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PINE CREEK ROCKCHEM DATA SET DOCUMENTATION

RECORD 1991/40



by L.A.I. Wyborn and R.J. Ryburn

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Pine Creek

Rockchem Data Set

Documentation

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by



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L.A.I. Wyborn and R.J. Ryburn

DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY

Minister: The Hon. Alan Griffiths

Secretary: G.L. Miller

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

Executive Director: R.W.R. Rutland AO

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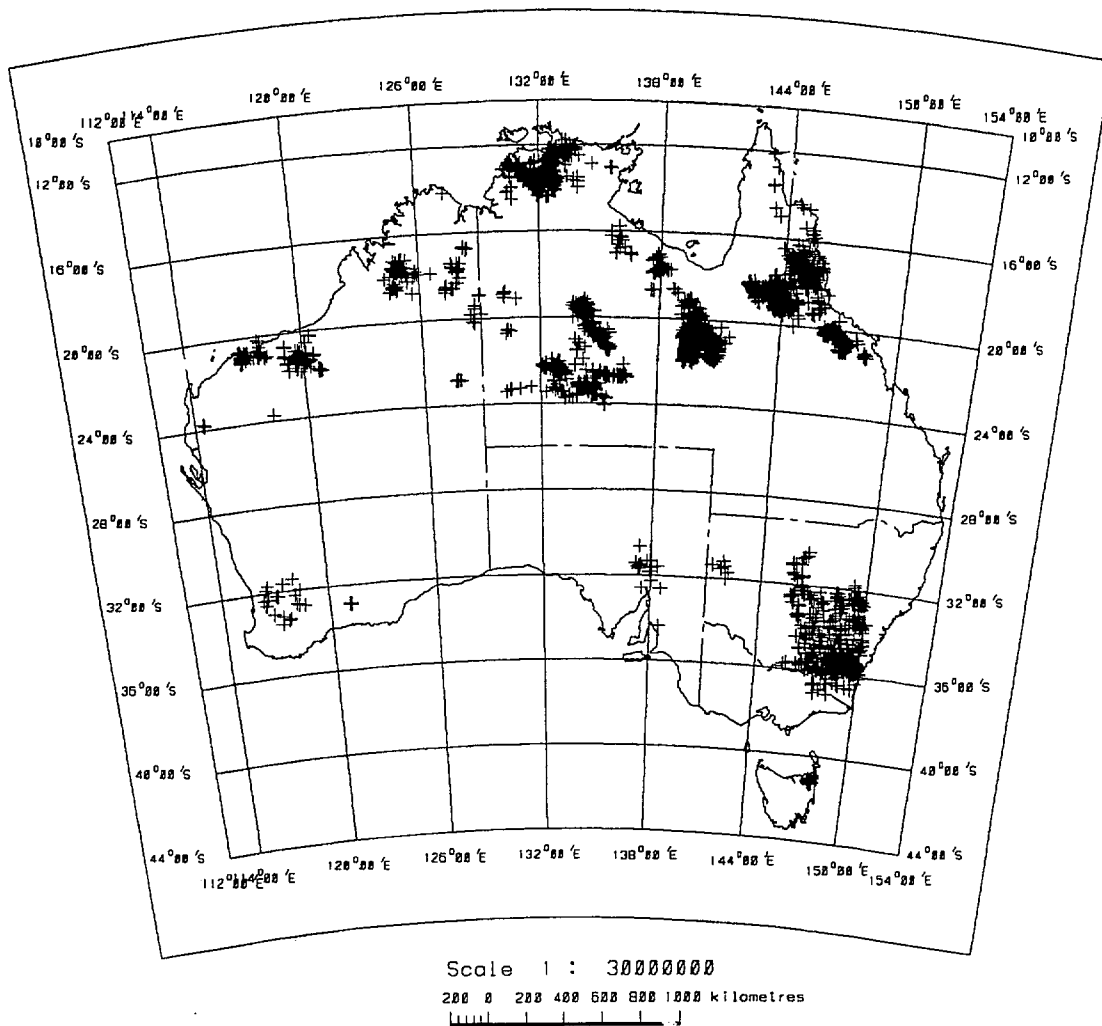
ABSTRACT

ROCKCHEM is the whole rock geochemical data storage system of the Minerals and Land Use Program of the BMR, Geology and Geophysics and utilises the relational database management system ORACLE. This data set contains approximately 2547 analyses (both major and trace elements) from Pine Creek. Most samples are located by AMG grid references and/or decimal latitude and longitude. This record describes tables used in ROCKCHEM and defines the fields used within these tables. A short description of the data contained is given and a bibliography of the main references that were generated from the data.

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Simple Conic Projection
 Standard parallels
 18° 00' S and 36° 00' S

Figure 1. Distribution of Rockchem samples in Australia.

1. INTRODUCTION

ROCKCHEM is the whole-rock geochemical data storage system of the Minerals and Land Use Program of the BMR Geology and Geophysics, Australia. It is based on the commercial relational database management system ORACLE. The complete database contains approximately 17445 analyses from Australia (see Figure 1) and Antarctica, and can be divided into either regional or thematic data sets. The data is currently subdivided into the data sets as listed in Table 1. Most of these data sets will be released by late 1991.

Subset	Areas Covered	No. of Analyses	Coordinator
Regional Databases			
Antarctica	Antarctica	1318	J.W. Sheraton
Arunta	Arunta Block	793	R.G. Warren
Lachlan	Lachlan Fold Belt NE Tasmania NW Tasmania	1149 300 40	D. Wyborn
McArthur	McArthur Basin Murphy Tectonic Ridge	533 74	K. Plumb, L. Wyborn
Mount Isa	Mount Isa Inlier	2296	L. Wyborn
NE Queensland	Georgetown Inlier NE Queensland	1940	D.E. Mackenzie
Pilbara	Pilbara Block	1386	A.Y. Glikson
Pine Creek	Pine Creek Inlier	2547	L. Wyborn
South Australian Proterozoic	Stuart Shelf Adelaide Geosyncline	232	J. Knutson
Tennant Creek	Tennant Creek Inlier Davenport Province	1431 170	L. Wyborn
West Australian Proterozoic	Capricorn Province Granites Tanami Block Halls Creek Block	227 56 164	L. Wyborn
Yilgarn	Yilgarn Block	400	P.R. Williams
Thematic Databases			
Alkaline	Kimberlites Alkaline Rocks	880	A.L. Jaques
EAVS	East Australian Volcanics(Cainozoic)	2000	J. Knutson

Table 1. List of Data Sets in Rockchem.

2. THE PINE CREEK DATA SET

This ROCKCHEM data set is a release of approximately 2547 analyses from the Pine Creek region. Figure 2 shows the distribution of the analyses within the region. Appendix 1 contains listings of the individual components of the data set.

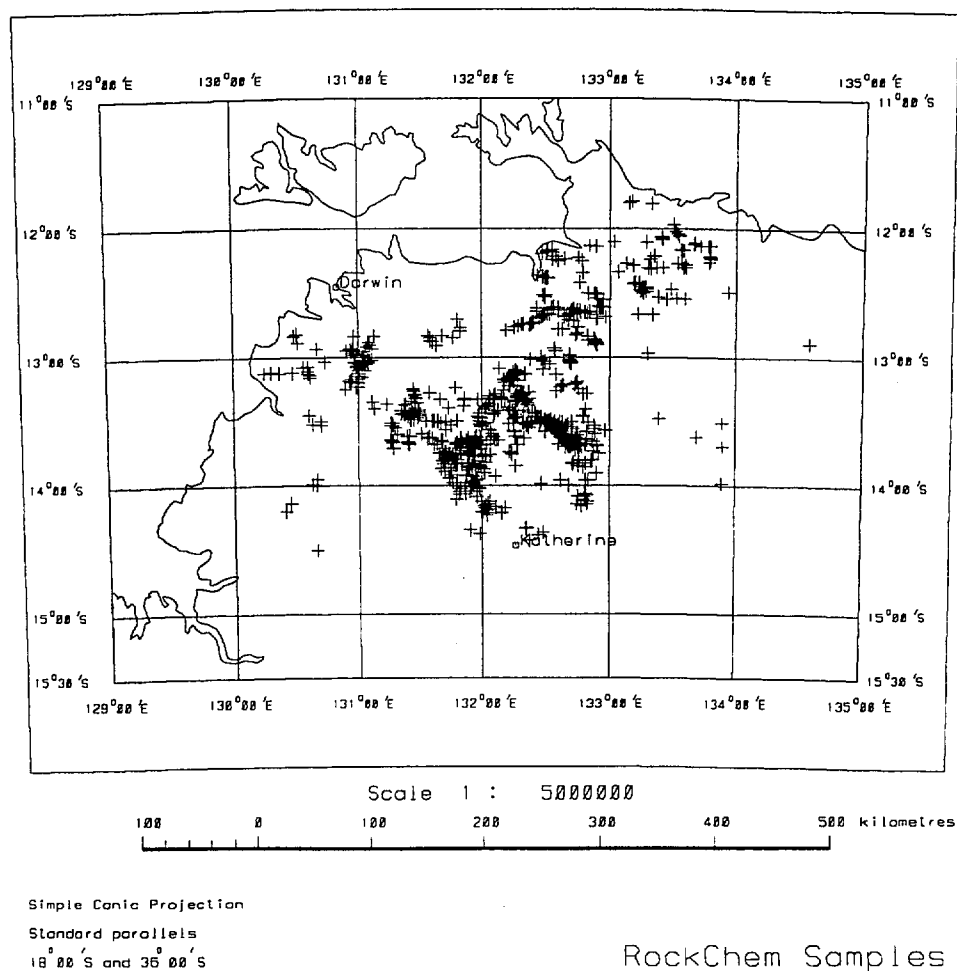


Figure 2. Rockchem samples in the Pine Creek region.

Pine Creek Inlier Database

Database type: regional

General Selection Criteria:

Field = regiono *Entry* = 32

Data description:

This database contains approximately 2547 analyses from almost all Precambrian units in the Pine Creek Inlier. Most of the data were collected as part of the BMR and Northern Territory Geological mapping programs. The data can be divided into 6 main groups.

- A compilation of 350 whole rock analyses by Ferguson and Winer (1980) completed up to 1978 in the Pine Creek Inlier. At least one third of these analyses do not include trace elements.
- A group of 346 analyses of sediments from the early Proterozoic Pine Creek Geosyncline obtained by Ewers (1982) and published by Ewers & Higgins (1985) and Ewers & others (1985).
- 350 analyses of samples from the Cullen Batholith, 120 collected by Ewers and Scott (1977), the remainder by P. Stuart-Smith (1987).
- 562 analyses of samples collected since 1978 in association with 1:100 000 geological mapping. The samples mainly come from the southern and central part of the Pine Creek Inlier and are representative of most of the major rock units and include some sampling of significant regolith profiles developed on both Proterozoic and Archaean rock units.
- 459 whole rock analyses from the former South Alligator Conservation Zone.
- 480 rock chip samples from prospects and mines in the Kakadu Conservation Zone.

Future Work:

None planned.

Bibliography:

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- Ewers, G.R. and Higgins, N.C., 1985. Geochemistry of the early Proterozoic metasedimentary rocks of the Alligator Rivers Region, Northern Territory, Australia. *Precambrian Research*, 29, 331-357.
- Ewers, G.R., Needham, R.S., Stuart-Smith, P.G., and Crick, I.H., 1985. Geochemistry of the low-grade early Proterozoic sedimentary sequence in the Pine Creek Geosyncline, Northern Territory. *Australian Journal of Earth Sciences*, 32, 137-154.

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3 . STRUCTURE OF THE ROCKCHEM DATABASE

The ROCKCHEM database contains seven main tables of data and eleven associated 'authority' tables. The names of the tables are as follows and full definitions are listed in Appendix 2.

Table Name	Contents
Main Tables	
SAMPLES	Samples and their locations and provenance
SAMPLESPLITS	Sample splits and their storage
MAJORS	Major element analyses in weight percentages of oxides
TRACES	Trace element analyses in parts per million
PPB	Trace element analyses in parts per billion
ROCKPROPS	Density and magnetic rock properties
REFERENCES	Bibliographic references
Authority tables	
ORIGINATORS	List of valid contributors
COUNTRIES	List of valid countries
STATES	List of valid Australian States
REGIONS	List of valid regions
HMAPS	List of valid 1:100 000 maps
ROCKTYPES	List of valid rock types
STOREBOXES	List of valid boxes in BMR Museum
SOURCES	List of valid analytical laboratories
METHODS	List of valid analytical methods
MAXNOS	Table for highest index number in the database

The fields in the main tables are described in section 4. The authority tables are described in section 5. They generally consist of a number and a text field. For example, the REGIONS table consists of a region number and a region name (see Appendix 2). The region names in this table are unique. Each region appears once, and only once, in this table, and nowhere else in the database. The SAMPLES table refers ('relates') to the region name via its associated number.

4. DESCRIPTION OF THE MAIN TABLES

4.1 THE SAMPLES TABLE

This table contains information about samples and their provenance. The Samples Block contains the following relational fields - ORIGINATORS, ROCKTYPES, COUNTRIES, STATES, REGIONS, HMAPS, and REFERENCES (up to 5 different references can be entered for each sample). With each authority field, there is an associated table containing the value pointed to by a number or in the case of COUNTRIES, a 3-letter mnemonic. The number (or mnemonic) is the only information stored in the SAMPLES table, the values are stored separately in the relevant authority table.

All fields are either mandatory or optional. All BMR users must enter the mandatory fields before the geochemical data can be entered.

Description of Fields:

Origno - Mandatory relational field of 5 digits. The originator is represented by a number and the full name is recorded in the relational 'ORIGINATORS' table. The originator is generally the person or organization that collects the sample and/or submits it for laboratory work. The main purpose of this field is to ensure a unique combination of originator and sample number.

Sample Number - Mandatory field of 16 characters. Any combination of letters and numbers may be entered, provided that it is unique to the originator. All BMR samples should have registered 8 digit numbers, which should be unique. The first two digits in the BMR sample number refer to the year in which the sample was collected, the next two digits refer to a region in Australia (e.g. Arunta, Pine Creek), and the remaining four numbers are used by individuals belonging to that project at their discretion.

Field Number - Optional field of 16 characters. This field is designed to accommodate any alternative numbering systems that might apply to a sample or group of samples. For example, some samples are given field numbers that differ from the final registered numbers.

Group or Batholith - Optional field of 64 characters, giving the name of the stratigraphic group or igneous batholith from which the sample was collected.

Subgroup or Suite - Optional field of 64 characters, giving the name of the stratigraphic subgroup or igneous suite pertaining to the sample.

Stratigraphic Formation - Optional field of 64 characters, giving the relevant stratigraphic unit at formation level.

Stratigraphic Member - Optional field of 64 characters for the name of a stratigraphic member, if appropriate.

Stratigraphic Height - Optional number field with up to two decimal places. Designed for samples from measured stratigraphic sections.

Map Symbol - Optional field of 10 characters: the letter symbol used on 1:100 000 or 1:250 000 geological maps for the rock unit from which the sample was collected.

Rock Type - Mandatory relational field of 5 digits. See the description of the authority tables for the list of 18 permissible rock types, 1 being 'unknown'.

Lithology - Optional field of 64 characters for a full lithological description.

Grouping - Optional field of 22 characters to allow the user to supply other divisions for samples, for example, the alteration zones of an ore body.

Age - Optional field of 64 characters for the geological age, e.g., late Ordovician. If known, the absolute age is included in brackets, e.g., early Proterozoic (1860 Ma).

References - 5 optional relational numeric fields of 5 digits each. The full reference is listed in the REFERENCES table.

Country - Mandatory relational field of 3 capital letters. The default value is 'AUS'.

State - Relational field of 3 capital letters, mandatory if country is Australia. Only the standard capital letter abbreviations for Australian states can be entered in this field, and it cannot be used for other countries.

Region - Mandatory relational field of 5 digits. Only those regions in the REGIONS table may be entered. A region is a recognised geological province or area such as the Lachlan Fold Belt, Mount Isa Inlier, or Carnarvon Basin. As regions may overlap one another, the region that is entered is dependent on the purpose for which the sample was collected.

Geographic Area - Optional 64 character field for the name of the geographic area (e.g., valley, plain, mountain range) from which the sample comes. Examples are 'Newcastle Range' and 'Tuggeranong Valley'. Another purpose for which this field is used is for subprovinces of major regions (e.g., the Leichhardt River Fault Trough of the Mount Isa Inlier).

Locality - Optional 64 character field for a description of the sample site to aid in its relocation in the field. For example, '5.5km NW of Brown's Bore, on east bank of dry creek'.

1:100 000 Map - Relational field of 4 digits, mandatory if country is Australia. The number supplied must identify one of the standard series 1:100 000 map in the HMAPS table. In insert or update mode, the name may be entered and the number retrieved automatically. Only the map number is stored in the SAMPLES table.

Grid Reference - Field of 6 digits, mandatory if 1:100,000 map name is given. The 6 digit reference required is that described on the face of Australian 1:100 000 maps. The grid reference given must be metric and on the Australian National Spheroid.

Decimal Latitude - Field of 8 digits, mandatory if sample is not from Australia. Up to 6 digits may follow the decimal point. For most samples this field has been entered using a BMR program called 'GetLat', which calculates latitudes and longitudes from the 1:100 000 maps and metric grid references.

North or South - Single character field, 'S' by default. Only 'N' or 'S' may be entered.

Decimal Longitude - Field of 9 digits, 7 of which may follow the decimal point. Otherwise as for latitude.

East or West - Single character field 'E' by default. Only 'E' or 'W' may be entered. Make sure this field is correctly filled in for samples from outside Australia (e.g. Antarctica). It must be given as 'W' for latitudes measured west of the Greenwich Meridian.

Drill Hole - Optional field of 22 characters. If the sample is from a drill hole, its name, or some other identification, is required.

Depth in Metres - Optional field of 10 characters. The depth of the sample from within the drill hole. A character field is used here to enable depth ranges to be entered, e.g., '112- 115' - as some samples are collected from finite depth intervals.

Other Data - Optional field of 64 characters. May be used for any data not covered by the above fields that the originator feels are relevant.

Entry Date - Invisible date field. This field automatically assumes the date that the sample data is inserted into the SAMPLES table via the form.

4.2 THE SAMPLE SPLITS TABLE

This table indicates the sample type (whole rock geochemistry, geochronology, thin section, hand specimen etc.) and the number of the box that the sample is stored in within the BMR museum.

Description of Fields:

Origno - Mandatory relational field of 5 digits. The originator is represented by a number and the full name is recorded in the relational 'Originator Table'. The originator is generally the person or organization that collects the sample and/or submits it for laboratory work. The main purpose of this field is to ensure a unique combination of originator and sample number.

Sample Number - Mandatory field of 16 characters. Any combination of letters and numbers may be entered, provided that it is unique to the originator. All BMR samples should have registered 8 digit numbers, which should be unique. The first two digits in the BMR sample number refer to the year in which the sample was collected, the next two digits refer to a region in Australia (e.g. Arunta, Pine Creek), and the remaining four numbers are used by individuals belonging to that project at their discretion.

Sample Type - Mandatory relational field of 5 digits. The sample type entered must be one of those in the SAMPLETYPES table, e.g., 'whole-rock analysis' or 'geochronology'.

Storebox - Optional numeric field of up to 5 digits. This number must correspond to a Storebox number already in the STOREBOXES table. Although most existing samples do not yet have a storebox number, it is a requirement for all new samples housed in the BMR museum to have a storebox number.

4.3 THE MAJORS TABLE

The majors table contains all of the major element data with all values expressed as weight percentages of oxides.

Description of Fields:

Sample Number - Mandatory field of 16 characters. Any combination of letters and numbers may be entered, provided that it is unique to the originator. All BMR samples should have registered 8 digit numbers, which should be unique. The first two digits in the BMR sample number refer to the year in which the sample was collected, the next two digits refer to a region in Australia (e.g. Arunta, Pine Creek), and the remaining four numbers are used by individuals belonging to that project at their discretion.

Analysis Number - Mandatory field of up to 5 digits. Primary key field assigned by the system; it cannot be inserted or updated. It may be used to query the tables.

Origno - Mandatory relational field of 5 digits. The originator is represented by a number and the full name is recorded in the relational 'Originator Table'. The originator is generally the person or organization that collects the sample and/or submits it for laboratory work. The main purpose of this field is to ensure a unique combination of originator and sample number.

Source Number - Mandatory relational field of up to 5 digits. The 'source' of an analysis is normally the laboratory that performed the analysis or the person or organization that provided the data (e.g., BMR, BMR restricted, BHP, B.W. Chappell). The SOURCES table contains the authority list of all sources.

Method Number - Mandatory relational field of up to 5 digits describing the method by which the laboratory analysis was performed. The details of the analytical techniques used are in the METHODS table.

Major Elements - Optional numeric fields of up to 4 digits, two after the decimal point. Automatically right justified. Detection limit values are entered as negative numbers and it is impossible to enter '<' or 'n.d.'.

***Fe₂O₃** - This field is reserved for total iron as Fe₂O₃. It should be entered only for analyses in which the oxidation state of iron has not been determined. Where this field is entered, the fields for FeO and Fe₂O₃ should be left empty.

Rest - Trace elements are converted to oxide percent, summed and then added to the total.

Total - Optional numeric field of up to 5 digits. This is for an entered total.

Calculated Total - The value in this field is automatically calculated from the data in the major element fields. It cannot be entered and is not a database field. Except where detection limit values are involved, this field provides a check on the entered total; the two should coincide. Because detection limit values are entered as negative numbers, they are subtracted from the calculated total.

4.4 THE TRACES TABLE

This table includes all trace elements in ppm.

Description of Fields:

Sample Number - Mandatory field of 16 characters. Any combination of letters and numbers may be entered, provided that it is unique to the originator. All BMR samples should have registered 8 digit numbers, which should be unique. The first two digits in the BMR sample number refer to the year in which the sample was collected, the next two digits refer to a region in Australia (e.g. Arunta, Pine Creek), and the remaining four numbers are used by individuals belonging to that project at their discretion.

Analysis Number - Mandatory field of up to 5 digits. Primary key field assigned by the system; it cannot be inserted or updated. It may be used to query the tables.

Origno - Mandatory relational field of 5 digits. The originator is represented by a number and the full name is recorded in the relational 'Originator Table'. The originator is generally the person or organization that collects the sample and/or submits it for

laboratory work. The main purpose of this field is to ensure a unique combination of originator and sample number.

Source Number - Mandatory relational field of up to 5 digits. The 'source' of an analysis is normally the laboratory that performed the analysis or the person or organization that provided the data (e.g., BMR, BMR restricted, BHP, B.W. Chappell). The SOURCES table contains the authority list of all sources.

Method Number - Mandatory relational field of up to 5 digits describing the method by which the laboratory analysis was performed. The details of the analytical techniques used are in the METHODS table.

Trace Elements - Optional numeric fields of up to 8 digits, two of which may be after a decimal point. The fields are automatically right justified and as is the case for major elements, a negative entry signifies a detection-limit value.

4.5 THE PPB (parts per billion) TABLE

This table includes all trace elements in ppb.

Description of Fields:

Sample Number - Mandatory field of 16 characters. Any combination of letters and numbers may be entered, provided that it is unique to the originator. All BMR samples should have registered 8 digit numbers, which should be unique. The first two digits in the BMR sample number refer to the year in which the sample was collected, the next two digits refer to a region in Australia (e.g. Arunta, Pine Creek), and the remaining four numbers are used by individuals belonging to that project at their discretion.

Analysis Number - Mandatory field of up to 5 digits. Primary key field assigned by the system; it cannot be inserted or updated. It may be used to query the tables.

Origno - Mandatory relational field of 5 digits. The originator is represented by a number and the full name is recorded in the relational 'Originator Table'. The originator is generally the person or organization that collects the sample and/or submits it for laboratory work. The main purpose of this field is to ensure a unique combination of originator and sample number.

Source Number - Mandatory relational field of up to 5 digits. The 'source' of an analysis is normally the laboratory that performed the analysis or the person or organization that provided the data (e.g., BMR, BMR restricted, BHP, B.W. Chappell). The SOURCES table contains the authority list of all sources.

Method Number - Mandatory relational field of up to 5 digits describing the method by which the laboratory analysis was performed. The details of the analytical techniques used are in the METHODS table.

Trace Elements - Optional numeric fields of up to 8 digits, 3 of which may be after a decimal point. The fields are automatically right justified and as is the case for major and trace elements, a negative entry signifies a detection-limit value.

4.6 THE REFERENCES TABLE

The bibliographic References Form accesses the REFERENCES table. The authors and year fields are spanned by a concatenated unique index. This means that no two references can have the same values in the author(s) and year fields.

Description of Fields:

Reference Number - Mandatory field of up to 5 digits. A monotonically increasing primary key field assigned by the system. The reference number in the fields in the samples table refer to this field.

Other ID - Optional field of up to 16 characters. Any other identifying sequence that the user may care to apply.

Username - Mandatory field of up to 16 characters.

Authors - Mandatory field of up to 128 characters.

Year - Mandatory field of up to 16 characters.

Title - Optional field of up to 240 characters.

Source - Optional field of up to 240 characters - the journal name, volume and page numbers.

5. DESCRIPTION OF AUTHORITY TABLES

5.1 THE 1:100 000 MAPS FORM

The 1:100 000 maps form table has the underlying HMAPS table as an important table in its own right.

Description of Fields:

100K Map Number - The unique four digit number for any 1:100 000 map sheet from Australia.

1M Map ID - The 1:1 000 000 map sheet in which the 1:100 000 sheet lies. This is identified by two capital letters followed by two numbers, e.g., 'SF54'. The two digits are the UTM zone, which is needed to convert metric references to latitude and longitude.

250K Map Number - Up to 2 digits identifying the 1:250 000 map sheet from 16 covering each 1:1 000 000 map area. The full 1:250 000 map ID is obtained by joining the 1:1 000 000 map ID to this number, e.g., SF54-12, which is the Winton 1:250 000 map sheet, in Queensland. Note that the 1:250 000 map sheets in Tasmania are the theoretical ones, not the shifted ones actually published.

100K Map Name - Up to 22 upper case characters for the name of the 1:100 000 map sheet identified by the 100K Map Number. There are many offshore sheets which are named 'UNNAMED'.

100K Map NW Corner Lat. & Long. - The decimal latitude and longitude of the northwest corner of the 1:100 000 map sheet. It is possible, using a single SQL*Plus command, to make use of this field to select a 1:100 000 map name for any given latitude and longitude.

100K Map AMG Ref. SW Corner Easting and Northing - The metric easting and northing of the southeast corner of the 1:100 000 map sheet. These values are necessary to convert a 6-digit grid reference obtained from a 1:100 000 map to the full Australian Map Grid metres east and metres north.

5.2 COUNTRIES TABLE

This table is for recognised countries. All have an associated ID.

ID	Country
AUS	Australia
PNG	Papua-New Guinea
SI	Solomon Islands
ANT	Antarctica
UK	United Kingdom
SEA	International Waters

5.3 STATES TABLE

This table is for the states of Australia only and all have a set ID.

ID	STATE
???	unknown
ACT	Australian Capital Territory
NSW	New South Wales
NT	Northern Territory
QLD	Queensland
SA	South Australia
TAS	Tasmania
VIC	Victoria
WA	Western Australia

5.4 ORIGINATOR TABLE

This table refers to the collector of the sample in the field. With some BMR authors, it is possible to refer to original sample note books which are stored within BMR so as to obtain more precise location descriptions of any samples that are of interest.

The following list gives the key for the entries in this authority table.

ORIGNO	ORIGINATOR
1	unknown
2	Blake, D.H.
3	Branch, C.D.
4	Bultitude, R.J.
5	Gardner, C.
6	Croxford, W.
7	Cruikshank, B.I.
8	Hoatson, D.M.
10	Dallwitz, W.B.
11	Derrick, G.M.
12	Duff, B.
13	Ellis, D.J.
14	England, R.N.
15	Ewers, G.R.
16	Warren, R.G.
17	Glikson, A.Y.
18	Tanaka, H.
19	Hill, R.M.
20	Holmes, R.D.
21	Hutton, L.J.
22	Lambert, I.
23	Knutson, J.
24	Jaques, A.L.
25	Chapple, K.
27	Lewis, J.D.
28	Etheridge, M.
29	Mackenzie, D.E.
30	McNaughton, N.
31	Mitchell, J.M.
32	Mock, C.M.
33	Higgins, N.C.
34	Oversby, B.S.
35	Cook, P.
36	Stuart-Smith, P.G.
37	Page, R.W.
38	Plumb, K.A.
39	Valenta, R.
40	Needham, R.S.
41	Santul, J.
42	Sheraton, J.W.
43	Smith, S.E.
44	Tunks, A.
45	Wallace, D.A.
46	Willmott, W.F.
47	Wilson, I.H.
48	Withnall, I.W.
49	Wyborn, D.
50	Wyborn, L.A.I.
51	Bain, J.H.C.

52	Johnson, R.W.
53	Williams, P.R.
54	Miller, A.
55	Bettenay, L.
56	Black, L.P.
57	Pederson, C.P.
58	Ferguson, J.
59	Hegge, M.R.
60	Wilkes, P.G.
61	Roberts, W.M.B.
62	Walpole, B.
63	Joplin, G.
64	Crick, I.
65	Hills, J.
66	Rhodes, J.
67	Smart, P.
68	Sweet, I.P.
69	Shaw, R.D.
70	Stewart, A.J.
71	Wyche, S.
72	Watchman, A.
73	Stuart, J.E.
74	Stratton, J.
75	Duggan, M.B.
76	Yeates, A.N.
77	ANU RSES
78	Allen, A.R.
79	Bofinger, V.M.
80	Gee, R.D.
81	De Laeter, J.R.
82	Cooper, J.A.
83	Williams, S.J.
84	Windrim, D.P.
85	Gray, C.M.
86	Ludwig, K.R.
87	Currie, K.L.
88	Chin, R.J.
89	Mortimer, G.E.
90	Marjoribanks, R.W.
91	Webb, A.W.
92	Langworthy, A.P.
93	SADME
94	Jagodzinski, E.A.
95	Compston, W.
96	Freeman, M.J.
97	Offe, L.A.
98	Bagas, L.
99	Joklik, G.F.
100	Korsch, R.
101	Dobos, S.K.
102	Foden, J.D.
103	Roarty, M.J.
104	Pidgeon, R.T.
105	W.A. Geological Survey
106	Southgate, P.N.
107	Kralik, M.
108	Richards, J.R.
109	McDougall, I.
110	Turek, A.

111	Collins, W.J.
112	Kinny, P.D.
113	Heinrich, C.A.
114	Hill, R.I.
115	Henderson, G.A.M.
116	Johnston, C.
117	Richards, D.
118	Bailey, J.
119	Blewett, R.S.
120	Chappell, B.W.C.
121	Adams, C.J.
122	Turner, N.J.
123	Perason, P.J.
124	Rao, C.P.
125	McCulloch, M.T.
126	Vanderhor, F.
127	Rattenbury, M.S.
128	Young, D.N.
129	Arriens, P.A.

5.5 REGIONS TABLE

The following list of regions was initially compiled from all the existing data bases. However, for the purpose of database management, only a select number of major regions are now used for the Australian section of this data set. Those that have been used with the regional databases are marked * in the list below. Most of those Australian regions listed below now entered in the field "Geogarea"; Antarctic regions used are marked +.

REGIONO	REGION
1	unknown
2	Adelaide Fold Belt
3	Albany-Fraser Province
4	Arunta Block *
5	Bunger Hills +
6	Cape York Peninsula
7	Carnarvon Basin
8	Commonwealth Bay +
9	Cummins Range
10	Davenport Province *
11	Denman Glacier +
12	East Kimberley
13	Enderby Land +
14	Gawler Craton
15	George V Land +
16	Georgetown Inlier
17	Halls Creek Inlier *
18	Kemp Land +
19	Lachlan Fold Belt *
20	Lawn Hill Platform
21	Mawson Coast +
22	McArthur Basin
23	Mount Isa Inlier *
24	Northern Prince Charles Mountains +
25	NE Queensland *
26	NE Tasmania
27	NW Tasmania

29	North Victoria Land +
30	North Kimberley
31	Pilbara Block *
32	Pine Creek Inlier *
33	Prydz Bay Coast +
34	Southern Prince Charles Mountains +
35	Stuart Shelf *
36	Granites-Tanami Block *
37	Tasman Fold Belt
38	Tasmania
39	Tennant Creek *
40	Turee Creek
41	Tuross
42	Vestfold Hills +
43	West Kimberley
44	Wilhelm II Land +
45	Wilkes Land +
46	Willyama Block
47	Yilgarn Block
48	Hammersley Basin
49	SE Tasmania
50	SW Tasmania
51	New Georgia Island
52	Eastern Goldfields
53	Capricorn Orogen *
54	Ashburton Trough
55	Gascoyne Province
56	Glengarry Sub-basin
57	Earaheedy Sub-basin
58	Murphy Tectonic Ridge
59	South Nicholson Basin
60	Westmoreland Region
61	New England Fold Belt
62	Sydney Basin
63	Admiralty Islands
64	Birrindudu Basin
65	Bangemall Basin
66	Musgrave Block
67	Paterson Province
68	Amadeus Basin
69	Ammaroodinna Inlier
70	Peake Denison Inlier
72	Georgina Basin
73	Curnamona Inlier
74	Carpentaria Province
75	Northampton Block
76	Houghton Inlier
77	Bougainville
78	Tabar-Feni
79	New Britain
80	St. Andrews Strait
81	Fly Highlands
82	Manus Basin
83	Eastern Papua
84	Officer Basin
85	Woodlark Basin

5.6 ROCK TYPES TABLE

This table provides a coarse subdivision of samples based on broad rocktypes. It was initiated primarily for database management and block retrieval, and for future online extraction of data. For example, this table can be used to extract all mafic extrusive rocks from the database or all alkaline rocks. The following gives a list of the 18 permitted rock types:

ROCKNO	ROCKTYPE
1	unknown
2	felsic intrusive
3	intermediate intrusive
4	mafic intrusive
5	felsic extrusive
6	intermediate extrusive
7	mafic extrusive
8	ultramafite
9	alkaline igneous
10	clastic sediment
11	chemical sediment
12	metabasite
13	felsic gneiss
14	metasediment
15	metasomatite
16	ore
17	regolith
18	mixed clastic/chemical sediment

5.7 SAMPLE TYPES TABLE

This table gives an indication of the nature of work that has been carried out on each individual sample.

SAMPLETYPENO	SAMPLETYPE
1	unknown
2	whole-rock geochemistry
3	geochronology
4	hand specimen
5	thin section
6	geochronology K-Ar
7	geochronology Ar-Ar
8	geochronology Rb-Sr
9	geochronology Sm-Nd
10	geochronology U-Pb minerals
11	geochronology U-Pb SHRIMP
12	geochronology Pb-Pb
13	geochronology Pb-Pb ores
14	geochronology Lu-Hf
15	geochronology Re-Os
16	geochronology fission-track
17	geophysical properties
18	geochemical rock chip samples

5.8 SOURCES TABLE

This table gives the laboratory or organisation which analysed the sample.

SOURCENO	SOURCE
1	unknown
2	ANU
3	Adelaide University
4	AMDEL
5	BMR
6	BMR restricted
7	CSIRO/BMR
8	Macquarie University
9	Melbourne University
10	NTGS (AMDEL)
11	WA Govt. Chem. Lab.
12	WA/BMR Restricted
13	University of Queensland
14	James Cook University of North Queensland
15	Tasmanian Department of Mines
16	University of Tasmania
17	Queensland Department of Mines
18	BGR (Bundesanstalt für Geowissenschaften und Rohstoffe)
19	Labtech Pty. Ltd., WAIT, WA Govt. Chem. Lab., Perth.
20	Institute for Petrology, Copenhagen University, Denmark
21	ANALABS
22	BMR/CRAE - T.Stachel

5.9 METHODS TABLE

This table describes the analytical methods used in deriving the analyses.

METHODNO	METHOD
1	unknown
2	XRF (Norrish & Hutton, 1969); FeO Vol.; LOI Grav.
3	XRF (Norrish & Hutton, 1969); FeO Vol.; H ₂ O ⁺ , H ₂ O ⁻ , & CO ₂ Grav.
4	XRF (Norrish & Chappell, 1977); Ag, Be, Co, Li by AAS
5	XRF (Norrish & Chappell, 1977); Ag, Be, Co, Cu, Li, Ni, Zn by AAS
6	XRF (Norrish & Hutton, 1969); FeO, H ₂ O(total), CO ₂ by AMDEL
7	XRF (Norrish Chappell 1967); Li Be Cr Co Ni Cu Zn Sn AAS F AMDEL
8	Rb, Sr by XRF (Norrish & Chappell, 1967); Ni, Co, V by AAS
9	XRF (Norrish & Chappell, 1977); FeO vol.; LOI grav.
10	XRF (N & C, 1977); REE Hf Ta Cr Sc Sb Cs INA; Th U Gamma spectrm
11	XRF (N & C, 1977); REE Hf Ta Sb Cs INAA; U delayed neutron count
12	XRF (Norrish & Chappell, 1977).
13	XRF (Norrish & Chappell, 1977); Co Cu Ni Pb Zn by emiss.
14	ICP,AES Inductively Coupled Plasma, Atomic Emission
15	XRF (N & C, 1977) at ANU; Na, K by AAS (JCUNQ).
16	XRF(N&C 1977) UQ; REE Th U Pb Hf Ba Cs Sn Mo Nb Y Bi W MS7 RSES.

17 AMDL 'wet' chem. +/- XRF (N & H, 1969)?
 18 Tas. Dept. Mines Assay Labs Launceston: "classical methods".
 19 J. Klominsky & D.I. Groves: X-ray spectrography.
 20 XRF (Norrish & Chappell, 1977); REE, Sc, Hf, Th, U INAA
 21 XRF (N & C, 1977); REE ion-exchange/XRF (Robinson & others, 1986)
 22 AMACHEM Nickel sulfide assay- neutron activation.
 23 XRF (Norrish & Hutton, 1969) on 1:1 purified silica mix
 24 AAS
 25 ANALABS: fire assay, Pb collection, carbon rod finish (30g samp)
 26 ANALABS: fire assay fusion, AAS finish (30g sample)
 27 ANALABS: combination of methodno = 25 (Pd & Pt) and 26 (Au)
 28 RNAA from Melbourne University
 29 ANALABS: fire assay, lead collection; ICP-MS finish
 30 Direct-reading optical spectrograph (DROS), BMR.

Appendix 1 - Listings of the components of the Pine Creek Data Set.

A1.1 Samples assigned to Stratigraphic Groups.

STRATGROUP	COUNT (*)
unassigned	777
Cullen Batholith	290
Edith River Group	47
El Sherana Group	392
Finniss River Group	66
Kakadu Group	9
Katherine River Group	63
Litchfield Batholith	33
Mount Partridge Group	111
Namoonna Group	106
Nanambu Complex	132
Nimbuwah Complex	47
Rum Jungle Complex	30
South Alligator Group	431
Waterhouse Complex	12
mixed El Sherana / South Alligator Group	1

A1.2 Samples assigned to Subgroups.

SUBGROUP	COUNT (*)
unassigned	2547

A1.3 Samples assigned to Stratigraphic Units.

STRATUNIT	COUNT (*)
unassigned	136
Allamber Springs Granite	63
Allia Creek Granite	3
Antrim Plateau Basalt	1
Bathurst Island Formation	1
Beatrice Granite	1
Beestons Formation	7
Big Sunday Formation	20
Birdie Creek Volcanic Member	11
Bludells Monzonite	23
Bludells Monzonite ?	1
Bonrook Granite	4
Burnside Granite	11
Burrell Creek Formation	66
Cahill Formation	286
Cahill Formation and interlayered Zamu	
Dolerite	1
Celia Dolomite	13
Coomalie Dolomite	23

Coronation Sandstone	145
Crater Formation	19
Douglas Leucogranite	7
Driffield Granite	4
Eva Valley Granite	1
Fenton Granite	6
Fingerpost Granodiorite	12
Fisher Creek Siltstone?	1
Foelsche Leucogranite	1
Frances Creek Leucogranite	10
Gerowie Tuff	32
Goodparla Dolerite	11
Grace Creek Granite	12
Ironbark Formation	1
Jammine Granite	6
Jim Jim Granite	23
Kapalga Formation	8
Kapalga Formation ?	2
Kombolgie Formation	52
Koolpin Formation	364
Koolpin Formation equivalent	1
Kudjumarndi Quartzite	1
Kurrundie Sandstone	13
Lewin Springs Syenite	13
Litchfield Granite	7
Malone Creek Granite	33
Maningkorri Phonolite	4
Margaret Granite	1
Masson Formation	51
McCarthy Granite	9
McKinlay Granite	2
McMinns Bluff Granite	32
Minglo Granite	13
Mount Basedow Gneiss	4
Mount Bonnie Formation	10
Mount Bunday Granite	6
Mount Davis Granite	2
Mount Goyder Syenite	2
Mount Howship Gneiss	2
Mount Porter Granite	3
Mudginberri Phonolite	8
Mundogie Sandstone	16
Murrakamangee Granite	1
Myra Falls Metamorphics	87
Nabarlek Granite	11
Nourlangie Schist	31
Oenpelli Dolerite	29
Plum Tree Creek Volcanics	34
Prices Springs Granite	8
Pul Pul Rhyolite	202
Pul Pul Rhyolite ?	7
Roberts Creek Granite	2
Saunders Leucogranite	8
Scinto Breccia	56
Shoobridge Granite	17
Shovel Billabong Andesite	20
Soldiers Creek Granite	1
Stag Creek Volcanics	35
Tabletop Granite	25

Tennysons Leucogranite	12
Tin Camp Granite	2
Tollis Formation	3
Two Sisters Granite	9
Umbrawarra Leucogranite	4
Undifferentiated	122
Unnamed dacite	1
Wagait Granite	4
Wandie Granite	1
Whites Formation	10
Wildman Siltstone	43
Wolfram Hill Granite	1
Wurugoiij Dolerite	3
Yenberrie Leucogranite	1
Zamu Dolerite	110
Zamu Dolerite ?	2
mixed Coronation Sandstone / Koolpin Formation	1
unnamed dolerite	1
unnamed intrusion	1
unnamed intrusive	9
unnamed porphyry	7
unnamed syenite	6

A1.4 Samples assigned to Stratigraphic Members.

STRATMEMBER	COUNT (*)
unassigned	2393
Acacia Gap Quartzite Member	1
Birdie Creek Volcanic Member	7
Marligur Member?	1
McAddens Creek Volcanic Member	4
Mount Callanan Volcanic Member	3
Nungbalgarri Volcanic Member	18
lower member	59
upper member	60

A1.5 Samples assigned by Rocktype.

ROCKNO	ROCKTYPE	COUNT (*)
2	felsic intrusive	489
4	mafic intrusive	121
5	felsic extrusive	250
6	intermediate extrusive	1
7	mafic extrusive	103
9	alkaline igneous	37
10	clastic sediment	623
11	chemical sediment	59
12	metabasite	51
13	felsic gneiss	109
14	metasediment	352
15	metasomatite	154
16	ore	16
17	regolith	174

A1.6 Samples assigned by Chronological Age.

AGE	COUNT (*)
unassigned	84
Archaean	51
Archaean/early Proterozoic	90
Cambrian	1
Cretaceous	1
Late Archaean	2
early Proterozoic	2294
late Archaean	9
late-middle Proterozoic	2
middle Proterozoic	13

A1.7 Samples assigned to 1:100 000 Map Sheet Areas.

MAPNAME	MAPNO	COUNT (*)
ANSON	4971	4
BATCHELOR	5171	108
BLYTH RIVER	5872	1
BYNOE	5072	18
CAHILL	5472	311
DALY RIVER	5070	12
EAST ALLIGATOR	5473	96
EVA VALLEY	5469	11
FERGUSON RIVER	5269	20
FIELD ISLAND	5373	5
FOG BAY	4972	1
GOOMADEER	5673	55
HOWSHIP	5572	10
JIM JIM	5471	104
KAPALGA	5372	32
KATHERINE	5369	28
LIVERPOOL	5672	2
MARY RIVER	5272	30
MCKINLAY RIVER	5271	23
MOYLE	4969	2
MUNDOGIE	5371	207
NOONAMAH	5172	21
OENPELLI	5573	147
PINE CREEK	5270	185
RANFORD HILL	5370	54
REYNOLDS RIVER	5071	44
STOW	5470	955
TIPPERARY	5170	48
WELLINGTON RANGE	5574	3
WINGATE MOUNTAINS	5069	1

A1.8 Samples assigned to Drillholes.

DRILLHOLE	COUNT (*)
unassigned	1864
BMR Cahill 1	4
BMR Cahill 11	2

BMR Cahill 12	1
BMR Cahill 13	1
BMR Cahill 14	1
BMR Cahill 16	1
BMR Cahill 17	1
BMR Cahill 18	1
BMR Cahill 19	1
BMR Cahill 2	1
BMR Cahill 20	1
BMR Cahill 21	1
BMR Cahill 22	1
BMR Cahill 24	1
BMR Cahill 25	1
BMR Cahill 26	1
BMR Cahill 28	1
BMR Cahill 29	1
BMR Cahill 3	2
BMR Cahill 30	2
BMR Cahill 31	1
BMR Cahill 32	1
BMR Cahill 33	1
BMR Cahill 34	1
BMR Cahill 36	1
BMR Cahill 37	1
BMR Cahill 4	2
BMR Cahill 41	1
BMR Cahill 43	2
BMR Cahill 44	1
BMR Cahill 46	1
BMR Cahill 47	1
BMR Cahill 48	1
BMR Cahill 49	1
BMR Cahill 5	3
BMR Cahill 50	1
BMR Cahill 53	1
BMR Cahill 54	1
BMR Cahill 55	1
BMR Cahill 57	1
BMR Cahill 58	1
BMR Cahill 59	2
BMR Cahill 6	6
BMR Cahill 60	1
BMR Cahill 61	1
BMR Cahill 62	1
BMR Cahill 64	1
BMR Cahill 65	1
BMR Cahill 66	1
BMR Cahill 67	1
BMR Cahill 68	1
BMR Cahill 69	1
BMR Cahill 7	2
BMR Cahill 70	1
BMR Cahill 71	1
BMR Cahill 72	1
BMR Cahill 73	1
BMR Cahill 74	1
BMR Cahill 75	1
BMR Cahill 76	1
BMR Cahill 77	1

BMR Cahill 8	1
BMR Cahill 9	1
BMR Cahill No.1	1
BMR Cahill No.3	1
BMR Cahill No.5	1
BMR Cahill no.1	6
BMR DDH1	2
BMR DDH10	1
BMR DDH11	1
BMR DDH4	4
BMR DDH6	1
BMR DDH7	1
BMR DDH8	1
BMR East Alligator 11	1
BMR East Alligator 12	1
BMR East Alligator 13	2
BMR East Alligator 15	1
BMR East Alligator 16	1
BMR East Alligator 17	1
BMR East Alligator 18	1
BMR East Alligator 2	4
BMR East Alligator 3	1
BMR East Alligator 5	1
BMR East Alligator 6	1
BMR East Alligator 9	1
BMR Field Island 1	1
BMR Field Island 12	1
BMR Field Island 14	1
BMR Field Island 4	1
BMR Field Island 8	1
BMR Jim Jim 1	1
BMR Jim Jim 10	1
BMR Jim Jim 13	1
BMR Jim Jim 14	1
BMR Jim Jim 15	1
BMR Jim Jim 16	1
BMR Jim Jim 17	1
BMR Jim Jim 18	1
BMR Jim Jim 2	1
BMR Jim Jim 20	1
BMR Jim Jim 23	1
BMR Jim Jim 24	1
BMR Jim Jim 25	2
BMR Jim Jim 26	1
BMR Jim Jim 28	1
BMR Jim Jim 3	2
BMR Jim Jim 30	1
BMR Jim Jim 31	1
BMR Jim Jim 32	1
BMR Jim Jim 34	1
BMR Jim Jim 36	1
BMR Jim Jim 37	1
BMR Jim Jim 38	1
BMR Jim Jim 39	1
BMR Jim Jim 40	1
BMR Jim Jim 41	1
BMR Jim Jim 42	1
BMR Jim Jim 43	1
BMR Jim Jim 44	1

BMR Jim Jim 47	1
BMR Jim Jim 48	2
BMR Jim Jim 50	1
BMR Jim Jim 53	1
BMR Jim Jim 54	1
BMR Jim Jim 55	1
BMR Jim Jim 56	1
BMR Jim Jim 57	1
BMR Jim Jim 58	1
BMR Jim Jim 59	1
BMR Jim Jim 60	1
BMR Jim Jim 61	1
BMR Jim Jim 62	1
BMR Jim Jim 63	1
BMR Jim Jim 64	1
BMR Jim Jim 65	1
BMR Jim Jim 66	1
BMR Jim Jim 67	1
BMR Jim Jim 68	1
BMR Jim Jim 69	1
BMR Jim Jim 7	2
BMR Jim Jim 70	1
BMR Jim Jim 8	1
BMR Jim Jim 9	1
BMR Kapalga 1	1
BMR Kapalga 11	1
BMR Kapalga 15	1
BMR Kapalga 17	1
BMR Kapalga 18	1
BMR Kapalga 2	1
BMR Kapalga 20	1
BMR Kapalga 21	1
BMR Kapalga 22	1
BMR Kapalga 24	1
BMR Kapalga 25	1
BMR Kapalga 26	1
BMR Kapalga 28	1
BMR Kapalga 3	1
BMR Kapalga 4	1
BMR Kapalga 5	1
BMR Kapalga 6	1
BMR Kapalga 7	1
BMR Mary River 1	18
BMR Mary River 6	1
BMR Mary River 7	2
BMR Mary River 9	1
BMR Mundogie 10	1
BMR Mundogie 11	1
BMR Mundogie 12	1
BMR Mundogie 13	1
BMR Mundogie 14	1
BMR Mundogie 16	1
BMR Mundogie 17	2
BMR Mundogie 18	1
BMR Mundogie 2	1
BMR Mundogie 21	1
BMR Mundogie 22	1
BMR Mundogie 23	1
BMR Mundogie 24	1

BMR Mundogie 25	1
BMR Mundogie 26	1
BMR Mundogie 27	1
BMR Mundogie 28	1
BMR Mundogie 29	1
BMR Mundogie 3	1
BMR Mundogie 30	1
BMR Mundogie 31	1
BMR Mundogie 32	2
BMR Mundogie 33	1
BMR Mundogie 35	1
BMR Mundogie 36	1
BMR Mundogie 39	1
BMR Mundogie 4	1
BMR Mundogie 41	1
BMR Mundogie 44	1
BMR Mundogie 45	1
BMR Mundogie 49	1
BMR Mundogie 5	1
BMR Mundogie 50	1
BMR Mundogie 51	1
BMR Mundogie 52	1
BMR Mundogie 53	1
BMR Mundogie 6	1
BMR Mundogie 7	1
BMR Mundogie 8	1
BMR Mundogie 9	1
BMR Pine Creek 1	1
BMR Pine Creek 10	1
BMR Pine Creek 11	1
BMR Pine Creek 13	1
BMR Pine Creek 14	1
BMR Pine Creek 15	1
BMR Pine Creek 16	1
BMR Pine Creek 17	1
BMR Pine Creek 18	1
BMR Pine Creek 19	1
BMR Pine Creek 2	1
BMR Pine Creek 20	1
BMR Pine Creek 21	1
BMR Pine Creek 22	1
BMR Pine Creek 23	1
BMR Pine Creek 24	2
BMR Pine Creek 25	1
BMR Pine Creek 26	1
BMR Pine Creek 27	1
BMR Pine Creek 28	1
BMR Pine Creek 29	1
BMR Pine Creek 3	2
BMR Pine Creek 31	1
BMR Pine Creek 32	1
BMR Pine Creek 33	1
BMR Pine Creek 36	1
BMR Pine Creek 37	1
BMR Pine Creek 39	1
BMR Pine Creek 4	1
BMR Pine Creek 40	1
BMR Pine Creek 46	1
BMR Pine Creek 48	1

BMR Pine Creek 49	1
BMR Pine Creek 5	1
BMR Pine Creek 51	1
BMR Pine Creek 52	1
BMR Pine Creek 55	1
BMR Pine Creek 56	1
BMR Pine Creek 6	1
BMR Pine Creek 61	1
BMR Pine Creek 8	1
BMR Rum Jungle 10	1
BMR Rum Jungle 14	2
BMR Rum Jungle 16	1
BMR Rum Jungle 19	1
BMR Rum Jungle 21	1
BMR Rum Jungle 22	1
BMR Rum Jungle 25	2
BMR Rum Jungle 28	1
BMR Rum Jungle 29	1
BMR Rum Jungle 30	1
BMR Rum Jungle 32	1
BMR Rum Jungle 33	1
BMR Rum Jungle 36	1
BMR Rum Jungle 37	2
BMR Rum Jungle 39	2
BMR Rum Jungle 40	1
BMR Rum Jungle 41	1
BMR Rum Jungle 42	1
BMR Rum Jungle 45	1
BMR Rum Jungle 46	1
BMR Rum Jungle 48	1
BMR Rum Jungle 5	1
BMR Rum Jungle 53	2
BMR Rum Jungle 55	2
BMR Rum Jungle 59	2
BMR Rum Jungle 6	1
BMR Rum Jungle 60	1
BMR Rum Jungle 61	1
BMR Rum Jungle 62	1
BMR Rum Jungle 63	1
BMR Rum Jungle 64	1
BMR Rum Jungle 67	2
BMR Rum Jungle 68	1
BMR Rum Jungle 69	1
BMR Rum Jungle 71	1
BMR Rum Jungle 73	1
BMR S Alligator Hole 2	20
BMR Shirley Area near	14
DDH 1	9
DDH 177	4
DDH 181	1
DDH 184	17
DDH 189	1
DDH 194	2
DDH 196	1
DDH 1A	1
DDH 1B	1
DDH 2	9
DDH 203	18
DDH 21	8

DDH 211	2
DDH 217	1
DDH 219	4
DDH 224	2
DDH 226	3
DDH 24	16
DDH 3	1
DDH 337	2
DDH 351	1
DDH 4	9
DDH 48	1
DDH 49	16
DDH 5	14
DDH 50	1
DDH 51-37	12
DDH 51-45	7
DDH 51-84	10
DDH 51-95	1
DDH 53-18	6
DDH 53-32	7
DDH 53-84	1
DDH 66-4	3
DDH 67-15	1
DDH 69-4A	1
DDH 69-5	3
DDH 7	1
DDH 8	3
DDH BMR 4	1
DDH HDH3	2
DDH NA23	3
DDH NA83	4
DDH QDH2	1
DDH STA	1
DDH STD	2
DDH226	1
DDH4 123m	2
Pancontinental GT5	32
Pancontinental GT6	15
Queensland Mines Na 19	4
Queensland Mines Na 23	7
Queensland Mines Na 35	4
Queensland Mines Na 41	6
Queensland Mines Na 47	12
Queensland Mines Na 94	3
Reserve No.275 Mary Ri	1

Appendix 2 - Rockchem Database Definitions.

A2.1 Samples Table Description:

```
CREATE SPACE DEFINITION SPACE_GCSAMPLES
```

```
    DATAPAGES    ( INITIAL      2000,
                  INCREMENT    500,
                  MAXEXTENTS  9999,
                  PCTFREE      25   )
    INDEXPAGES   ( INITIAL      200,
                  INCREMENT    100,
                  MAXEXTENTS  9999   )
```

```
    PARTITION C;
```

```
CREATE TABLE SAMPLES (
```

ORIGNO	NUMBER	(5,0)	NOT NULL,
SAMPNO	CHAR	(16)	NOT NULL,
FIELDNO	CHAR	(16),	
STRATGROUP	CHAR	(64),	
SUBGROUP	CHAR	(64),	
STRATUNIT	CHAR	(64),	
STRATMEMBER	CHAR	(64),	
STRATHEIGHT	NUMBER	(8,2),	
MAPSYMBOL	CHAR	(10),	
ROCKNO	NUMBER	(5,0),	
LITHOLOGY	CHAR	(64),	
GROUPING	CHAR	(22),	
AGE	CHAR	(64),	
REFNO1	NUMBER	(5,0),	
REFNO2	NUMBER	(5,0),	
REFNO3	NUMBER	(5,0),	
REFNO4	NUMBER	(5,0),	
REFNO5	NUMBER	(5,0),	
COUNTRYID	CHAR	(22),	
STATE	CHAR	(10),	
REGIONO	NUMBER	(5,0),	
GEOGAREA	CHAR	(64),	
LOCALITY	CHAR	(64),	
MAPNO	NUMBER	(5,0),	
AIRPHOTO	CHAR	(22),	
GRIDREF	CHAR	(10),	
DLAT	NUMBER	(8,6),	
NS	CHAR	(1),	
DLONG	NUMBER	(9,6),	
EW	CHAR	(1),	
DRILLHOLE	CHAR	(22),	
DEPTH	CHAR	(10),	
OTHERDATA	CHAR	(64),	
ENTRYDATE	DATE)

```
SPACE SPACE_GCSAMPLES;
```

```
CREATE UNIQUE INDEX ORIGSAMP ON SAMPLES ( ORIGNO, SAMPNO );
```

```
CREATE INDEX SAMPLENO ON SAMPLES ( SAMPNO );
```

```
CREATE INDEX REGIONS ON SAMPLES ( REGIONO );
```

```
CREATE          INDEX HMAPS ON SAMPLES ( MAPNAME );
```

A2.2 Samplesplits Table Description:

```
CREATE SPACE DEFINITION SPACE_GCSPLITS
  DATAPAGES    (  INITIAL      500,
                  INCREMENT    250,
                  MAXEXTENTS   9999,
                  PCTFREE      25    )
  INDEXPAGES    (  INITIAL      150,
                  INCREMENT    100,
                  MAXEXTENTS   9999  )

  PARTITION C;
```

```
CREATE TABLE SAMPLES (
  ORIGNO          NUMBER          (5,0)      NOT NULL,
  SAMPNO          CHAR            (16)        NOT NULL,
  SAMPTYPENO      NUMBER          (5,0)      NOT NULL,
  STOREBOXNO      NUMBER          (5,0)      )
SPACE SPACE_GCSPLITS;
```

```
CREATE INDEX SAMPORIG ON SAMPLESPLITS (  ORIGNO, SAMPLENO  );
CREATE INDEX SPLITYPE ON SAMPLESPLITS (  SAMPTYPENO  );
```

A2.3 Majors Table Description:

```
CREATE SPACE DEFINITION SPACE_GCMAJORS
  DATAPAGES    (  INITIAL      1000,
                  INCREMENT    400,
                  MAXEXTENTS   9999,
                  PCTFREE      10    )
  INDEXPAGES    (  INITIAL      200,
                  INCREMENT    100,
                  MAXEXTENTS   9999  )

  PARTITION C;
```

```
CREATE TABLE MAJORS (
  ORIGNO          NUMBER          (5,0)      NOT NULL,
  SAMPNO          CHAR            (16)        NOT NULL,
  ANALNO          NUMBER          (5,0)      NOT NULL,
  SOURCENO        NUMBER          (5,0),
  METHODNO         NUMBER          (5,0),
  SIO2            NUMBER          (4,2),
  TIO2            NUMBER          (4,2),
  AL2O3           NUMBER          (4,2),
  FE2O3TOT        NUMBER          (4,2),
  FE2O3           NUMBER          (4,2),
  FEO             NUMBER          (4,2),
  MNO             NUMBER          (4,2),
  MGO             NUMBER          (4,2),
  CAO             NUMBER          (4,2),
  NA2O            NUMBER          (4,2),
  K2O             NUMBER          (4,2),
  P2O5            NUMBER          (4,2),
  H2OPLUS         NUMBER          (4,2),
```

```

H2OMIN          NUMBER          (4,2),
CO2             NUMBER          (4,2),
LOI             NUMBER          (4,2),
REST            NUMBER          (4,2),
TOTAL           NUMBER          (5,2),
ENTRYDATE       DATE
SPACE SPACE_GCMAJORS;

CREATE UNIQUE INDEX MANALNO ON MAJORS ( ANALNO );
CREATE          INDEX MORIGSAMP ON MAJORS ( ORIGNO, SAMPNO );
CREATE          INDEX MSAMPLENO ON MAJORS ( SAMPNO );

```

A2.4 Traces Tables Description:

```

CREATE SPACE DEFINITION SPACE_GCTRACES
  DATAPAGES    ( INITIAL      1200,
                 INCREMENT    400,
                 MAXEXTENTS   9999,
                 PCTFREE      30  )
  INDEXPAGES    ( INITIAL      200,
                 INCREMENT    100,
                 MAXEXTENTS   9999  )
  PARTITION C;

CREATE TABLE TRACES  (
  ORIGNO        NUMBER          (5,0)          NOT NULL,
  SAMPNO        CHAR            (16)          NOT NULL,
  ANALNO        NUMBER          (5,0)          NOT NULL,
  SOURCENO      NUMBER          (5,0),
  METHODNO       NUMBER          (5,0),
  AG            NUMBER          (8,2),
  AL            NUMBER          (8,2),
  ARS           NUMBER          (8,2),
  AU            NUMBER          (8,2),
  B             NUMBER          (8,2),
  BA            NUMBER          (8,2),
  BE            NUMBER          (8,2),
  BI            NUMBER          (8,2),
  BR            NUMBER          (8,2),
  C             NUMBER          (8,2),
  CA            NUMBER          (8,2),
  CD            NUMBER          (8,2),
  CE            NUMBER          (8,2),
  CL            NUMBER          (8,2),
  CO            NUMBER          (8,2),
  CR            NUMBER          (8,2),
  CS            NUMBER          (8,2),
  CU            NUMBER          (8,2),
  DY            NUMBER          (8,2),
  ER            NUMBER          (8,2),
  EU            NUMBER          (8,2),
  F             NUMBER          (8,2),
  FE            NUMBER          (8,2),
  GA            NUMBER          (8,2),

```

GE	NUMBER	(8,2),
GD	NUMBER	(8,2),
HF	NUMBER	(8,2),
HG	NUMBER	(8,2),
HO	NUMBER	(8,2),
IR	NUMBER	(8,2),
K	NUMBER	(8,2),
LA	NUMBER	(8,2),
LI	NUMBER	(8,2),
LU	NUMBER	(8,2),
MG	NUMBER	(8,2),
MN	NUMBER	(8,2),
MO	NUMBER	(8,2),
NA	NUMBER	(8,2),
NB	NUMBER	(8,2),
ND	NUMBER	(8,2),
NI	NUMBER	(8,2),
OS	NUMBER	(8,2),
P	NUMBER	(8,2),
PB	NUMBER	(8,2),
PD	NUMBER	(8,2),
PR	NUMBER	(8,2),
PT	NUMBER	(8,2),
RB	NUMBER	(8,2),
S	NUMBER	(8,2),
SB	NUMBER	(8,2),
SE	NUMBER	(8,2),
SC	NUMBER	(8,2),
SI	NUMBER	(8,2),
SM	NUMBER	(8,2),
SN	NUMBER	(8,2),
SR	NUMBER	(8,2),
TA	NUMBER	(8,2),
TB	NUMBER	(8,2),
TE	NUMBER	(8,2),
TI	NUMBER	(8,2),
TH	NUMBER	(8,2),
TL	NUMBER	(8,2),
TM	NUMBER	(8,2),
U	NUMBER	(8,2),
V	NUMBER	(8,2),
W	NUMBER	(8,2),
Y	NUMBER	(8,2),
YB	NUMBER	(8,2),
ZN	NUMBER	(8,2),
ZR	NUMBER	(8,2),
ENTRYDATE	DATE)

SPACE SPACE_GCTRACES;

CREATE UNIQUE INDEX TANALNO ON TRACES (ANALNO);

CREATE INDEX TORIGSAMP ON TRACES (ORIGNO, SAMPNO);

CREATE INDEX TSAMPLENO ON TRACES (SAMPNO);

A2.5 ppb Table Description (elements in parts per billion):

```

CREATE SPACE DEFINITION SPACE_GSMALL
    DATAPAGES    ( INITIAL      50,
                  INCREMENT     50,
                  MAXEXTENTS    9999,
                  PCTFREE       25    )
    INDEXPAGES   ( INITIAL      20,
                  INCREMENT     12,
                  MAXEXTENTS    9999  )

    PARTITION C;

CREATE TABLE PPB    (
    ORIGNO          NUMBER          (5,0)          NOT NULL,
    SAMPNO          CHAR            (16)           NOT NULL,
    ANALNO          NUMBER          (5,0)           NOT NULL,
    SOURCENO        NUMBER          (5,0),
    METHODNO         NUMBER          (5,0),
    SE              NUMBER          (8,3),
    RB              NUMBER          (8,3),
    RU              NUMBER          (8,3),
    RH              NUMBER          (8,3),
    PD              NUMBER          (8,3),
    AG              NUMBER          (8,3),
    CS              NUMBER          (8,3),
    LA              NUMBER          (8,3),
    CE              NUMBER          (8,3),
    PR              NUMBER          (8,3),
    ND              NUMBER          (8,3),
    PM              NUMBER          (8,3),
    SM              NUMBER          (8,3),
    EU              NUMBER          (8,3),
    GD              NUMBER          (8,3),
    TB              NUMBER          (8,3),
    DY              NUMBER          (8,3),
    HO              NUMBER          (8,3),
    ER              NUMBER          (8,3),
    TH              NUMBER          (8,3),
    YB              NUMBER          (8,3),
    LU              NUMBER          (8,3),
    RE              NUMBER          (8,3),
    OS              NUMBER          (8,3),
    IR              NUMBER          (8,3),
    PT              NUMBER          (8,3),
    AU              NUMBER          (8,3),
    ENTRYDATE       DATE
)

CREATE UNIQUE INDEX PPBANALNO    ON PPB ( ANALNO );
CREATE          INDEX PPBORIGSAMP ON PPB ( ORIGNO, SAMPNO );
CREATE          INDEX PPBSAMPLENO ON PPB ( SAMPNO );

```

A2.6 Rocktypes Table Description:

```

CREATE SPACE DEFINITION SPACE_GSMALL
    DATAPAGES    ( INITIAL      50,
                  INCREMENT     50,

```

```

                                MAXEXTENTS 9999,
                                PCTFREE     25    )
INDEXPAGES  ( INITIAL         20,
              INCREMENT       12,
              MAXEXTENTS     9999 )
PARTITION C;

CREATE TABLE ROCKTYPES (
  ROCKNO          NUMBER          (5,0)      NOT NULL,
  ROCKTYPE        CHAR            (64)       NOT NULL )
SPACE SPACE_GCSMALL;

```

A2.7 References Table Description:

```

CREATE SPACE DEFINITION SPACE_GSMALL
  DATAPAGES  ( INITIAL         50,
              INCREMENT        50,
              MAXEXTENTS      9999,
              PCTFREE         25    )
INDEXPAGES  ( INITIAL         20,
              INCREMENT        12,
              MAXEXTENTS      9999 )
PARTITION C;

CREATE TABLE REFERENCES(
  REFNO          NUMBER          (5,0)      NOT NULL,
  OTHERID        CHAR            (16)
  USERNAME       CHAR            (16)
  AUTHORS        CHAR            (128)
  YEAR           CHAR            (16)
  TITLE          CHAR            (240)
  SOURCE         CHAR            (240)      )
SPACE SPACE_GCSMALL;

CREATE UNIQUE INDEX REFNUMBER ON REFERENCES ( REFNO );
CREATE UNIQUE INDEX REFUNIQUE ON REFERENCES ( AUTHORS, YEAR );

```

A2.8 Originators Table Description:

```

CREATE SPACE DEFINITION SPACE_GSMALL
  DATAPAGES  ( INITIAL         50,
              INCREMENT        50,
              MAXEXTENTS      9999,
              PCTFREE         25    )
INDEXPAGES  ( INITIAL         20,
              INCREMENT        12,
              MAXEXTENTS      9999 )
PARTITION C;

CREATE TABLE ORIGINATORS (
  ORIGNO          NUMBER          (5,0)      NOT NULL,
  ORIGINATOR      CHAR            (22)       NOT NULL )
SPACE SPACE_GCSMALL;

CREATE UNIQUE INDEX ORIGNOS ON ORIGINATORS ( ORIGNO );

```

```
CREATE UNIQUE INDEX ORIGINS ON ORIGINATORS ( ORIGNATOR );
```

A2.9 Regions Table Description:

```
CREATE SPACE DEFINITION SPACE_GSMALL
```

```

    DATAPAGES    (  INITIAL      50,
                   INCREMENT    50,
                   MAXEXTENTS  9999,
                   PCTFREE     25    )
    INDEXPAGES   (  INITIAL      20,
                   INCREMENT    12,
                   MAXEXTENTS  9999  )

    PARTITION C;
```

```

CREATE TABLE REGIONS (
    REGIONO          NUMBER          (5,0)          NOT NULL,
    REGION           CHAR            (64)           NOT NULL )
SPACE SPACE_GCSMALL;
```

```

CREATE UNIQUE INDEX REGIONO    ON REGIONS ( REGIONO );
CREATE UNIQUE INDEX REGIONAME ON REGIONS ( REGION );
```

A2.10 HMAPS Table Description:

```
CREATE SPACE DEFINITION HMAPS
```

```

    DATAPAGES    (  INITIAL      50
                   INCREMENT    10
                   MAXEXTENTS  9999,
                   PCTFREE     10    )
    INDEXPAGES   (  INITIAL      20
                   INCREMENT    10
                   MAXEXTENTS  9999  )

    PARTITION C;
```

```

CREATE TABLE HMAPS (
    HMAPNO          NUMBER          (4,0)
    HMAPID          CHAR            (4)
    QMAPNO          NUMBER          (2,0)
    N_LAT           NUMBER          (3,1)
    W_LONG          NUMBER          (4,1)
    MEAST           NUMBER          (6)
    MNORTH          NUMBER          (7)
SPACE SP_LOCAL
```

```

CREATE UNIQUE INDEX HMAPNO     ON HMAPS ( HMAPNO );
CREATE          INDEX HMAPNAME ON HMAPS ( HMAPNAME );
CREATE          INDEX NLAT     ON HMAPS ( N_LAT );
CREATE          INDEX WLONG    ON HMAPS ( W_LONG );
```

A2.11 Sampletypes Table Description:

```
CREATE SPACE DEFINITION SPACE_GSMALL
```

```

    DATAPAGES    (  INITIAL      50,
                   INCREMENT    50,
                   MAXEXTENTS  9999,
                   PCTFREE     25    )
    INDEXPAGES   (  INITIAL      20,
```

```

                INCREMENT      12,
                MAXEXTENTS    9999 )
PARTITION C;

CREATE TABLE SAMPLETYPES (
    SAMPLETYPENO      NUMBER      (5,0)      NOT NULL,
    SAMPLETYPE        CHAR        (64)       NOT NULL )
SPACE SPACE_GCSMALL;

```

A2.12 Sources Table Description:

```

CREATE SPACE DEFINITION SPACE_GSMALL
    DATAPAGES    ( INITIAL      50,
                  INCREMENT     50,
                  MAXEXTENTS    9999,
                  PCTFREE       25 )
    INDEXPAGES   ( INITIAL      20,
                  INCREMENT     12,
                  MAXEXTENTS    9999 )
PARTITION C;

CREATE TABLE SOURCES (
    SOURCENO      NUMBER      (5,0)      NOT NULL,
    SOURCE        CHAR        (64)       NOT NULL )
SPACE SPACE_GCSMALL;

CREATE UNIQUE INDEX SOURCENOS ON SOURCES ( SOURCENO );
CREATE UNIQUE INDEX SOURCES ON SOURCES ( SOURCE );

```

A2.13 Methods Table Description:

```

CREATE SPACE DEFINITION SPACE_GSMALL
    DATAPAGES    ( INITIAL      50,
                  INCREMENT     50,
                  MAXEXTENTS    9999,
                  PCTFREE       25 )
    INDEXPAGES   ( INITIAL      20,
                  INCREMENT     12,
                  MAXEXTENTS    9999 )
PARTITION C;

CREATE TABLE SOURCES (
    SOURCENO      NUMBER      (5,0)      NOT NULL,
    SOURCE        CHAR        (64)       NOT NULL )
SPACE SPACE_GCSMALL;

CREATE UNIQUE INDEX METHODNO ON METHODS ( METHODNO );
CREATE UNIQUE INDEX METHOD ON METHODS ( METHOD );

```

A2.14 Storeboxes Table Description:

```

CREATE SPACE DEFINITION SPACE_GSMALL
    DATAPAGES    ( INITIAL      50,
                  INCREMENT     50,
                  MAXEXTENTS    9999,
                  PCTREE        25 )
    INDEXPAGES   ( INITIAL      20,

```

```

                INCREMENT    12,
                MAXEXTENTS   9999 )
PARTITION C;

CREATE TABLE SOURCES (
    SOURCENO          NUMBER      (5,0)      NOT NULL,
    SOURCE            CHAR        (64)        NOT NULL )
SPACE SPACE_GCSMALL;

CREATE UNIQUE INDEX STOREBOXNOS ON STOREBOXES ( BOXNO );

```

A2.15 Maxnos Table Description:

```

CREATE SPACE DEFINITION SPACE_GSMALL
    DATAPAGES    ( INITIAL      50,
                  INCREMENT     50,
                  MAXEXTENTS    9999,
                  PCTFREE       25 )
    INDEXPAGES   ( INITIAL      20,
                  INCREMENT     12,
                  MAXEXTENTS    9999 )
PARTITION C;

CREATE TABLE SOURCES (
    SOURCENO          NUMBER      (5,0)      NOT NULL,
    SOURCE            CHAR        (64)        NOT NULL )
SPACE SPACE_GCSMALL;

```