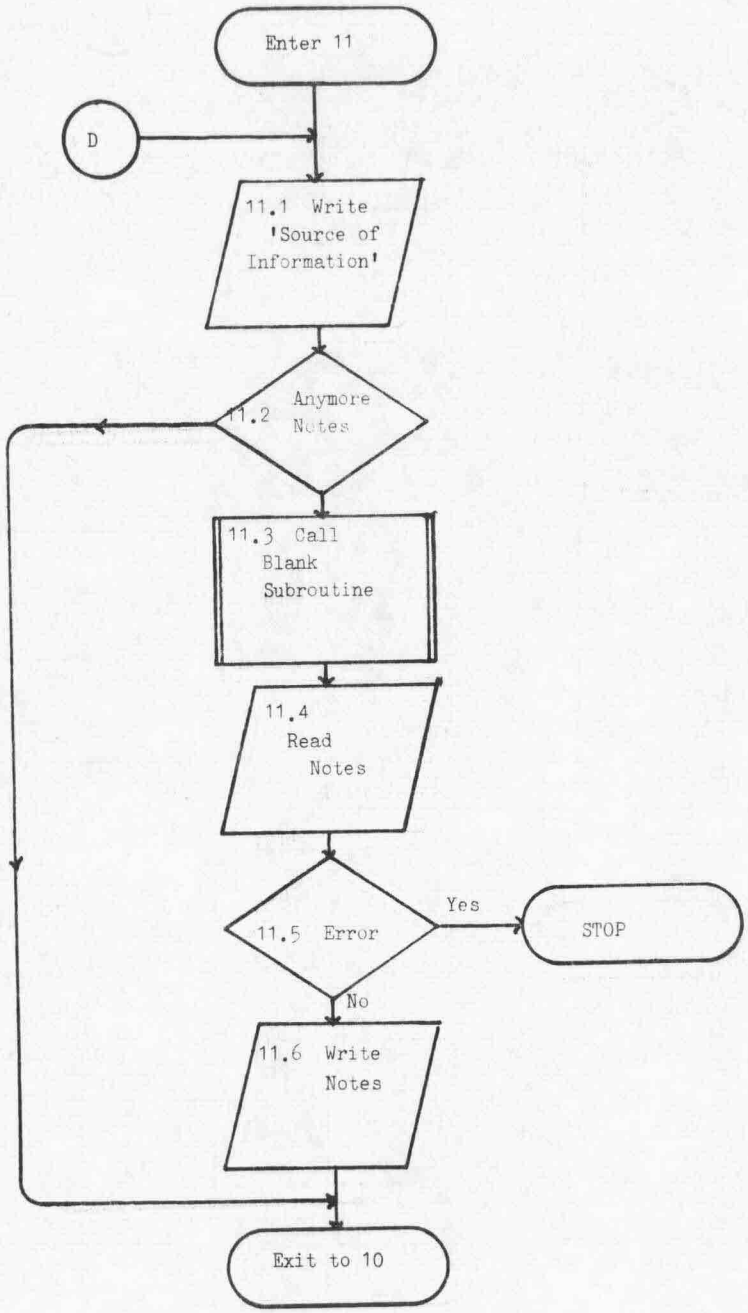
9. Calculate Australian Totals



Level 2

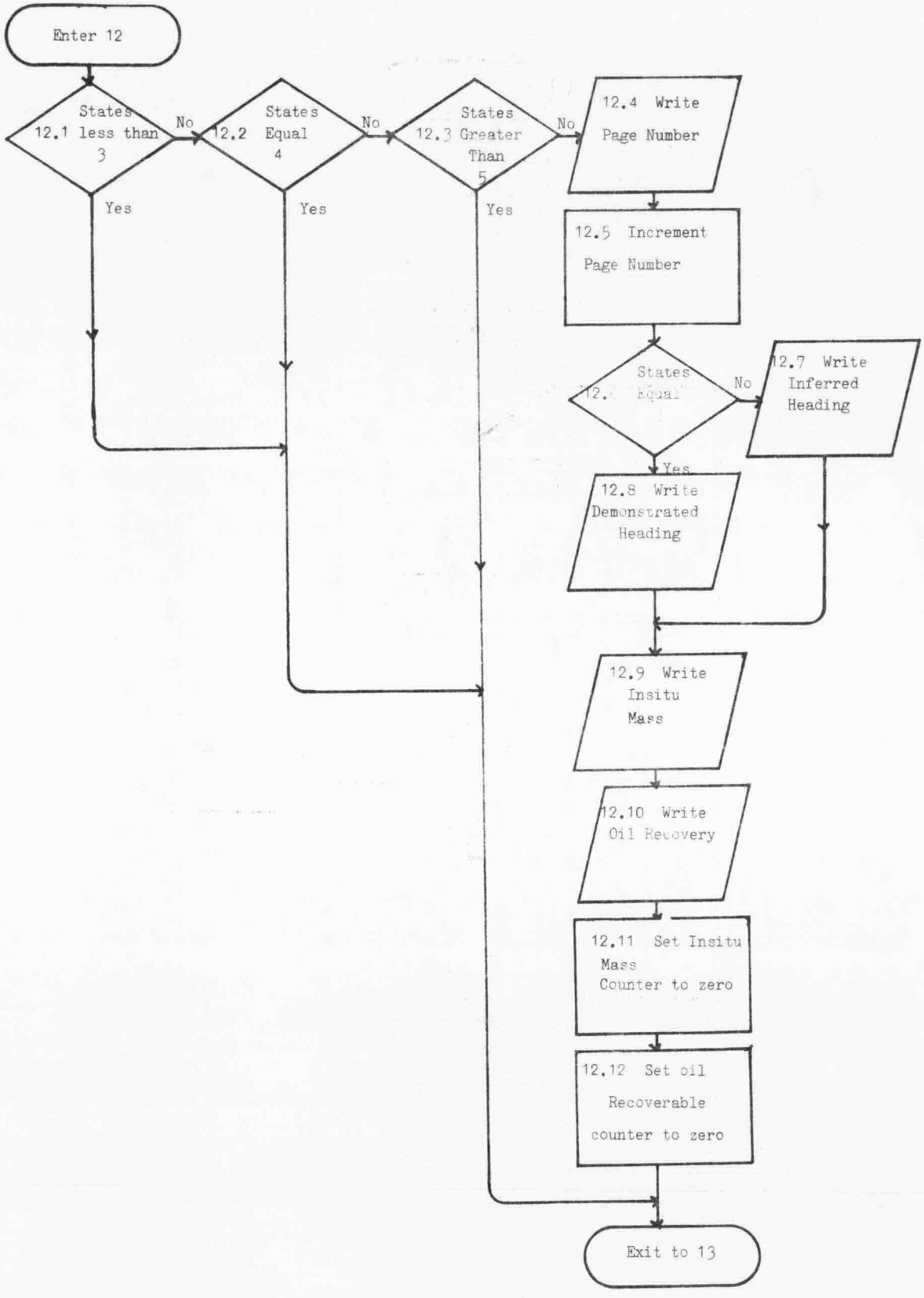
10. Write State Totals



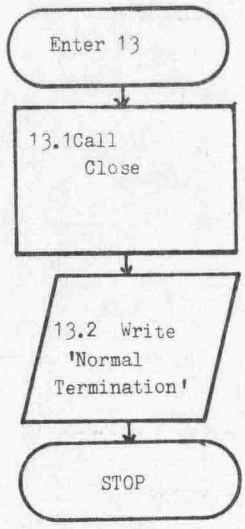

Enter 11
D
11.1 Write 'Source of Information'
11.2 Anymore Notes
11.3 Call Blank Subroutine
11.4 Read Notes
11.5 Error
Yes
STOP
No
11.6 Write Notes
Exit to 10

Level 2

12. Write Australian Totals

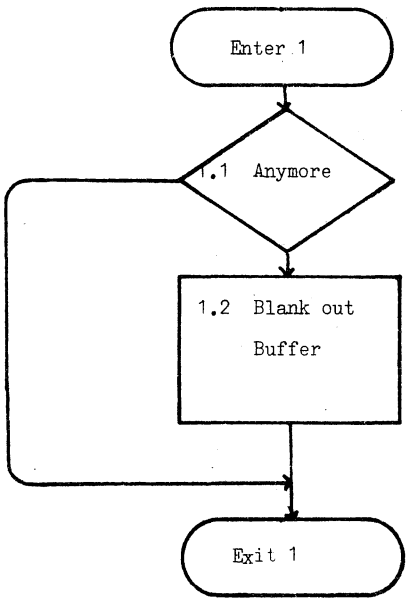


13. Call Close



Level 3

1. Subroutine Blank



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APPENDIXES 2, 3, and 4

Appendix 2 : Listing of OYSHL in Fortran

Appendix 3 : Data file 'SHALIE'

Appendix 4 : Output

Appendix 2

Listing of OYSHL in fortran

```
0001          FTN4,B
0002          PROGRAM OYSHL
0003 C
0004 C        DOCUMENT UNTO OTHERS AS YOU WOULD BE DOCUMENTED TO
0005 C                  PREPARED BY IAN DONALD DEC 1980
0006 C        THIS PROGRAM IS DESIGNED TO CALCULATE AND TABULATE
0007 C           DEMONSTRATED, INFERRED AND OTHER OIL SHALE RESOURCES IN AUSTRALIA
0008 C
0009 C        THE DATA FILE FOR THIS PROGRAM IS CALLED SHALIE
0010 C
0011          DIMENSION IDCB(144),NAME(3),IBUF(40),STATE(10),DEPOST(10),
0012         AAGE(5),NOTES(40),SHEET(10),IP(5),NUMB(5),DATE(5)
0013          INTEGER STATE,DEPOST,SHEET,AGE,NOTES,NUMB,DATE
0014          REAL TONNS,YIELD,RESCM,STONN,SRESC,NTOTT,STOTT
0015 C
0016 C
0017 C                              VARIABLE KEYS
0018 C
0019 C        STATE  - STATE OF AUSTRALIA
0020 C        DEPOST - OIL SHALE PROVINCE NAME
0021 C        SHEET  - GEOLOGICAL MAP REFERENCE
0022 C        AGE    - GEOLOGICAL AGE OF THE OIL SHALE
0023 C        COMMT  - SOURCE OF THE OIL SHALE RESOURCE FIGURES
0024 C        NOTES  - TITLES TO THE FRONT PAGE
0025 C        TONNS  - TONNAGE OF OIL SHALE
0026 C        YIELD  - AVERAGE AMOUNT OF OIL SHALE EXTRACTED
0027 C        RESCM  - VOLUME OF OIL SHALE EXTRACTED FROM OIL SHALE
0028 C        NSTATE - TOTAL NUMBER OF STATES
0029 C        NDEPST - NUMBER OF OIL SHALE DEPOSITS
0030 C        NUMB   - YIELD FIGURE FOR OTHER DEPOSIT
0031 C        DATE   - DATE OF COMPILATION
0032 C
0033 C                              COUNTING KEYS
0034 C
0035 C        ITABLE - NUMBER OF TABLES
0036 C        IPAGE  - NUMBER OF PAGES
0037 C        NSTATE - NUMBER OF STATES
0038 C        NDEPST - NUMBER OF DEPOSITS
0039 C        STONN  - CUMULATES OIL SHALE TONNAGE FOR EACH STATE
0040 C        SRESC  - CUMULATES TOTAL RECOVERABLE OIL FOR EACH STATE
0041 C        NTOTT  - CUMULATES TOTAL OIL SHALE TONNAGE FOR AUSTRALIA
0042 C        STOTT  - CUMULATES RECOVERABLE OIL SHALE FOR AUSTRALIA
0043 C
0044 C        GET PARAMETERS SET DEFAULT TERMINAL TO SYSTEM CONSOLE     (1)
0045 C
0046          CALL RMPAR (IP)
0047          LUN = 1
0048          IF (IP(1).GT.0) LUN = IP (1)
0049 C
0050 C        ASK NAME OF INPUT FILE     (1)
0051 C
0052          NAME (2) = 2H
0053          NAME (3) = 2H
0054          WRITE (LUN,100)
0055   100    FORMAT (//,"ENTER NAME OF FILE ")
0056          READ (LUN,200)  (NAME(I),I = 1,3)
0057   200    FORMAT (3A2)
0058          ITABLE = 1
0059          IPAGE = 1
```

```
0060         ISC    = 900
0061         ICR    = 9
0062 C
0063 C        OPEN THE FILE     (1)
0064 C
0065         CALL OPEN (IDCB,IERR,NAME,0,ISC,ICR)
0066         IF (IERR.GE.0) GO TO 400
0067 C
0068 C       IF IERR IS NEGATIVE AN ERROR HAS OCCURRED
0069 C
0070         WRITE (LUN,300) IERR
0071   300   FORMAT (/,"ERROR",I4,"ON OPEN")
0072         STOP
0073 C
0074 C        BLANK OUT BUFFER     (2)
0075 C
0076   400   DO 25 I = 1,5
0077         DATE (I) = 2H
0078    25   CONTINUE
0079 C
0080 C        READ AND WRITE OUT INTRODUCTION TO THE REPORT     (2)
0081 C
0082         CALL READF (IDCB,IERR,DATE,5,LEN)
0083         IF (IERR.LT.0) GO TO 999
0084         DO 500 I = 1,69
0085         CALL BLANK (IBUF)
0086         CALL READF (IDCB,IERR,IBUF,40,LEN)
0087         IF (IERR.LT.0) GO TO 999
0088         CALL CODE
0089         READ (IBUF,7) (NOTES (J), J = 1,40)
0090       7 FORMAT (40A2)
0091         IF (I.EQ.4) WRITE (6,415) DATE
0092   415   FORMAT (43X,5A2)
0093         IF (I.EQ.9.OR.I.EQ.28.OR.I.EQ.50) WRITE (6,410)
0094   410   FORMAT (1H1,6/)
0095   420   WRITE (6,430) (NOTES (J), J = 1,40)
0096   430   FORMAT (10X,40A2,/)
0097   500   CONTINUE
0098 C
0099 C        READ NUMBER OF STATES     (3)
0100 C
0101         CALL BLANK (IBUF)
0102   510   CALL READF (IDCB,IERR,IBUF,10,LEN)
0103         IF (IERR.LT.0) GO TO 999
0104         CALL CODE
0105         READ (IBUF,*) NSTATE
0106 C
0107 C        SET TOTAL COUNTERS TO ZERO     (3)
0108 C
0109   515   NTOTT = 0.0
0110         STOTT = 0.0
0111 C
0112 C        COUNT NUMBER OF STATES     (3)
0113 C
0114   520   DO 1000 NS=1, NSTATE
0115 C
0116 C        BLANK OUT BUFFER     (3)
0117 C
0118         DO 8 I = 1,10
0119         STATE (I) = 2H
```

```
0120      8 CONTINUE
0121 C
0122 C       SET SUB-TOTAL COUNTERS TO ZERO    (3)
0123 C
0124        STONN = 0.0
0125        SRESC = 0.0
0126 C
0127 C       WRITE TABLE AND PAGE NUMBERS    (4)
0128 C
0129    530 WRITE (6,540) ITABLE,IPAGE
0130    540 FORMAT (1H1,5X,"TABLE",I3,105X,"PAGE",I3,/)
0131        ITABLE = ITABLE + 1
0132        IPAGE = IPAGE + 1
0133 C
0134 C       WRITE HEADINGS TO THE PRINTER    (4)
0135 C
0136        IF (NS.GT.5) GO TO 625
0137        IF (NS.GT.3) GO TO 615
0138   600  WRITE (6,610)
0139   610  FORMAT (40X,"SUMMARY OF DEMONSTRATED OIL SHALE RESOURCES")
0140        GO TO 650
0141   615  WRITE (6,620)
0142   620  FORMAT (40X,"SUMMARY OF INFERRED OIL SHALE RESOURCES")
0143        GO TO 650
0144   625  WRITE (6,630)
0145   630  FORMAT (40X,"SUMMARY OF OTHER OIL SHALE DEPOSITS")
0146   650  CALL READF (IDCB,IERR,STATE,10,LEN)
0147        IF (IERR.LT.0) GO TO 999
0148   700  WRITE (6,701) STATE,DATE
0149   701  FORMAT (50X,"IN",2X,10A2,2X,"AS AT",2X,5A2)
0150        IF (NS.GT.5) GO TO 703
0151        GO TO 710
0152   703  WRITE (6,705)
0153   705  FORMAT(/,4X,"DEPOSIT",15X,"1:250000",15X,"AGE",23X,"YIELD")
0154        GO TO 722
0155   710  WRITE (6,720)
0156   720  FORMAT (/,4X,"DEPOSIT",15X,"1:250000",15X,"AGE",
0157       B10X,"IN SITU MASS",13X,"YIELD",13X,"RECOVERABLE")
0158        GO TO 730
0159   722  IF (NS.GT.5) WRITE (6,725)
0160   725  FORMAT (26X,"SHEET")
0161        GO TO 749
0162   730  WRITE (6,740)
0163   740  FORMAT (26X,"SHEET",73X,"OIL")
0164   745  WRITE (6,747)
0165   747  FORMAT (60X,"(million tonnes)",7X,"(litres/tonnes)",
0166       C5X,"(million cubic metres)")
0167 C
0168 C       READ NUMBER OF DEPOSITS AND NUMBER OF COMMENTS    (5)
0169 C
0170   749  CALL BLANK (IBUF)
0171        CALL READF (IDCB,IERR,IBUF,10,LEN)
0172        IF (IERR.LT.0) GO TO 999
0173        CALL CODE
0174        READ (IBUF,*) NDEPST,NNOTES
0175 C
0176 C       COUNT THE NUMBER OF DEPOSITS    (5)
0177 C
0178   750  DO 2000 ND=1, NDEPST
0179 C
```

```
0180 C       BLANK OUT BUFFER     (5)
0181 C
0182         DO 9 I = 1,10
0183         DEPOST (I) = 2H
0184         SHEET (I) = 2H
0185       9 CONTINUE
0186         DO 15 I = 1,5
0187         AGE (I) = 2H
0188         NUMB (I) = 2H
0189    15   CONTINUE
0190 C
0191 C       READ THE INPUT DATA     (6)
0192 C
0193         CALL READF (IDCB,IERR,DEPOST,10,LEN)
0194         IF (IERR.LT.0) GO TO 999
0195         CALL READF (IDCB,IERR,SHEET,10,LEN)
0196         IF (IERR.LT.0) GO TO 999
0197         CALL READF (IDCB,IERR,AGE,5,LEN)
0198         IF (IERR.LT.0) GO TO 999
0199         IF (NS.GT.5) GO TO 805
0200         CALL BLANK (IBUF)
0201         CALL READF (IDCB,IERR,IBUF,40,LEN)
0202         IF (IERR.LT.0) GO TO 999
0203   800   CALL CODE
0204         READ (IBUF,*) TONNS,YIELD,RESCM
0205         IF (IERR.LT.0) GO TO 999
0206         GO TO 809
0207   805   CALL READF (IDCB,IERR,NUMB,10,LEN)
0208         IF (IERR.LT.0) GO TO 999
0209 C
0210 C       CALCULATE THE STATE TOTALS     (7)
0211 C
0212         IF (NS.GT.5) GO TO 820
0213   809   STONN = TONNS + STONN
0214         SRESC = RESCM + SRESC
0215 C
0216 C       WRITE OUT RESOURCES     (8)
0217 C
0218         WRITE (6,810) DEPOST,SHEET,AGE,TONNS,YIELD,RESCM
0219   810   FORMAT (2(2X,10A2),2X,5A2,5X,F10.1,10X,F10.1,10X,F10.1)
0220         GO TO 2000
0221   820   WRITE (6,825) DEPOST,SHEET,AGE,NUMB
0222   825   FORMAT (2(2X,10A2),2X,5A2,18X,5A2)
0223 C
0224 C       ANYMORE DEPOSITS
0225 C
0226   2000  CONTINUE
0227 C
0228 C       CALCULATE AUSTRALIA'S TOTALS     (9)
0229 C
0230         IF (NS.GT.5) GO TO 912
0231         NTOTT = STONN + NTOTT
0232         STOTT = SRESC + STOTT
0233 C
0234 C       WRITE  THE STATE TOTALS    (10)
0235 C
0236         WRITE (6,910) STONN,SRESC
0237   910   FORMAT (/,4X,"TOTAL",52X,F10.1,30X,F10.1)
0238 C
0239 C       READ AND WRITE NOTES FOR EACH STATE     (11)
```

```
0240 C
0241   912   WRITE (6,914)
0242   914   FORMAT (/,6X,"SOURCE OF INFORMATION")
0243         DO 3000 NN=1,NNOTES
0244         CALL BLANK (IBUF)
0245         CALL READF (IDCB,IERR,IBUF,40,LEN)
0246         IF (IERR.LT.0) GO TO 999
0247         CALL CODE
0248         READ (IBUF,10) (NOTES (J), J = 1,40)
0249      10 FORMAT (40A2)
0250         WRITE (6,920) (NOTES (J), J = 1,40)
0251   920   FORMAT (10X,40A2)
0252   3000  CONTINUE
0253 C
0254 C        WRITE AUSTRALIA'S TOTALS    (12)
0255 C
0256         IF (NS.LT.3) GO TO 1000
0257         IF (NS.EQ.4) GO TO 1000
0258         IF (NS.GT.5) GO TO 1000
0259   925   WRITE (6,927) IPAGE
0260   927   FORMAT (1H1,118X,"PAGE",I3,/)
0261         IPAGE = IPAGE + 1
0262         IF (NS.NE.3) GO TO 940
0263   930   WRITE (6,935)
0264   935   FORMAT (20/,40X,"SUMMARY OF DEMONSTRATED OIL SHALE RESOURCES")
0265         GO TO 950
0266   940   WRITE (6,945)
0267   945   FORMAT (20/,40X,"SUMMARY OF INFERRED OIL SHALE RESOURCES")
0268   950   WRITE (6,955) DATE
0269   955   FORMAT (50X,"IN AUSTRALIA",2X,"AS AT",2X,5A2)
0270   960   WRITE (6,965) NTOTT
0271   965   FORMAT (/,20X,"THE TOTAL RESOURCES OF OIL SHALE ARE",
0272        D2X,F10.1,2X,"Million tonnes")
0273   970   WRITE (6,975) STOTT
0274   975   FORMAT(/,20X,"TOTAL RECOVERABLE OIL AT FISCHER ASSAY YIELD IS",
0275        E2X,F10.1,2X,"Million cubic metres")
0276 C
0277 C        SET TOTAL COUNTERS TO ZERO     (12)
0278 C
0279         NTOTT = 0.0
0280         STOTT = 0.0
0281 C
0282 C        ANYMORE STATES
0283 C
0284   1000  CONTINUE
0285 C
0286 C        ALL DONE WRAP UP      (13)
0287 C
0288   999   CALL CLOSE
0289         WRITE (LUN,9999)
0290   9999  FORMAT (/,"NORMAL TERMINATION")
0291         STOP
0292         END
0293 C
0294 C     SUBROUTINE BLANK (IBUF)
0295 C
0296         SUBROUTINE BLANK (IBUF)
0297         DIMENSION IBUF (40)
0298         DO 101 I = 1,40
0299   101   IBUF (I) = 2H
```

```
0300          RETURN
0301          END
0302          END$
```

Appendix 3

Data file 'SEALIE'

0001 30-09-1980

SUMMARY OF AUSTRALIA'S OIL SHALE RESOURCES

AS AT

COMPILED BY THE
BUREAU OF MINERAL RESOURCES
DEPARTMENT OF NATIONAL DEVELOPMENT AND ENERGY

CONTENTS

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6	Assistant Director Mineral Resources, BMR
7	Assistant Director P.E.B., BMR
8	Chief Petroleum Technologist
9	Assistant Chief Petroleum Exploration
10	Oil Shale Commodities Officer (D. Gibson)
11	Senior Technical Officer, Petroleum Technology Section

DEFINITIONS

RESOURCE: A body of naturally occurring oil shale in or on the Earth's crust in such a form that economic exploitation is currently or potentially feasible. (Aus.Min.Ind.Quarterly Review,Vol.28,No.1,pp11-13)

DEMONSTRATED RESOURCES: A collective term for the sum of measured and indicated resources as defined in the BMR system of resource classification.(Aus.Min.Ind. Quarterly Review,Vol.28,No.1,pp11-13)

0060
0061 INFERRED RESOURCES: Resources for which quantitative estimates are based
0062 largely on broad knowledge of the geological character of the deposit and
0063 for which there are few, if any, samples or measurements. These figures
0064 may be subject to major revisions as more geological and geophysical data
0065 become available. (Aus.Min.Ind. Quarterly Review,Vol.28,No.1,pp11-13)
0066
0067 YIELD: The volume of oil recoverable from oil shale using Fischer assay.
0068 It is expressed in litres/tonne of oil shale at in situ moisture conditions.
0069
0070 1:250000 SHEET: Geological 1:250000 scale map name.
0071 9
0072 QUEENSLAND
0073 7,11
0074 Alpha (1,2,3)
0075 Tambo
0076 Permian
0077 2.0,408.0,0.8
0078 Alpha (1,2,3)
0079 Tambo
0080 Permian
0081 3.3,142.0,0.5
0082 Condor (4)
0083 Proserpine
0084 Tertiary
0085 17849.0,55.7,993.7
0086 Julia Creek (5)
0087 Julia Creek
0088 Cretaceous
0089 4000.0,60.0,238.5
0090 Rundle (6)
0091 Rockhampton
0092 Tertiary
0093 4678.0,77.3,361.5
0094 Stuart (4)
0095 Rockhampton
0096 Tertiary
0097 5000.0,70.0,318.0
0098 Yaamba (7,8)
0099 Rockhampton
0100 Tertiary
0101 1675.0,57.2,95.7
0102 (1) Connah,T.H., 1964 - Torbanite deposit - Alpha, Central Queensland
0103 Geological Survey of Queensland Report 3.
0104 (2) Swarbrick,C.F.J., 1974 - Oil Shale resources of Queensland
0105 Geological Survey of Queensland Report 83.
0106 (3) Oil recoverable and yield calculated by BMR
0107 (4) Southern Pacific Petroleum Quarterly Report 30-06-1980.
0108 (5) Miner Newspaper June 9-22 1980.
0109 (6) Southern Pacific Petroleum Quarterly Report 31-12-1980.
0110 (7) Peabody Australia Summary of Yaamba Oil Shale Project,
0111 Project Report 1-07-1980.
0112 (8) Yield calculated by BMR.
0113 NEW SOUTH WALES
0114 2,3
0115 Baerami (1,2)
0116 Singleton
0117 Permian
0118 10.8,258.0,2.8
0119 NewnesGlen Davis(1,2)

0120 Sydney
0121 Permian
0122 9.0,420.0,3.8
0123 (1) Lishmund, S.R., 1974 - Oil Shale, Geological Survey
0124 of New South Wales, Mineral Industry No. 30.
0125 (2) Oil recoverable calculated by BMR.
0126 TASMANIA
0127 5,3
0128 Beulah (1)
0129 Burnie
0130 Permian
0131 2.4,120.8,0.3
0132 Chudliegh (1)
0133 Burnie/Launceston
0134 Permian
0135 6.1,120.8,0.7
0136 Latrobe-Kimberley(1)
0137 Burnie/Launceston
0138 Permian
0139 18.2,120.8,2.2
0140 Nook (1)
0141 Burnie
0142 Permian
0143 1.1,120.8,0.1
0144 Quamby Bluff (1)
0145 Launceston
0146 Permian
0147 3.8,120.8,0.5
0148 (1) Jennings,I.B., Noldart, A.J. and Williams,E., 1967 -
0149 Geology and mineral resources of Tasmania.
0150 Tasmanian Geological Survey Bulletin 50.
0151 QUEENSLAND
0152 2,3
0153 Toolebuc Fm. (1)
0154 Various
0155 Cretaceous
0156 3838000.0,60.0,230280.0
0157 Duaringa (2,3)
0158 Duaringa
0159 Tertiary
0160 10000.0,60.4,604.0
0161 (1) Calculated by BMR (BMR File 1979/579 folio 96).
0162 (2) Southern Pacific Petroleum confidential report.
0163 (3) Mass figure assumed from recoverable oil by BMR.
0164 NEW SOUTH WALES
0165 2,3
0166 Baerami (1)
0167 Singleton
0168 Permian
0169 5.0,258.0,1.3
0170 NewnesGlen Davis(1,2)
0171 Sydney
0172 Permian
0173 11.0,420.0,4.6
0174 (1) Lishmund,S.R., 1974 - Oil Shale. Geological Survey
0175 of New South Wales. Mineral Industry 30.
0176 (2) Oil recoverable calculated by BMR.
0177 QUEENSLAND
0178 17,6
0179 Bungobine (1)

0180 Mt. Coolon
0181 Tertiary
0182 54-160
0183 Byfield (2)
0184 Port Clinton
0185 Tertiary
0186 54
0187 Camooweal (3,4)
0188 Mt. Isa
0189 Cambrian
0190 67-104
0191 Canungra (4)
0192 Tweed Heads
0193 Jurassic
0194 38
0195 Cape Hillsborough(4)
0196 Proserpine
0197 Tertiary
0198 22-82
0199 Carnarvon Creek(4)
0200 Eddystone
0201 Permian
0202 45-358
0203 Lowmead (4)
0204 Bundaberg
0205 Tertiary
0206 10-168
0207 Mimosa Syncline(4)
0208 Taroom
0209 Jurassic
0210 64
0211 Nagoorin (5)
0212 Monto
0213 Tertiary
0214 61
0215 Oakey-Acland(4)
0216 Ipswick
0217 Jurassic
0218 112-242
0219 Orallo (4)
0220 Roma
0221 Jurassic
0222 200
0223 Plevna (4)
0224 Mackay
0225 Tertiary
0226 67-100
0227 Pluto (5)
0228 Bowen
0229 Tertiary
0230 n/a
0231 Rosella Creek(4)
0232 Bowen?
0233 Permian
0234 n/a
0235 Strathpine (4)
0236 Brisbane
0237 Tertiary
0238 18-228
0239 Ukalunda (4)

0240 Bowen
0241 Tertiary
0242 54
0243 Withcott (4)
0244 Ipswick
0245 Jurassic
0246 22-358
0247 (1) Australian Financial Review 26-09-1980
0248 (2) South Pacific Petroleum Quarterly Report 30-06-1979
0249 (3) BMR drilling and Fischer Assay.
0250 (4) Swarbrick,C.F.J., 1974 - Oil shale resources of Queensland,
0251 Geological Survey of Queensland Report 83.
0252 (5) South Pacific Petroleum Quarterly Report 30-06-1980
0253 NEW SOUTH WALES
0254 21,2
0255 Abermain Colliery(1)
0256 Singleton
0257 Permian
0258 n/a
0259 Barigan (1)
0260 Dubbo
0261 Permian
0262 158-533
0263 Blackmans Crown(1)
0264 Sydney
0265 Permian
0266 n/a
0267 Burragorang(1)
0268 Wollongong
0269 Permian
0270 n/a
0271 Coolaway(1)
0272 Singleton
0273 Permian
0274 697-770
0275 Dunns Mt.(1)
0276 Singleton
0277 Permian
0278 n/a
0279 Genowlan (1)
0280 Sydney
0281 Permian
0282 79-542
0283 Greta (1)
0284 Singleton
0285 Permian
0286 n/a
0287 Grose Valley (1)
0288 Sydney
0289 Permian
0290 n/a
0291 Hartly Vale (1)
0292 Sydney
0293 Permian
0294 226-678
0295 Ilford Range (1)
0296 Dubbo
0297 Permian
0298 n/a
0299 Joadja (1)

0300 Wollongong
0301 Permian
0302 590
0303 Marangaroo (1)
0304 Sydney
0305 Permian
0306 271-1072
0307 Mornington (1)
0308 Dubbo
0309 Permian
0310 n/a
0311 Mt. Kembla (1)
0312 Wollongong
0313 Permian
0314 271
0315 Mt. Victoria (1)
0316 Sydney
0317 Permian
0318 n/a
0319 Murrurundi (1)
0320 Tamworth
0321 Permian
0322 n/a
0323 Narrow Neck (1)
0324 Sydney
0325 Permian
0326 n/a
0327 Tongbong Mt. (1)
0328 Dubbo
0329 Permian
0330 n/a
0331 Ulan (1)
0332 Dubbo
0333 Permian
0334 n/a
0335 Wollar (1)
0336 Dubbo
0337 Permian
0338 n/a
0339 (1) Lishmund,S.R., 1974 - Oil shale. Geological Survey of
0340 New South Wales Mineral Industry 30.
0341 TASMANIA
0342 2,2
0343 Preolenna (1)
0344 Burnie
0345 Permian
0346 n/a
0347 Barn Bluff-Mt.Pelion(1)
0348 Burnie/Queenstown
0349 Permian
0350 n/a
0351 (1) Jennings,I.B.,Noldart,A.J.and Williams,E., 1977 - Geology and mineral
0352 resources of Tasmania. Tasmanian Geological Survey Bulletin 50.
0353 WESTERN AUSTRALIA
0354 1,1
0355 Coolgardie (1)
0356 Kalgoorlie
0357 Tertiary
0358 135
0359 (1) Report of the Mines Department of Western Australia for 1904, p93-94.

Appendix 4

Output

SUMMARY OF AUSTRALIA'S OIL SHALE RESOURCES

AS AT

30-09-1980

COMPILED BY THE

BUREAU OF MINERAL RESOURCES

DEPARTMENT OF NATIONAL DEVELOPMENT AND ENERGY

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9 Assistant Chief Petroleum Exploration

10 Oil Shale Commodities Officer (D. Gibson)

11 Senior Technical Officer, Petroleum Technology Section

DEFINITIONS

RESOURCE: A body of naturally occurring oil shale in or on the Earth's crust in such a form that economic exploitation is currently or potentially feasible. (Aus.Min.Ind.Quarterly Review,Vol.28,No.1,pp11-13)

DEMONSTRATED RESOURCES: A collective term for the sum of measured and indicated resources as defined in the BMR system of resource classification.(Aus.Min.Ind. Quarterly Review,Vol.28,No.1,pp11-13)

INFERRED RESOURCES: Resources for which quantitative estimates are based largely on broad knowledge of the geological character of the deposit and for which there are few, if any, samples or measurements. These figures may be subject to major revisions as more geological and geophysical data become available. (Aus.Min.Ind. Quarterly Review,Vol.28,No.1,pp11-13)

YIELD: The volume of oil recoverable from oil shale using Fischer assay. It is expressed in litres/tonne of oil shale at in situ moisture conditions.

1:250000 SHEET: Geological 1:250000 scale map name.

TABLE 1

SUMMARY OF DEMONSTRATED OIL SHALE RESOURCES IN QUEENSLAND AS AT 30-09-1980

DEPOSIT	1:250000 SHEET	AGE	IN SITU MASS (million tonnes)	YIELD (litres/tonnes)	RECOVERABLE OIL (million cubic metres)
Alpha (1,2,3)	Tambo	Permian	2.0	408.0	.8
Alpha (1,2,3)	Tambo	Permian	3.3	142.0	.5
Condor (4)	Proserpine	Tertiary	17849.0	55.7	993.7
Julia Creek (5)	Julia Creek	Cretaceous	4000.0	60.0	238.5
Rundle (6)	Rockhampton	Tertiary	4678.0	77.3	361.5
Stuart (4)	Rockhampton	Tertiary	5000.0	70.0	318.0
Yaamba (7,8)	Rockhampton	Tertiary	1675.0	57.2	95.7
TOTAL			33207.3		2008.7

SOURCE OF INFORMATION

(1) Connah,T.H., 1964 - Torbanite deposit - Alpha, Central Queensland Geological Survey of Queensland Report 3.
(2) Swarbrick,C.F.J., 1974 - Oil Shale resources of Queensland Geological Survey of Queensland Report 83.
(3) Oil recoverable and yield calculated by BMR
(4) Southern Pacific Petroleum Quarterly Report 30-06-1980.
(5) Miner Newspaper June 9-22 1980.
(6) Southern Pacific Petroleum Quarterly Report 31-12-1980.
(7) Peabody Australia Summary of Yaamba Oil Shale Project, Project Report 1-07-1980.
(8) Yield calculated by BMR.

SUMMARY OF DEMONSTRATED OIL SHALE RESOURCES IN NEW SOUTH WALES AS AT 30-09-1980

DEPOSIT	1:250000 SHEET	AGE	IN SITU MASS (million tonnes)	YIELD (litres/tonnes)	RECOVERABLE OIL (million cubic metres)
Baerami (1,2)	Singleton	Permian	10.8	258.0	2.8
NewnesGlen Davis(1,2	Sydney	Permian	9.0	420.0	3.8
TOTAL			19.8		6.6

SOURCE OF INFORMATION

(1) Lishmund, S.R., 1974 - Oil Shale, Geological Survey of New South Wales, Mineral Industry No. 30.

(2) Oil recoverable calculated by BMR.

SUMMARY OF DEMONSTRATED OIL SHALE RESOURCES IN TASMANIA AS AT 30-09-1960

DEPOSIT	1:250000 SHEET	AGE	IN SITU MASS (million tonnes)	YIELD (litres/tonnes)	RECOVERABLE OIL (million cubic metres)
Beulah (1)	Burnie	Permian	2.4	120.8	.3
Chudliegh (1)	Burnie/Launceston	Permian	6.1	120.8	.7
Latrobe-Kimberley(1)	Burnie/Launceston	Permian	18.2	120.8	2.2
Nook (1)	Burnie	Permian	1.1	120.8	.1
Quamby Bluff (1)	Launceston	Permian	3.8	120.8	.5
TOTAL			31.6		3.8

SOURCE OF INFORMATION

(1) Jennings,I.B., Noldart, A.J. and Williams,E., 1967 - Geology and mineral resources of Tasmania. Tasmanian Geological Survey Bulletin 50.

SUMMARY OF DEMONSTRATED OIL SHALE RESOURCES
IN AUSTRALIA AS AT 30-09-1980

THE TOTAL RESOURCES OF OIL SHALE ARE 33258.7 Million tonnes

TOTAL RECOVERABLE OIL AT FISCHER ASSAY YIELD IS 2019.1 Million cubic metres

TABLE 4

SUMMARY OF INFERRED OIL SHALE RESOURCES
IN QUEENSLAND AS AT 30-09-1980

DEPOSIT	1:250000 SHEET	AGE	IN SITU MASS (million tonnes)	YIELD (litres/tonnes)	RECOVERABLE OIL (million cubic metres)
Toolebuc Fm. (1)	Various	Cretaceous	3838000.0	60.0	230280.0
Duaringa (2,3)	Duaringa	Tertiary	10000.0	60.4	604.0
TOTAL			3848000.0		230884.0

SOURCE OF INFORMATION

(1) Calculated by BMR (BMR File 1979/579 folio 96).
(2) Southern Pacific Petroleum confidential report.
(3) Mass figure assumed from recoverable oil by BMR.

TABLE 5

SUMMARY OF INFERRED OIL SHALE RESOURCES
IN NEW SOUTH WALES AS AT 30-09-1980

DEPOSIT	1:250000 SHEET	AGE	IN SITU MASS (million tonnes)	YIELD (litres/tonnes)	RECOVERABLE OIL (million cubic metres)
Baerami (1)	Singleton	Permian	5.0	258.0	1.3
NewnesGlen Davis(1,2	Sydney	Permian	11.0	420.0	4.6
TOTAL			16.0		5.9

SOURCE OF INFORMATION

(1) Lishmund,S.R., 1974 - Oil Shale. Geological Survey of New South Wales. Mineral Industry 30.

(2) Oil recoverable calculated by BMR.

SUMMARY OF INFERRED OIL SHALE RESOURCES
IN AUSTRALIA AS AT 30-09-1980

THE TOTAL RESOURCES OF OIL SHALE ARE 3848016.0 Million tonnes

TOTAL RECOVERABLE OIL AT FISCHER ASSAY YIELD IS 230889.9 Million cubic metres

TABLE 6

SUMMARY OF OTHER OIL SHALE DEPOSITS IN QUEENSLAND AS AT 30-09-1980

DEPOSIT	1:250000 SHEET	AGE	YIELD
Bungobine (1)	Mt. Coolon	Tertiary	54-160
Byfield (2)	Port Clinton	Tertiary	54
Camooweal (3,4)	Mt. Isa	Cambrian	67-104
Canungra (4)	Tweed Heads	Jurassic	38
Cape Hillsborough(4)	Proserpine	Tertiary	22-82
Carnarvon Creek(4)	Eddystone	Permian	45-358
Lowmead (4)	Bundaberg	Tertiary	10-168
Mimosa Syncline(4)	Taroom	Jurassic	64
Nagoorin (5)	Monto	Tertiary	61
Oakey-Acland(4)	Ipswick	Jurassic	112-242
Orallo (4)	Roma	Jurassic	200
Plevna (4)	Mackay	Tertiary	67-100
Pluto (5)	Bowen	Tertiary	n/a
Rosella Creek(4)	Bowen?	Permian	n/a
Strathpine (4)	Brisbane	Tertiary	18-228
Ukalunda (4)	Bowen	Tertiary	54
Withcott (4)	Ipswick	Jurassic	22-358

SOURCE OF INFORMATION

(1) Australian Financial Review 26-09-1980
(2) South Pacific Petroleum Quarterly Report 30-06-1979
(3) BMR drilling and Fischer Assay.
(4) Swarbrick,C.F.J., 1974 - Oil shale resources of Queensland, Geological Survey of Queensland Report 83.
(5) South Pacific Petroleum Quarterly Report 30-06-1980

TABLE 7

SUMMARY OF OTHER OIL SHALE DEPOSITS
IN NEW SOUTH WALES AS AT 30-09-1980

DEPOSIT	1:250000 SHEET	AGE	YIELD
Abermain Colliery(1)	Singleton	Permian	n/a
Barigan (1)	Dubbo	Permian	158-533
Blackmans Crown(1)	Sydney	Permian	n/a
Burragorang(1)	Wollongong	Permian	n/a
Coolaway(1)	Singleton	Permian	697-770
Dunns Mt.(1)	Singleton	Permian	n/a
Genowlan (1)	Sydney	Permian	79-542
Greta (1)	Singleton	Permian	n/a
Grose Valley (1)	Sydney	Permian	n/a
Hartly Vale (1)	Sydney	Permian	226-678
Ilford Range (1)	Dubbo	Permian	n/a
Joadja (1)	Wollongong	Permian	590
Marangaroo (1)	Sydney	Permian	271-1072
Mornington (1)	Dubbo	Permian	n/a
Mt. Kembla (1)	Wollongong	Permian	271
Mt. Victoria (1)	Sydney	Permian	n/a
Murrurundi (1)	Tamworth	Permian	n/a
Narrow Neck (1)	Sydney	Permian	n/a
Tongbong Mt. (1)	Dubbo	Permian	n/a
Ulan (1)	Dubbo	Permian	n/a
Wollar (1)	Dubbo	Permian	n/a

SOURCE OF INFORMATION

(1) Lishmund,S.R., 1974 - Oil shale. Geological Survey of New South Wales Mineral Industry 30.

SUMMARY OF OTHER OIL SHALE DEPOSITS IN TASMANIA AS AT 30-09-1980

DEPOSIT	1:250000 SHEET	AGE	YIELD
Preolenna (1)	Burnie	Permian	n/a
Barn Bluff-Mt.Pelion	Burnie/Queenstown	Permian	n/a

SOURCE OF INFORMATION

(1) Jennings,I.B.,Noldart,A.J.and Williams,E., 1977 - Geology and mineral resources of Tasmania. Tasmanian Geological Survey Bulletin 50.

TABLE 9

SUMMARY OF OTHER OIL SHALE DEPOSITS
IN WESTERN AUSTRALIA AS AT 30-09-1980

DEPOSIT	1:250000 SHEET	AGE	YIELD
Coolgardie (1)	Kalgoorlie	Tertiary	135

SOURCE OF INFORMATION

(1) Report of the Mines Department of Western Australia for 1984, p93-94.