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1/11

1982/44. The production of ternary diagrams from WBASE data.

E.L. Martin

Abstract

A data file, produced using an enhanced RITEWB program, is used as input to program DELTA, a general purpose program for plotting ternary diagrams using a COMPLOT DP-8 plotter.

INTRODUCTION

WBASE: a recently established data base system for Tasmanian waters (Polya, 1982), can be searched on various criteria using the program SRCHWB, the results of the search being output to the file FNDWB. The original program RITEWB enabled a printout of either a proof sheet or a complete listing of FNDWB data. RITEWB has now been expanded to include the option of a data file output (DELDAT) suitable for input to the general-purpose DELTA program, for plotting ternary diagrams on the COMPLOT DP-8 plotter.

As components not detected during analysis are recorded in WBASE as the negative value of the detection limit, any such values are set to zero on output to DELDAT.

SEQUENCE OF OPERATIONS

(1) Select records required from WBASE by using program SRCHWB.

(2) Run program RITEWB. Select option 3 and sub-option D.

(3) Respond to the screen prompts by selecting the X, Y and Z components from the list displayed (table 1) and enter the appropriate numbers followed by RETURN.

(4) Type PA C6 to clear file activations.

(5) The file DELDAT now contains

  (a) a D record - used to adjust the data output listing to one decimal place (the DELTA default output is 2 decimal places)

  (b) the data used for plotting

  (c) an E record - used to provide a RESTORE command to the plotter on completion of the plot.

  At this stage the DELDAT file contains no plot titling instructions; if these are required refer to the DELTA program guide (Martin, 1981) and edit the file to include any additional information required. Columns 26 and 27 of the plot records in DELDAT are left blank so that the default plot symbol, a dot, is used; if other symbols are required edit the file accordingly.

(6) Switch on the plotter, insert pen, switch to LOCAL and move to appropriate position, switch to REMOTE.

(7) Make the following assignments and activations:

```
BASE = 148
TDAT05
   1        20.2          1.6          16.0   MAKY76        13
   2        63.7         14.0          14.0   MAKY76        26
   3        69.0          6.4           2.6   MAKY76        33
   4        48.6         28.0          60.0   MAKY76        74
   5        28.6          4.5          18.0   MAKY76        98
   6        15.2          4.4          48.0   MAKY76        99
   7        26.7          2.9           1.4   MAKY76       105
   8        24.4          5.4           5.0   MAKY76       108
   9        27.9          6.3           7.5   MAKY76       109
```

Figure 1. *Example of print-out of plot data listing.*

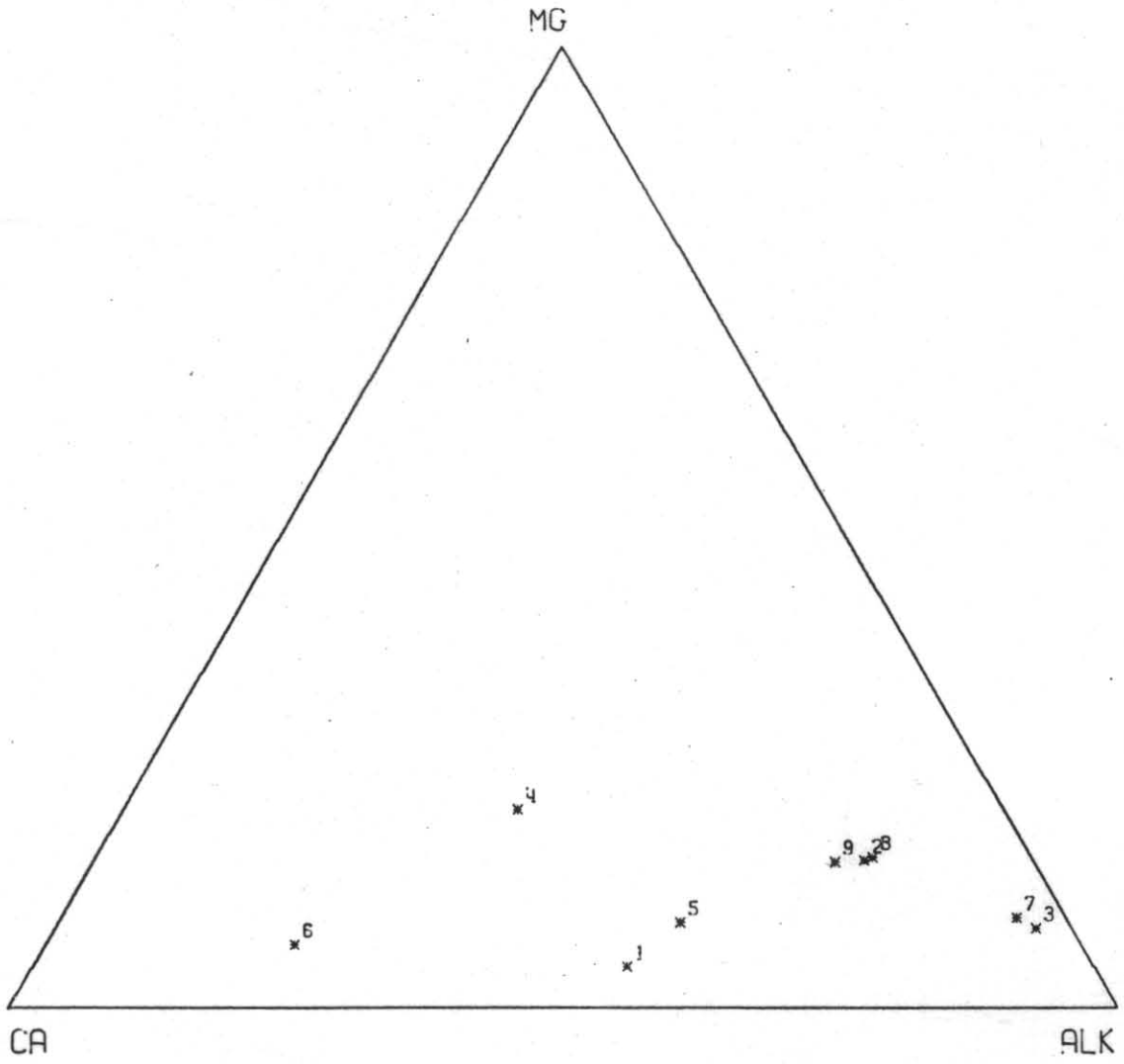

Figure 2. *Example of corresponding plot. Plot symbol 12 has been used and plot points are labelled.*

5 cm

AC DELDAT, 1
AS 0422 (for listing details of plots (fig. 1) on the printer - otherwise AS 0420)
AS 0912 assign plotter (if only a printer listing is required then AS 0900)
RU DELTA

Prompts will ask for offset from right-hand margin of plot paper (mm) and for length of triangle base (mm)

Select the plot point labelling options required. Labels correspond to those on the print-out.

(8) CL to close file.

If another plot is to be made activate the file to logical unit 1 (or rewind - RW 1) and restart the program (ST).

(9) Switch off plotter and restore pen to the case.

Table 1. LIST OF SELECTABLE COMPONENTS FOR DATA OUTPUT

(1)	Conductivity	(9)	Al
(2)	pH	(10)	F
(3)	Na	(11)	SiO_2
(4)	K	(12)	Total carbonate (TCO_3)
(5)	Mg	(13)	Cl
(6)	Ca	(14)	SO_4
(7)	Na + K (Alk.)	(15)	NO_3
(8)	Fe	(16)	Total dissolved solids (TDS)

REFERENCES

MARTIN,E.L. 1981. Guide to the use of the DELTA plotting programs. *Unpubl.Rep.Dep.Mines Tasm.* 1981/35.

POLYA,D.A. 1982. WBASE: a data-base system for Tasmanian waters. *Unpubl. Rep.Dep.Mines Tasm.* 1982/40.

[25 November 1982]

APPENDIX 1


```
$TITL WBS3A    24-NOV-82  DATA FILE OUTPUT ADDED BY E. L. MARTIN
$DBUG
C
C SOURCE FILE FOR "RITEWB"
C
C "RITEWB" READS WATER SAMPLE DATA FROM "WB" OR "FNDWB" AS SPECIFIED
C AND OUTPUTS THIS INFORMATION IN READABLE CODE TO THE PRINTER
C
C
C "WB" IS THE MAIN WATER-ANALYSIS DATA-FILE
C "FNDWB" IS A FILE OF RECORDS FOUND BY A SPECIFIED SEARCH AND
C  TRANSFERRED ( USING THE PROGRAMME MODULE "SRCHWB" )
C
C LOGICAL UNIT ASSIGNMENTS:
C 01-WBD1  -STORES MAXNOS, NUMBER OF RECORDS IN "WB"
C 02-WB    -RANDOM ACCESS DATA FILE
C   -FNDWB -RANDOM ACCESS FILE OF FOUND RECORDS
C 03-WBD3  -STORES PMAXNS, NUMBER OF RECORDS IN "WB" BEFORE LAST UPDATE
C 04-PRINTER-OUTPUT
C 05-VDU   -INPUT
C 06-VDU   -PROMPTS
C 07-WBD5  -STORES FMAXNS NUMBER OF RECORDS IN "FNDWB"
C 08-99    -CORE BUFFER
C
C SUBROUTINES: 0
C FORLIB ROUTINES: SYSCOM, POSITN, INFREE, NUMIN
      DOUBLE PRECISION
     *       LTNNOS, REFNOS, REF, TTYPE, QTITLE(97, 2),
     *       TYPEB, TYPED, TYPEL, TYPEP, TYPER, TYPES,
     *       AARL(6), ARLR(6), ARLD(6), ARLT(6), ARLP(6), ARLC(6), ARLE(6),
     *       RRRL(6), RRLL(6), RRLM(6),
     *       RLUSP(6)
      REAL
     *    LOCLTY(4), REGION(4),
     *    OMEGA, EH, PH, TCO3, CL, SO4, SIO2, CA, MG, K, NA, TDS, FE, AL, NO3, F,
     *    MTCO3, MCL, MSO4, MSIO2, MCA, MMG, MK, MNA, MFE, MAL, MNO3, MF,
     *    FLOW, FLOWLS, DHOLE, DWATER, DAT(3)
      INTEGER*2
     *          WBNOS, TYPE, QUADNO, SQUARE, EAST, NORTH,
     *          NROCK, ROCK1, ROCK2, ROCK3, ROCK4, ROCKRL,
     *          CODE1, CODE2, CODE3, ANALRL, LOCRL,
     *          OPTION, START, FINISH, FMAXNS, YES, NO, COUNT,
     *          NREC, RECNOS(50), PSTYLE, FULL, PROOF,
     *          ECOORD, NCOORD, ICHAR(3),
     *          MAXNOS, PMAXNS, RECORD, I, IREC, ALINE(109),
     *          CHARB, CHARL, CHARP, CHARR, CHARS,
     *          CHARD, CHART, CHARC, CHARE, CHARM, BLANK
C
      LOGICAL
     *       IER                              ,
C
      EQUIVALENCE
     *(ALINE(1), LTNNOS), (ALINE(5), REFNOS), (ALINE(9), REF),
     *(ALINE(13), WBNOS), (ALINE(14), TYPE), (ALINE(15), QUADNO),
```

```
     *(ALINE(16),SQUARE),(ALINE(17),EAST),(ALINE(18),NORTH),
     *(ALINE(19),ECOORD),(ALINE(20),NCOORD),
     *(ALINE(21),LOCLTY),(ALINE(29),REGION),
     *(ALINE(37),NROCK),(ALINE(38),ROCK1),(ALINE(39),ROCK2),
     *(ALINE(40),ROCK3),(ALINE(41),ROCK4),(ALINE(42),ROCKRL),
     *(ALINE(43),CODE1),(ALINE(44),CODE2),(ALINE(45),CODE3),
     *(ALINE(46),ANALRL),(ALINE(47),LOCRL),
     *(ALINE(48),PH),(ALINE(50),TCO3),(ALINE(52),CL),
     *(ALINE(54),SO4),(ALINE(56),SIO2),(ALINE(58),CA),(ALINE(60),MG),
     *(ALINE(62),K),(ALINE(64),NA),(ALINE(66),TDS),
     *(ALINE(68),FE),(ALINE(70),AL),(ALINE(72),NO3),(ALINE(74),F),
     *(ALINE(76),OMEGA),(ALINE(78),EH),
     *(ALINE(80),MTCO3),(ALINE(82),MCL),(ALINE(84),MSO4),
     *(ALINE(86),MSIO2),(ALINE(88),MCA),(ALINE(90),MMG),(ALINE(92),MK),
     *(ALINE(94),MNA),(ALINE(96),MFE),(ALINE(98),MAL),(ALINE(100),NO3),
     *(ALINE(102),MF),
     *(ALINE(104),FLOW),(ALINE(106),DHOLE),(ALINE(108),DWATER)
C
      DATA YES,NO/1HY,1HN/
      DATA FULL,PROOF/1HF,1HP/
      DATA CHARB,CHARL,CHARP,CHARR,CHARS/1HB,1HL,1HP,1HR,1HS/
      DATA CHARD,CHART,CHARC,CHARE,CHARM/1HD,1HT,1HC,1HE,1HM/
      DATA BLANK/1H /
      DATA TYPEB,TYPED,TYPEL,TYPEP,TYPER,TYPES/
     *8HBOREHOLE,8HDAM     ,8HLEACHATE,8HRAINFALL,8HRIVER   ,8HSPRING  /
      DATA ((QTITLE(I,J),J=1,2),I=1,54)/
     *8HCURRIE  ,8H        ,8HNARACOOP,8HA       ,8HCURRIE  ,8H        ,
     *8HNARACOOP,8HA       ,8HCURRIE  ,8H        ,8HNARACOOP,8HA       ,
     *8HN. W. FLIN,8HDERS  ,8HN. E. FLIN,8HDERS  ,8HPEARSHAP,8HE       ,
     *8HGRASSY  ,8H        ,8HGREEN IS,8HLAND    ,8HS. E. FLIN,8HDERS  ,
     *8HTHREE HU,8HMMOCK   ,8HCHAPPELL,8H ISLAND ,8HCAPE BAR,8HREN IS. ,
     *8HCAPE GRI,8HM       ,8HHIGHFIEL,8HD       ,8H        ,8H        ,
     *8HBANKS ST,8HRAIT    ,8HWOOLNORT,8HH       ,8HSMITHTON,8H        ,
     *8HTABLE CA,8HPE      ,8HNOLAND B,8HAY      ,8HBOOBYALL,8HA       ,
     *8HEDDYSTON,8HE       ,8HBLUFF PO,8HINT     ,8HTROWUTTA,8H        ,
     *8HBURNIE  ,8H        ,8HDEVONPOR,8HT       ,8HBEACONSF,8HIELD    ,
     *8HPIPERS R,8HIVER    ,8HRINGAROO,8HMA      ,8HBLUE TIE,8HR       ,
     *8HBALFOUR ,8H        ,8HMAGNET  ,8H        ,8HST VALEN,8HTINES   ,
     *8HSHEFFIEL,8HD       ,8HFRANKFOR,8HD       ,8HLAUNCEST,8HTON     ,
     *8HALBERTON,8H        ,8HST HELEN,8HS       ,8HPIEMAN H,8HEAD     ,
     *8HCORINNA ,8H        ,8HMACKINTO,8HSH      ,8HMIDDLESE,8HX       ,
     *8HQUAMBY  ,8H        ,8HLONGFORD,8H        ,8HBEN LOMO,8HND      ,
     *8HST MARYS,8H        ,8HZEEHAN  ,8H        ,8HMURCHISO,8HN       ,
     *8HDU CANE ,8H        ,8HGREAT LA,8HKE      ,8HLAKE RIV,8HER      /
      DATA ((QTITLE(I,J),J=1,2),I=55,97)/
     *8HSNOW HIL,8HL       ,8HBICHENO ,8H        ,8HSTRAHAN ,8H        ,
     *8HLYELL   ,8H        ,8HST CLAIR,8H        ,8HLAKE ECH,8HO       ,
     *8HINTERLAK,8HEN      ,8HTOOMS   ,8H        ,8HSWANSEA ,8H        ,
     *8HMACQUARI,8HE H/BOUR,8HPILLINGE,8HR       ,8HKING WIL,8HLIAM    ,
     *8HOUSE    ,8H        ,8HOATLANDS,8H        ,8HSWANSTON,8H        ,
     *8HSCHOUTEN,8H        ,8HPT HIBBS,8H        ,8HGORDON  ,8H        ,
     *8HHUNTLEY ,8H        ,8HELLENDAL,8HE       ,8HBRIGHTON,8H        ,
     *8HBUCKLAND,8H        ,8HMARIA   ,8H        ,8HMONTGOME,8HRY      ,
     *8HROCKY PO,8HINT     ,8HPEDDER  ,8H        ,8HSTYX    ,8H        ,
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```
     *8HHOBART  ,8H         ,8HSORELL  ,8H         ,8H         ,8H         ,
     *8HDE WITT ,8H         ,8HARTHUR  ,8H         ,8HPICTON   ,8H         ,
     *8HKINGBORO,8HUGH      ,8HTASMAN  ,8H         ,8H         ,8H         ,
     *8HDAVEY   ,8H         ,8HBATHURST,8H         ,8HADAMSON  ,8H         ,
     *8HDOVER   ,8H         ,8H        ,8H         ,8HS.W. CAP,8HE         ,
     *8HS.E. CAP,8HE        /
C
      DATA (ARLR(I),I=1,6)/
     *8HCOMPLETE,8H         ,8H        ,8H         ,8H         ,8H         /
      DATA (ARLD(I),I=1,6)/
     *8HCOMPLETE,8H:SOME MA,8HJOR COMP,8HONENTS <,8HDETECTIO,8HN LIMITS/
      DATA (ARLT(I),I=1,6)/
     *8HCOMPLETE,8H:ANION A,8HND CATIO,8HN TOTAL ,8H DO NOT ,8HMATCH   /
      DATA (ARLP(I),I=1,6)/
     *8HPARTIAL ,8HONLY     ,8H        ,8H         ,8H         ,8H         /
      DATA (ARLC(I),I=1,6)/
     *8HTDS FROM,8HCONDUCTI,8HVITY MEA,8HSUREMENT,8HS ONLY   ,8H         /
      DATA (ARLE(I),I=1,6)/
     *8HTDS ONLY,8H FROM QU,8HALITATIV,8HE ESTIMA,8HTE OF SA,8HLINITY  /
C
      DATA (RRLL(I),I=1,6)/
     *8HDATA FRO,8HM BORE-H,8HOLE LOG ,8HOR GEOLO,8HGIST'S R,8HEPORTetc/
      DATA (RRLM(I),I=1,6)/
     *8HDATA GUE,8HSSED FRO,8HM GEOLOG,8HICAL MAP,8H        ,8H         /
      DATA (RLUSP(I),I=1,6)/
     *8HUNSPECIF,8HIED      ,8H        ,8H         ,8H         ,8H         /
C
      CALL SYSCOM(I,'AS 0422,0520,0620,0899*')
C
   50 WRITE(6,1)
    1 FORMAT(
     *'RITEWB: WRITES OUT WATER-ANALYSIS RECORDS'//
     *'THREE OPTIONS ARE AVAILABLE TO YOU:'/
     *' 1.PRINTOUT ALL THE RECORDS IN THE WATER-ANALYSIS DATA-FILE'/
     *' 2.PRINTOUT ALL THE RECORDS ADDED TO THE WATER-ANALYSIS'/
     *'        DATA-FILE IN THE LATEST UPDATE'/
     *' 3.PRINTOUT THE RECORDS FOUND BY A SEARCH AND TRANSFERRED'/
     *'        TO THE DATA-FILE "FNDWB"'/
     *' 4.PRINTOUT A NUMBER OF INDIVIDUAL RECORDS'/
     *'        WHOSE RECORD NUMBERS WILL BE SPECIFIED'//
     *'WHICH OPTION DO YOU REQUIRE?(1/2/3/4)')
      READ(5,2) OPTION
    2 FORMAT(I1)
C
      IF ( OPTION.LT.1 .OR. OPTION.GT.4 ) GOTO 50
C
C %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
C READ NUMBER OF RECORDS IN VARIOUS FILES
C %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
      CALL SYSCOM(I,'AC WBD1,1*')
      READ(1,3) MAXNOS
      CALL SYSCOM(I,'AC WBD3,3*')
      READ(3,3) PMAXNS
      CALL SYSCOM(I,'AC WBD5,7*')
```

```
      READ(7,3) FMAXNS
    3 FORMAT(I5)
C
C %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
C ASSIGN VALUES TO "START" AND "FINISH" RECORD NUMBERS
C FOR THE RECORD-WRITING DO-LOOP
C AND ACTIVATE APPROPRIATE RANDOM ACCESS DATA-FILE
C ACCORDING TO THE OPTION REQUIRED
      GOTO (100,200,300,400),OPTION
C
C FOR COMPLETE PRINTOUT OF "WB"
  100 START=1
      FINISH=MAXNOS
      WRITE(6,4) MAXNOS
    4 FORMAT('COMPLETE PRINTOUT OF',I5,' RECORDS IN "WB"')
      CALL SYSCOM(I,'AC WB,2*')
      CALL SYSCOM(I,'AT WB,11*')
      GOTO 500
C
C FOR PRINTOUT OF LATEST UPDATE OF "WB"
  200 START=PMAXNS+1
      FINISH=MAXNOS
      WRITE(6,5) PMAXNS,MAXNOS
    5 FORMAT('PRINTOUT OF UPDATE',I5,' TO ',I5)
      CALL SYSCOM(I,'AC WB,2*')
      CALL SYSCOM(I,'AT WB,11*')
      GOTO 500
C
C FOR PRINTOUT OF RECORDS FOUND BY SEARCH AND TRANSFERRED TO "FNDWB"
  300 START=1
      FINISH=FMAXNS
      IF ( FINISH.EQ.0 ) WRITE(6,6)
    6 FORMAT('NO RECORDS FOUND BY SEARCH.NO PRINTOUT')
      IF ( FINISH.EQ.0 ) GOTO 999
      WRITE(6,7) FMAXNS
    7 FORMAT('PRINTOUT OF',I5,' FOUND RECORDS')
      CALL SYSCOM(I,'AC FNDWB,2*')
      CALL SYSCOM(I,'AT FNDWB,11*')
      GOTO 500
C
C FOR PRINTOUT OF A NUMBER OF INDIVIDUAL RECORDS
  400 WRITE(6,8)
    8 FORMAT('HOW MANY RECORDS DO YOU WISH PRINTED?')
      CALL INFREE(NREC,IER,5)
C CHECK THAT THE NUMBER OR RECORDS REQUESTED IS +VE AND =<50
      IF ( NREC.GT.50 ) WRITE(6,9)
    9 FORMAT('SORRY-YOU CANNOT PRINT MORE THAN 50 RECORDS THIS WAY')
      IF ( NREC.GT.50 ) GOTO 400
      IF ( NREC.LT.0 ) WRITE(6,10)
   10 FORMAT('INPUT OF NEGATIVE NUMBER OF REQUIRED RECORDS'/
     *       'WILL CAUSE SEVERE HICCOUGHS IN THE SYSTEM'/
     *       'PLEASE TYPE IN AGAIN')
      IF ( NREC.LT.0 ) GOTO 400
```

```
C IF 0 RECORDS REQUIRED THEN SKIP PRINT PROCEDURES
      IF ( NREC.EQ.0 ) GOTO 900
      WRITE(6,11) NREC
   11 FORMAT('TYPE IN THE NUMBERS OF THE',I3,' RECORDS REQUIRED')
      CALL NUMIN(RECNOS,NREC,IER,5,COUNT)
C CHECK THAT ALL THE REQUIRED RECORD NUMBERS EXIST IN "WB"
      DO 450 I=1,NREC
         IF ( RECNOS(I).LT.0 .OR. RECNOS(I).GE.MAXNOS ) WRITE(6,12)
   12    FORMAT('YOU HAVE TYPED IN AN ILLEGAL RECORD NUMBER'/
     *          'OR AN INCORRECT NUMBER OF RECORD NUMBERS')
         IF ( RECNOS(I).LT.0 .OR. RECNOS(I).GE.MAXNOS ) GOTO 400
  450 CONTINUE
      WRITE(6,13) NREC
   13 FORMAT('PRINTOUT OF',I3,' RECORDS')
      START=1
      FINISH=NREC
      CALL SYSCOM(I,'AC WB,2*')
      CALL SYSCOM(I,'AT WB,11*')
C
C
C %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
C DETERMINE TYPE OF OUTPUT REQUIRED
C %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
  500 WRITE(6,14)
   14 FORMAT('DO YOU REQUIRE A FULL PRINTOUT, PROOF SHEET OR DATA FILE ?
     * '/'(F/P/D):')
      READ(5,15) PSTYLE
   15 FORMAT(A1)
      IF ( PSTYLE.NE.FULL .AND. PSTYLE.NE.PROOF .AND. PSTYLE.NE.CHARD)
     * GOTO 500
C
      IF ( PSTYLE.EQ.PROOF ) GOTO 700
      IF ( PSTYLE.EQ.CHARD ) GOTO 850
C
C %%%%%%%%%%%%%%%%%%%%%%%%%
C WRITE OUT RECORDS IN FULL
C %%%%%%%%%%%%%%%%%%%%%%%%%
      DO 600 RECORD=START,FINISH
         IF ( OPTION.NE.4 ) IREC=RECORD-1
         IF ( OPTION.EQ.4 ) IREC=RECNOS(RECORD)
         CALL POSITN(2,IREC)
         READ(2) ALINE
C
C CONVERT "TYPE" OUTPUT FROM CODE TO EXPLANATION
         IF (TYPE.EQ.CHARB) TTYPE=TYPEB
         IF (TYPE.EQ.CHARD) TTYPE=TYPED
         IF (TYPE.EQ.CHARS) TTYPE=TYPES
         IF (TYPE.EQ.CHARR) TTYPE=TYPER
         IF (TYPE.EQ.CHARP) TTYPE=TYPEP
         IF (TYPE.EQ.CHARL) TTYPE=TYPEL
C
C CONVERT "ANALRL" AND "ROCKRL" OUTPUT FROM CODE TO EXPLANATION
         DO 650 I=1,6
            IF (ANALRL.EQ.CHARR) AARL(I)=ARLR(I)
```

```
            IF (ANALRL.EQ.CHARD) AARL(I)=ARLD(I)
            IF (ANALRL.EQ.CHART) AARL(I)=ARLT(I)
            IF (ANALRL.EQ.CHARP) AARL(I)=ARLP(I)
            IF (ANALRL.EQ.CHARC) AARL(I)=ARLC(I)
            IF (ANALRL.EQ.CHARE) AARL(I)=ARLE(I)
            IF (ANALRL.EQ.BLANK) AARL(I)=RLUSP(I)
            IF (ROCKRL.EQ.BLANK) RRRL(I)=RLUSP(I)
            IF (ROCKRL.EQ.CHARL) RRRL(I)=RRLL(I)
            IF (ROCKRL.EQ.CHARM) RRRL(I)=RRLM(I)
  650     CONTINUE
C
          FLOWLS=FLOW*4.5/3600
C
C WRITE A RECORD
          WRITE(4,16)
     *              WBNOS,LTNNOS,REFNOS,REF,
     *              TTYPE,
     *              QUADNO,QTITLE(QUADNO,1),QTITLE(QUADNO,2),
     *              SQUARE,EAST,NORTH,
     *              LOCLTY,REGION,
     *              NROCK,ROCK1,ROCK2,ROCK3,ROCK4,RRRL,
     *              CODE1,CODE2,CODE3,LOCRL,AARL,
     *              OMEGA,PH,
     *              TCO3,CL,SO4,SIO2,CA,MG,K,NA,TDS,
     *              FE,AL,NO3,F,
     *              FLOW,FLOWLS,
     *              DHOLE,DWATER
    16   FORMAT(
     *   'IDENTIFICATION:'/
     *   15X,'RECORD NOS(WB):',I5,5X,' LAUNCESTON WATER ANALYSIS NOS:'
     *   ,A8,5X,'REFERENCE:',A8,'(',A6,')',5X/
     *   'TYPE:',A8/
     *   'QUADRANGLE NUMBER:',I2,'(',2A8,')',5X,'AMG REF:',A2,I3,'/',I3/
     *   'LOCALITY:',4A4,10X,'REGION:',4A4/
     *   'NUMBER OF ROCK TYPES ASSOCIATED WITH SAMPLE:',I2/
     *   'ROCK TYPE CODES:',4(X,A2,2X)/
     *   'RELIABILITY OF ROCK-TYPE DATA:',6A8/
     *   'CODES:',3(2X,A1,2X),'        LOCATION RELIABILITY:',A1/
     *   'RELIABILITY OF CHEMICAL ANALYSIS:',6A8/
     *    'CONDUCTIVITY=',F6.1,'uS/cm     PH=',F4.1/
     *   10X,'TOTAL CO3=',F7.1,'PPM'/
     *   10X,'CHLORIDE =',F7.1,'PPM'/
     *   10X,'SULPHATE =',F7.1,'PPM'/
     *   10X,'SILICA   =',F7.1,'PPM'/
     *   10X,'CALCIUM  =',F7.1,'PPM'/
     *   10X,'MAGNESIUM=',F7.1,'PPM'/
     *   10X,'POTASSIUM=',F7.1,'PPM'/
     *   10X,'SODIUM   =',F7.1,'PPM'//
     *   'TOTAL DISSOLVED SALTS',F7.1,'PPM'/
     *   'FE=',F7.1,'AL=',F7.1,'NO3=',F7.1,'F=',F7.1/
     *   'FLOW=',I4,'GALLONS/HOUR      (',I4,'LITRES/SECOND)'/
     *   'DEPTH OF BOREHOLE=',I4,'M      DEPTH TO WATER=',I4,'M'//////)
  600 CONTINUE
```

```
C
      GOTO 900
C
C %%%%%%%%%%%%%%%%%%%%%%%%
C WRITE OUT PROOF SHEET
C %%%%%%%%%%%%%%%%%%%%%%%%
  700 DO 800 RECORD=START,FINISH
        IF ( OPTION.NE.4 ) IREC=RECORD-1
        IF ( OPTION.EQ.4 ) IREC=RECNOS(RECORD)
        CALL POSITN(2,IREC)
        READ(2) ALINE
        WRITE(4,17) WBNOS,LTNNOS,REF,REFNOS,QUADNO,TDS,
     *              SQUARE,EAST,NORTH,TCO3,LOCLTY,CL,REGION,SO4,
     *              NROCK,ROCK1,ROCK2,ROCK3,ROCK4,ROCKRL,SIO2,
     *              CODE1,CODE2,CODE3,CA,ANALRL,LOCRL,MG,
     *              TYPE,K,FLOW,NA,DHOLE,FE,DWATER,AL,OMEGA,NO3,PH,F
   17   FORMAT(
     *  'STORED DATA FOR THE WATER SAMPLE NUMBER,',I5//
     *  '(1)LAUNCESTON ANALYSIS NUMBER   ',A6/
     *  '(2)DATA SOURCE,IDENTIFICATION IN SOURCE:',A6,'/',A8//
     *  '(3)QUADRANGLE NUMBER:',18X,I2,10X,'(16)TDS (PPM):',F7.1/
     *  '(4)AMG 100M GRID REFERENCE:',4X,A2,X,I3,'/',I3,10X,
     *                  '(17)TCO3(PPM):',F7.1/
     *  '(5)LOCALITY:',13X,4A4,10X,'(18)CL  (PPM):',F7.1/
     *  '(6)REGION:',15X,4A4,10X,'(19)SO4 (PPM):',F7.1/
     *  '(7)ROCK TYPE DATA:',8X,I1,X,4(A2,X),A1,10X,
     *                  '(20)SIO2(PPM):',F7.1/
     *  '(8)CODES:',26X,3(X,A1),10X,'(21)CA  (PPM):',F7.1/
     *  '(9)DATA RELIABILITY:',17X,2(X,A1),10X,'(22)MG  (PPM):',F7.1/
     *  '(10)TYPE OF SAMPLE:',21X,A1,10X,'(23)K   (PPM):',F7.1/
     *  '(11)FLOW(G/H):',21X,F6.0,10X,'(24)NA  (PPM):',F7.1/
     *  '(12)DEPTH OF BOREHOLE(M):',10X,F6.1,10X,'(25)FE  (PPM):',F7.1/
     *  '(13)DEPTH TO WATER(M):',13X,F6.1,10X,'(26)AL  (PPM):',F7.1/
     *  '(14)CONDUCTIVITY (uS/cm):',9X,F7.1,10X,'(27)NO3 (PPM):',F7.1/
     *  '(15)PH:',30X,F4.1,10X,'(28)F   (PPM):',F7.1//)
  800 CONTINUE
      GOTO 900
C %%%%%%%%%%%%%%%%%%%%%%%%
C DATA FILE OUTPUT
C %%%%%%%%%%%%%%%%%%%%
  850 WRITE(6,851)
  851 FORMAT('DATA OUTPUT: SELECT X, Y AND Z COMPONENTS FROM:'/
     * '(1) COND  (2) PH  (3) NA  (4) K  (5) MG  (6) CA  (7) ALK'/
     * '(8) FE  (9) AL  (10) F  (11) SIO2  (12) TCO3  (13) CL'/
     * '(14) SO4  (15) NO3  (16) TDS'//'X COMPONENT ?')
      CALL INFREE(ICHAR(1),IER,5)
      IF(ICHAR(1) .LT. 1 .OR. ICHAR(1) .GT. 16)GOTO 850
  854 WRITE(6,855)
  855 FORMAT('Y COMPONENT ?')
      CALL INFREE(ICHAR(2),IER,5)
      IF(ICHAR(2) .LT. 1 .OR. ICHAR(2) .GT. 16)GOTO 854
  856 WRITE(6,857)
  857  FORMAT('Z COMPONENT ?')
      CALL INFREE(ICHAR(3),IER,5)
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      IF(ICHAR(3) .LT. 1 .OR. ICHAR(3) .GT. 16)GOTO 856
      CALL SYSCOM(I,'AC DELDAT,4*')
      WRITE(4,858)
  858 FORMAT('D                                1            ')
  860 DO 870 RECORD=START,FINISH
      IREC=RECORD-1
      CALL POSITN(2,IREC)
      READ(2)ALINE
      DO 865 I=1,3
      IF(ICHAR(I) .EQ. 1)DAT(I)=OMEGA
      IF(ICHAR(I) .EQ. 2)DAT(I)=PH
      IF(ICHAR(I) .EQ. 3)DAT(I)=NA
      IF(ICHAR(I) .EQ. 4)DAT(I)=K
      IF(ICHAR(I) .EQ. 5)DAT(I)=MG
      IF(ICHAR(I) .EQ. 6)DAT(I)=CA
      IF(ICHAR(I) .EQ. 7)DAT(I)=NA+K
      IF(ICHAR(I) .EQ. 8)DAT(I)=FE
      IF(ICHAR(I) .EQ. 9)DAT(I)=AL
      IF(ICHAR(I) .EQ. 10)DAT(I)=F
      IF(ICHAR(I) .EQ. 11)DAT(I)=SIO2
      IF(ICHAR(I) .EQ. 12)DAT(I)=TCO3
      IF(ICHAR(I) .EQ. 13)DAT(I)=CL
      IF(ICHAR(I) .EQ. 14)DAT(I)=SO4
      IF(ICHAR(I) .EQ. 15)DAT(I)=NO3
      IF(ICHAR(I) .EQ. 16)DAT(I)=TDS
  865 CONTINUE
      DO 868 I=1,3
      IF(DAT(I) .LT. 0.0)DAT(I)=0.0
  868 CONTINUE
      WRITE(4,861)DAT(1),DAT(2),DAT(3),REF,REFNOS
  861 FORMAT(1X,3(F7.1,1X),4X,A6,A8)
  870 CONTINUE
      WRITE(4,871)
  871 FORMAT('E                                2            ')
      ENDFILE 4
C %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
C PRINT DESCRIPTION OF OUTPUT
C %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
  900 IF (OPTION.EQ.1) WRITE(4,4) MAXNOS
      IF (OPTION.EQ.2) WRITE(4,5) PMAXNS,MAXNOS
      IF (OPTION.EQ.3) WRITE(4,7) FMAXNS
      IF (OPTION.EQ.4) WRITE(4,13) NREC
  999 STOP
      END
```