Woodcutters

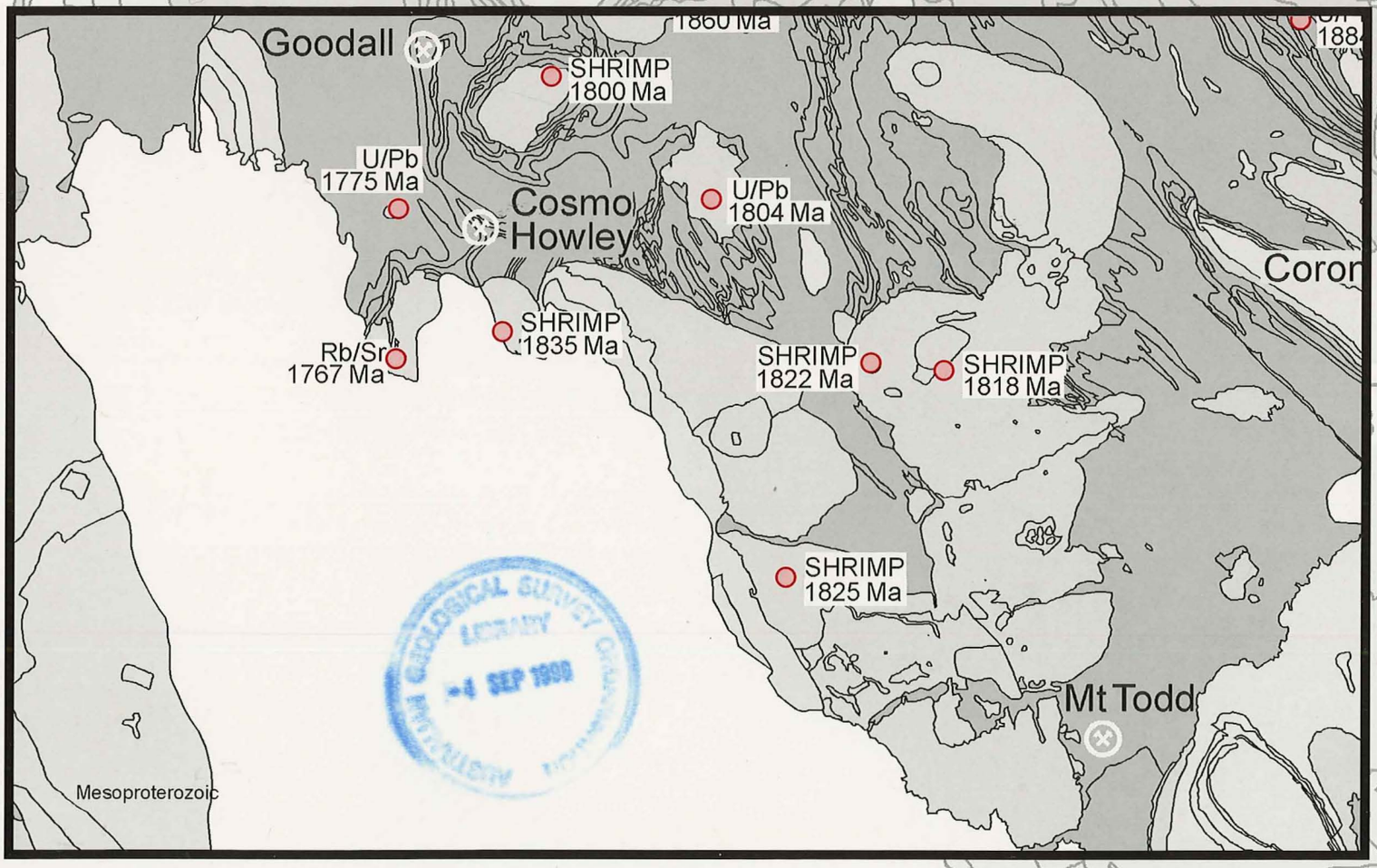
Batchelor

AGSO
AUSTRALIAN GEOLOGICAL SURVEY ORGANISATION

OZCHRON DOCUMENTATION

AGSO's national geochronology database

AGSO RECORD 1996/6



by R.W. Page, L.P. Black, S-S. Sun, B. Kilgour,
M. Hazell, L.A.I. Wyborn, and R.J. Ryburn

AGSO's National Geochronology Database of Australia

OZCHRON Dataset Documentation

AGSO Record 1996/6

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DEPARTMENT OF PRIMARY INDUSTRIES AND ENERGY

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AUSTRALIAN GEOLOGICAL SURVEY ORGANISATION

Executive Director: Neil Williams

ISSN: 1039-0073
ISBN: 0 642 24972 5

Section 1—The structure of the OZCHRON Database

1.1 Introduction

OZCHRON is the geochronological data storage and retrieval system of the Australian Geological Survey Organisation (AGSO). It is a dynamic database that will be continuously updated as volume, variety and quality of geochronological data increase.

Geochronological information on Australian Precambrian and Phanerozoic terranes has been generated over more than 30 years, and the data in OZCHRON have been compiled from a variety of published and unpublished sources. Unpublished ages and interpretations acquired by AGSO under co-operative agreements are also included. OZCHRON summarises the analytical data and resultant ages, and acknowledges the primary source of the data. Comments are also included on the geological relevance and reliability of those ages.

This manual describes the structure of OZCHRON and the purpose of the individual fields. Listings of authority table contents are also included, as well as a complete data dictionary for all tables. The manual has been prepared on the assumption that the purchaser is setting up their own database. In AGSO, OZCHRON is implemented under Oracle's relational database management system running under the UNIX operating system on a DG AViiON computer. Those purchasers who acquire the database in ORACLE format may also find useful an AGSO in-house Record by Ryburn, R.J., Page, R.W., & Richards, J.R. 1993, 'User's guide to the OZCHRON database'. *AGSO Record* 1993/11.

This manual has been prepared in loose leaf format so that descriptive data on additional releases, or on new methods can easily be added.

1.2 Structure of OZCHRON

OZCHRON is part of a system of databases (Figure 1.1) set up for the National Geoscience Mapping Accord (NGMA) (Blewett, R. 1993, The NGMA Field Databases-a field guide. *AGSO Record* 1993/46). The central component of these databases is the OZROX Field Geology Database (Figure 1.2) which records all sample attribute data (e.g., location, stratigraphic formation, lithology, etc.). A useful guide to OZROX is the in house record, Ryburn, R.J., Bond, L.D. and Hazell, M.S. 1995, Guide to OZROX AGSO's Field Geology Database).

The OZCHRON database comprises eight main tables for analytical and derived age information for four age determination methods, Rubidium-Strontium (Rb-Sr), Uranium-Lead conventional (U-Pb), Sensitive High Resolution Ion MicroProbe (SHRIMP) Uranium-Lead and Samarium-Neodymium (Sm-Nd). Each age determination can be related back to attribute and locational data in the OZROX database (Figure 1.3), or to information in other databases (e.g., whole rock geochemistry in the the ROCKCHEM database) (Figure 1.1). OZCHRON table names and their contents are listed in table 1.1, with the main OZROX tables. Authority or lookup tables are used by OZROX and OZCHRON to supply standard values for many fields. These are listed in table 1.2. Some of these authority tables are combined as database Views, which are listed in table 1.3. The scripts for creating the views are included in the data dictionary in section 4.

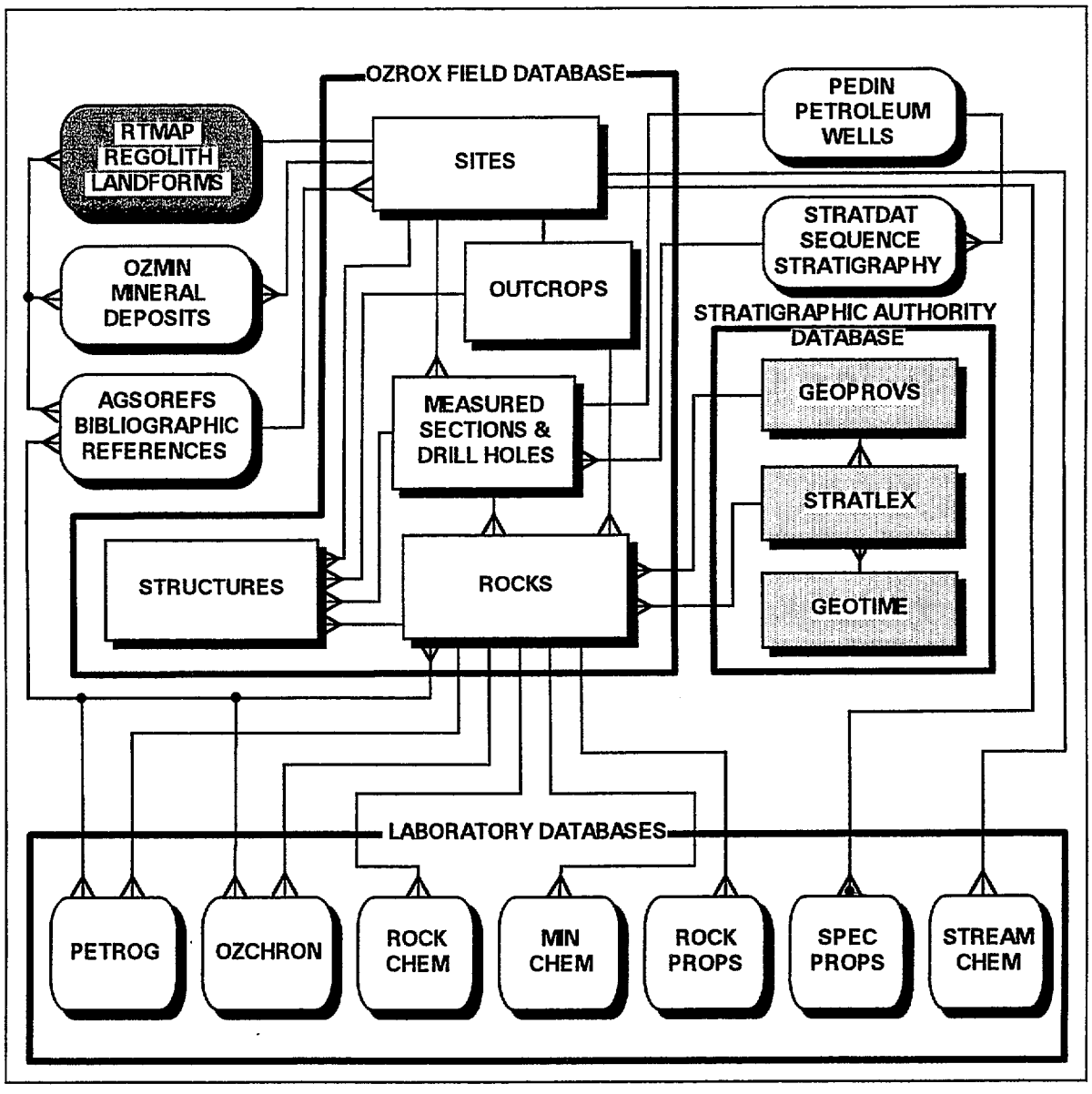

Figure 1.1 A schematic diagram of AGSO's field and laboratory databases showing the relationships between component databases and tables. OZCHRON is one of AGSO's laboratory databases. Locational, lithological and stratigraphic data for samples are accessed through the ROCKS table. The "crows" feet on the lines joining tables indicate the many side of many-to-one links.

Each geochronological method covered by the OZCHRON database employs one or two tables of geochronological data (Figure 1.3). Where a number of analytical results are required to arrive at one age determination, as in Rb-Sr whole-rock isochron work, there are two tables, one for analytical results and one for the pooled age result and interpretation. The analytical results are joined to a pooled-result table by a Foreign Key field, called AGE_POINTER or RECNO depending on the table.

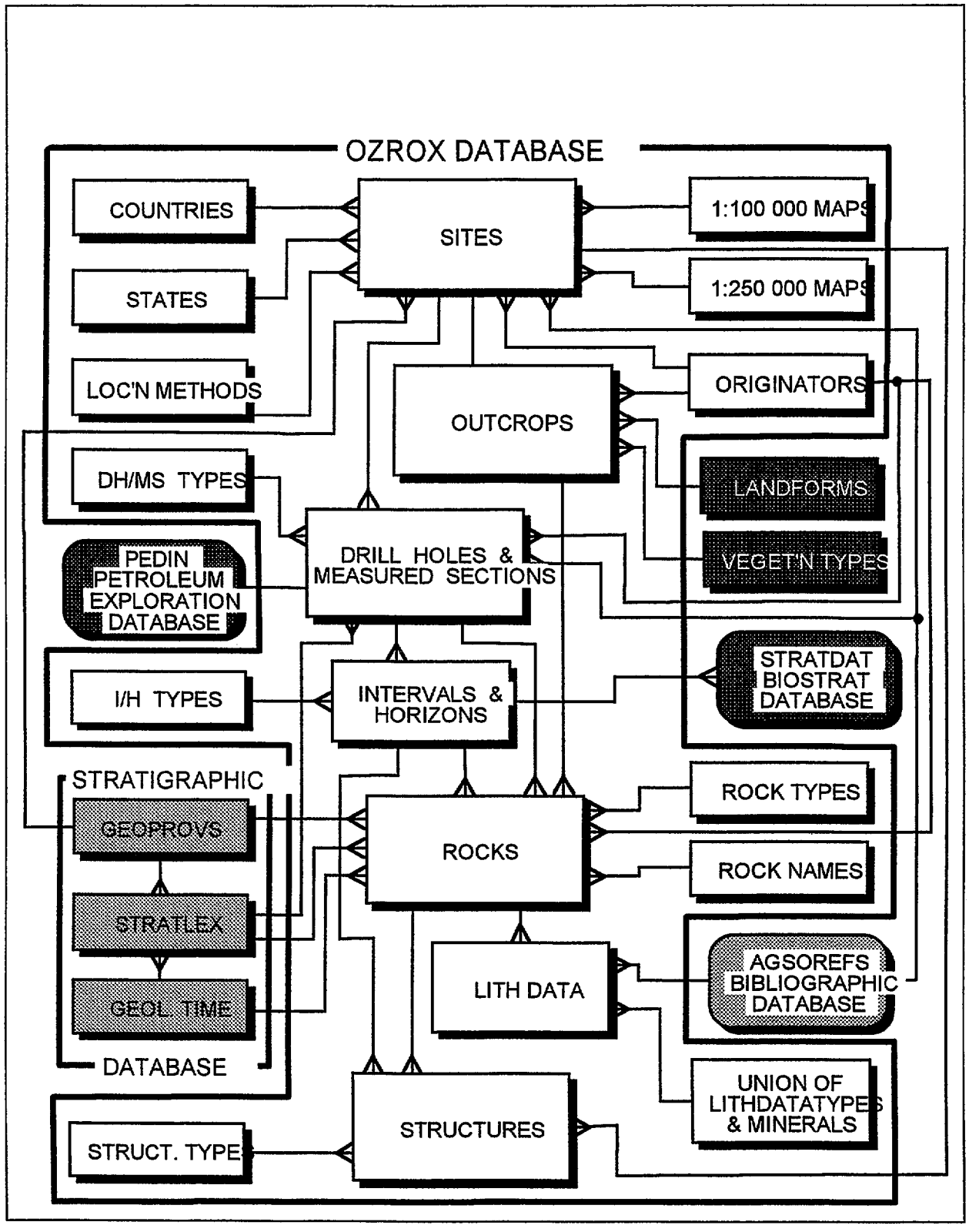

Figure 1.2 A schematic diagram of the OZROX database showing the relationships between component tables and some other AGSO field databases. The "crows" feet on the lines joining tables indicate the many side of many-to-one links.

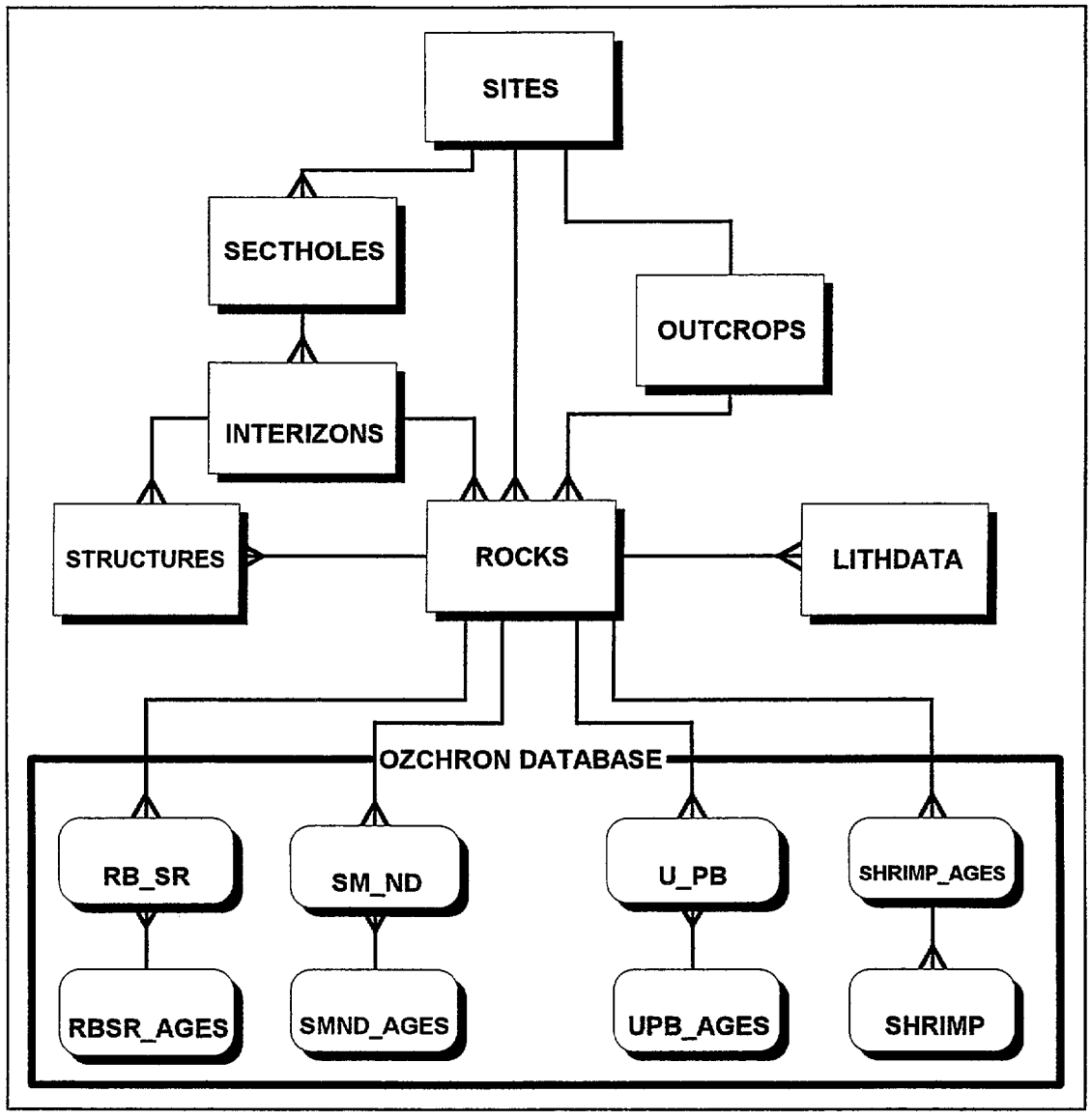

Figure 1.3 A schematic relationship diagram showing the relationships between the OZCHRON tables and the OZROX Field Geology Database. The "crows" feet on the lines joining the tables indicate the many side of many-to-one links.

OZCHRON data can be joined to the sample information in OZROX (Figure 1.2) by a combined primary key on the originator number (ORIGNO) plus sample number (SAMPLEID). The originator is the person/organisation responsible for collecting the sample and/or publishing the results, while the sample number can be any combination of numbers or characters up to 16 characters long.This dual primary key allows published sample numbers to be preserved and obviates the need for an additional numbering system. The only requirement is that the sample numbers from any one originator must be unique within his or her numbering system. OZCHRON data can also be joined to OZROX using the originator number (ORIGNO) plus site Id (SITEID). However while this combination is unique for any site information if more than one sample has been collected at a site then the correct lithology description for the age determination can only be derived using the sample number.

A sample in OZCHRON is therefore fully identified only by a combination of **Originator Number** (ORIGNO) and **Sample Number** (SAMPLEID) A **Sample Number** on its own is usually sufficient to retrieve the required sample, but do not forget that duplicate **Sample Numbers** are permitted if the originators are different.

With the exception of the SHRIMP table, all analytical tables record both **Originator Number, Sample Number** and **Site ID**. For SHRIMP data these are found only in the SHRIMP_AGES table (Figure 1.3).

Table Name	*Contents*
SITES	Individual site location data, accuracy and lineage
OUTCROPS	Outcrop-scale data
ROCKS	Stratigraphic and lithological data for individual samples
LITHDATA	Extendable lithological attribute table for rocks
SECTHOLES	Drill hole or measured section name, and type
INTERIZONS	Drill hole or measured section interval information
STRUCTURES	Structural data for rock or drill hole descriptions
RB_SR	Rubidium-Strontium analytical data
RBSR_AGES	Rubidium-Strontium pooled results
U_PB	Uranium-Lead mineral analytical data
UPB_AGES	Uranium-Lead mineral pooled results
SHRIMP	Uranium-Lead ion microprobe analytical data
SHRIMP_AGES	Uranium-Lead ion microprobe pooled results
SM-ND	Samarium-Neodymium analytical data
SMND_AGES	Samarium-Neodymium pooled results

Table 1.1. List of the main tables in OZCHRON

Table Name	*Contents*
AGSOCOUNTRIES	Valid country codes
AGSOSTATES	Valid states of Australia codes
GEOPROVS	Valid geological provinces
HMAPS	Australian 1:100 000 map names and four digit codes
QMAPS	Australian 1:250 000 map names and six character codes
AGSOREFS	References in AGSO's bibliographic database
AGSOAUTHS	Authors of references in the bibliographic database
LOCMETHODS	Methods used for locating field sites
ORIGINATORS	Originators and collectors of the samples
LANDF	Landform types
VEGET	Vegetation types
GEOTIME	Geological time terms
ROCKTYPES	17 broad lithology categories
LITHOLOGIES	Rock names and qualifiers
LITHDATATYPES	Lithological data descriptors
STRUCTYPES	Structural data types
STRATRELS	Stratigraphic Relationships
GEOREGIONS	Geological regions
AGSOMINERALS	Minerals
STRATSTATUS	Status of stratigraphic units
SOURCES	Laboratory or organisation which analysed the sample
METHODS	Analytical methods used in deriving the analyses
STRATRANK	Ranks of stratigraphic units
CONTACTS	Geological contact types
IZ_RECTYPES	List of record types for the INTERIZONS table
SECTYPES	Type of measured section
PROVRANKS	Ranks of geological provinces
TIMESCOPE	The geographical scope of a geological time range
TIMERANK	Ranking terms for the geological time ranges
TIMESTATUS	Status of geological time range
LITHUNITS	Map symbols for regions with no formal stratigraphy
MEAN_METHOD	Methods used to calculate the mean for SHRIMP age determinations
COMMON_PB	Lead isotopes used for correcting for common lead
AGE_USED	Isotope ratios used for SHRIMP age determinations

Table 1.2. List of the authority tables in OZCHRON

View Name	*Underlying Tables*
ROCKDATATYPES	LITHDATATYPES and AGSOMINERALS
LITHNAMES	LITHOLOGIES and AGSOMINERALS
STRATLEX	Current stratigraphic names from the Australian Register of Stratigraphic Names

Table 1.3 List of database views and their underlying tables

Section 2—Descriptions of the main tables used in OZCHRON

2.1 – THE SITES TABLE

The SITES table standardises the recording of geographic point location data in AGSO's corporate databases. The table is mainly for surface location data for field geological, geochemical, drill hole collars and geophysical observations. For example, an entry in the SITES table may record location data for observations at an outcrop, sample(s) data, a gravity reading, or all three. Geographic coordinates are recorded as decimal latitudes and longitudes, and AMG eastings and northings. Information is also recorded on how the location was obtained and its accuracy.

The Primary Key for the SITES table is a combination of the origno and siteid fields.

Description of columns

ORIGNO: Mandatory integer of up to 5 digits. The originator is represented by this number and their full name is stored in the related ORIGINATORS table. The originator is usually the person or organisation that collected the data at the site, and is also an indication of where to go for more information.

SITEID: Mandatory field of up to 16 characters for a user-supplied number or ID for the site. Any combination of numbers and letters is used, but the Site ID must be unique to the originator. There may be more than one sample collected from each site but only one sites record is recorded in the SITES table. The multiple sample descriptions for each site are stored as multiple records in the ROCKS table each identified by a unique Sample ID.

FIELDID: An optional field of up to 16 characters for an alternative site number or ID. The field ID is not necessarily unique.

OBSDATE: The date the field site was visited or observed - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

OBSTIME: The time the field site was observed - in Oracle's 24-hour format of HH:MM - e.g. '14:47'.

COUNTRYID: Mandatory 3 capital characters indicating the country. Valid codes are stored in the AGSOCOUNTRIES authority table.

STATE: A field of up to 3 capital characters indicating the State. Mandatory if the country is Australia. Valid codes are stored in the AGSOSTATES authority table.

REGNO: A field of up to 5 integers indicating the geological region. Mandatory if the country is Australia. Valid entries are stored in the GEOREGIONS authority table. Geological regions are based on Palfreyman's Geological provinces (see Palfreyman, 1984). The Geological region is similar to the geological province however it only represents the two-dimensional geographical region in which the sample was collected. Geological regions therefore cater for situations that can occur with drill holes which are, for example, collared in the Cainozoic Karumba Basin and extend into an underlying Proterozoic basement. The

sample site is in the Karumba Basin while the samples belonging to that site may be from the Karumba Basin or the Proterozoic basement.

GEOGAREA: An optional descriptive field of 64 characters for the name of the geographic area (valley, plain, mountain range) from which the sample comes e.g., Newcastle Ranges, Tuggeranong Valley.

LOCDESC: An optional descriptive field of 64 characters for additional information relating to the site's location - e.g., '5 km SE of Brown's Bore'. Locality information available from much of the earlier published geochemical literature is commonly imprecisely or poorly described. Hence there are a number of instances in the ROCKCHEM database where point locations are interpolated or based on an educated guess.

HMAPNO: A 4-digit integer identifying the 1:100 000 map sheet-area on which the site falls. The name of the map sheet is stored in the HMAPS authority table.

QMAPID: The 6-character ID of the 1:250 000 map sheet-area on which the site falls - e.g., 'SF5402'. The name is stored in the QMAPS authority table. The first four characters identify the 1:1 000 000 map, and the first two letters in the ID give the UTM zone.

EASTING: A 6-digit positive numeric field for the full AMG easting of the site in metres, but up to two decimal places may be entered (a precision of +/- 1.0 cm on the ground which is rarely achieved but allows precisely surveyed samples or drill collars to be recorded to their full surveyed precision).

NORTHING: A 7-digit positive numeric field for the full AMG northing of the site in metres, but up to two decimal places may be entered (a precision of +/- 1.0 cm on the ground which is rarely achieved but allows precisely surveyed samples or drill collars to be recorded to their full surveyed precision).

ACCURACY: A mandatory integer field of up to 5 digits for the absolute accuracy of the given coordinates in metres on the ground. Data transferred from the pre-1992 SAMPLES table, which stored locality information associated with earlier versions of the ROCKCHEM database, did not include accuracy estimates. The following assumptions were therefore made in translating these results to the SITES table.

1 - Unless otherwise known, it is assumed that all geographic coordinates were obtained from 1:100 000-scale maps, and were therefore accurate to about 100 metres.

2 - Results known to have been measured only from 1:250 000-scale maps are assumed accurate to 250 metres.

3 - Other approximately known localities have had their accuracies appropriately estimated at distances up to 10 km.

HEIGHT: An integer with up to 5 digits for the elevation of the site in metres above mean sea level. Can be negative.

HEIGHTACC: A positive integer of up to 3 digits for the absolute error in metres of the elevation entered in the previous field.

DLAT: A positive numeric field with up to 2 digits in front of the decimal point, and up to 6 digits after the decimal point.

NS: A single character field that can only take the values 'N', 'n', 'S' or 's' for northern hemisphere or southern hemisphere, respectively. The value in this field is automatically set to a capital 'S' when a latitude is entered. However if the latitude has been calculated from the AMG Northing then the default will be a lower case 's'.

DLONG: A positive numeric field with up to 3 digits in front of the decimal point and up to 6 digits after the decimal point.

EW: A single character field that can only take the values 'E', 'e', 'W' or 'w' for east or west, respectively. The value in this field is automatically set to a capital 'E' when a longitude is entered. However if the longitude has been calculated from the AMG Easting then the default will be a lower case 'e'.

METHOD: A mandatory integer of up to 3 digits pointing to a record in the LOCMETHODS authority table showing the method used to obtain the geographic coordinates of the site.

BIBREF: A 9-character field that identifies a reference in AGSOREFS, AGSO's Bibliographic References Database, which locates or refers to the site. The reference could be a locality diagram in a publication, a non-standard published map or a map from a PhD thesis or company report. This column is provided principally as a means of recording the lineage or provenance of data that have come from another source. Note that almost any map can be treated as a bibliographic reference using the standard 'Harvard-style' of reference notation. A future user of the SITES table can then refer to this map to do their own assessment of the accuracy of the geographic coordinates.

AIRPHOTO: An optional field of 36 characters to identify the airphoto on which the site is located and/or was plotted. The field is for the name of the airphoto series, the run number and the photo number - e.g. 'Cloncurry 8/2134'.

Related Data Sets: Twelve single character fields that show what data sets join to the site. Only two values are allowed, null or capital 'X' - the 'X' being placed in all fields with related data sets. The field names are as follows:

OC	OUTCROPS table
ST	STRUCTURES table
RO	ROCKS table
PE	PETROGRAPHY database
RC	ROCKCHEM database
OZ	OZCHRON database
OM	OZMIN database
SC	STREAMCHEM database
RT	RTMAP database
RP	ROCKPROPS database
SP	SPECPROPS database
SH	SECTHOLES database
RS	ROCSTOR database

ENTRYDATE: The date the site description was entered - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

LASTUPDATE: The date of the last update - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTEREDBY: An 8-character field for the username of the person who entered the data. This column is used by AGSO's Oracle system to identify the records to which a user has update privileges. Users are therefore only able to update the records which belong to them, or to which they have been granted explicit access.

2.2 – THE OUTCROPS TABLE

The OUTCROPS table is designed for descriptions of the outcrop as a whole and for describing relationships between lithologies and structures in the outcrop. Information on individual lithologies, samples and structures belongs in the ROCKS and STRUCTURES tables - both of which have a many-to-one relationship with OUTCROPS. The OUTCROPS table has a one-to-one relationship with the SITES table, and uses the same primary key covering the Originator (origno) and Site-ID (siteid). The reason for the separation is that tables other than OUTCROPS need to link in with the location information in SITES.

The Primary Key for the OUTCROPS table is a combined key on origno and siteid.

Description of columns

ORIGNO: As for the SITES table.

SITEID: As for the SITES table.

ROCKRELS: An optional field of 128 characters for a description of the rock relations in the outcrop.

SKETCH: An optional field of 64 characters noting any sketches made at the outcrop.

PHOTO: An optional field of 64 characters noting any photos taken at the outcrop.

VEGCODE: An optional field of up to 5 characters for the vegetation type in AGSO's vegetation types authority table (VEGET). Vegetation classes in this are based on legend from AUSLIG's 1:5 000 000 Vegetation Map of Australia.

VEGETATION: An optional 64 character field for a text description of the vegetation at the site of the outcrop. Important for remote sensing database.

LANDCODE: An optional field of up to 4 characters for the landform in AGSO's landforms authority table (LANDF). Landform classes in the LANDF table are based on the `Australian Soil and Land Survey Handbook' by Gunn, R.H., Beattie, J.A., Reid, R.E., and van der Graff, R.H.M., 1988, Inkata Press, Melbourne.

LANDFORM: An optional 64 character field for a text description of the landform at the site of the outcrop.

ENTRYDATE: As for the SITES table.

ENTEREDBY: As for the SITES table

2.3 – THE 'ROCKS' TABLE

The ROCKS table has a many-to-one relationship with the SITES table, and also with the OUTCROPS table if an outcrop record exists for a site. This is a natural relationship as a number of different lithologies and samples commonly occur at the one site.

The Primary Key for the ROCKS table is rockno.

Description of columns

ROCKNO: A unique sequential number of up to 5 digits which links attributes in the LITHDATA, STRUCTURES and INTERIZONS tables to records in the ROCKS table.

ORIGNO: As for the SITES and OUTCROPS tables.

SITEID: As for the SITES and OUTCROPS tables except that the Origno and Site-ID, combined, are no longer a unique key. This is because there can be more than one record in the ROCKS table for a particular SITE record.

SAMPLEID: A mandatory field of up to 16 characters for the ID of a sample. The number must be unique to the Originator, although it can be identical to the Site-ID, if there is only one sample from a given site.

ROCKTYPE: A positive integer of up to two digits that identifies the basic rock type from the ROCKTYPES authority table. This field is designed to allow easy selection of all samples of a particular rock type (e.g., intrusive mafic rocks, clastic sediments, felsic gneisses).

QUALIFIER: A 20-character optional field for a qualifying term, if any, before the Lithology Name field that follows. Up to three qualifiers, one in each qualifier field, are allowed for each lithology name. The qualifying term must be in the LITHNAMES view, which is a view on the LITHOLOGIES authority table and the common minerals from the AGSOMINERALS authority table. Qualifiers in the LITHNAMES view are classified as Type 'Q' for qualifier. An example of a qualifier is 'pelitic', as in 'pelitic schist'.

QUALIFIER2: A 20-character optional field for a second qualifying term for the lithology name. A qualifier can only be entered into this column after a first qualifier has been entered into the qualifier column above.

QUALIFIER3: A 20-character optional field for a third qualifying term for the lithology name. A qualifier can only be entered into this column after first and second qualifiers have been entered into the qualifier and qualifier2 columns above. The correct representation of the qualifier columns to lithname is always: qualifier3, qualifier2, qualifier, lithname. Table 2.1 below shows the relationship between the three Qualifier columns and the Lithname column, and the order in which they should always be represented.

QUALIFIER3	QUALIFIER2	QUALIFIER	LITHNAME
		micaceous	sandstone
			tonalite
foliated	plagioclase	hornblende	tonalite
	coarse	hornblende	granodiorite
coarse	foliated	plagioclase	granodiorite
coarse	pyroxene	plagioclase	gabbro
		foliated	granite

Table 2.1: This table shows the relationship between the three Qualifier columns and the Lithname column, and the order in which they should always be represented. A value cannot be entered into the Qualifier2 column until a value has been entered into the Qualifier column. Likewise a value cannot be entered into Qualifier3 column unless there are values in the Qualifier2 and Qualifier columns.

LITHNAME: A 32-character field for a lithology name. Only names already in the LITHOLOGIES authority table and classified as Type 'I', 'M', 'S' or 'H' (igneous, metamorphic, sedimentary, hybrid) may be entered into the Lithname field. The hybrid classification has been introduced to cater for non-specific lithology names, e.g. breccia, which can be sedimentary, volcanic or tectonic. Hybrid names must always be preceded by a qualifier.

GROUPING: A 22-character optional field for a user-defined classification. This field is used to classify suites of rocks from particular regions into classes other than those suggested by other fields on the form. The values entered here are chosen by the Originator and have no global significance.

STRATNO: A positive integer of up to 5 digits that automatically identifies the formal stratigraphic name, and age from the STRATLEX authority view of current stratigraphic names from the Australian Register of Stratigraphic Names.

INFORMAL: Optional free-text field of 64 characters for an informal stratigraphic name, which is not in AGSO's STRATLEX authority view. Due to ongoing updating of the Australian Register of Stratigraphic Names some of the names currently entered in the informal field may now be current formal names in STRATLEX. From time to time AGSO runs checks on the informal field to identify names which should be in the stratno field. Purchasers of Rockchem can view the current status of stratigraphic names online via the AGSO home page on the world wide web. This page also displays the history of the name showing all previous and superseded names and terms. The web address for the AGSO home page is: http://www.agso.gov.au/

AGE: Optional free-text field of 54 characters for the geological age (e.g., Proterozoic, Archaean). Only age terms in the GEOTIME authority table may be entered.

DESCRIPTION: A 64-character optional free-text field for a description of the lithology. If a lithology is sufficiently characterised by the previous fields, then this field can be used for additional descriptive information relating to the lithology.

OTHERINFO: A 64-character optional free-text field that may be used for any data not covered by the above fields that the user feels are relevant.

GEOLPROVNO: An integer of up to 3 digits for the geological province, subprovince or domain in which the sample occurs. Valid codes must be in the GEOPROVS authority table. Samples can be recorded as belonging to one of a domain, subprovince or province. The province hierarchy is included in the GEOPROVS table so that all samples belonging to a particular province can be retrieved regardless of whether they have been saved as a province, a subprovince, or a domain. For Oracle users the following statement will retrieve a list of all subprovinces and their domains that belong to the Mount Isa Inlier. These can then be used to retrieve the required records from the database -

select provno from geoprovs
connect by prior provno = parent start with provno = 54

MAPSYMBOL: A 8-character optional field for recording recognised map symbols for lithological units. Only symbols already in the LITHUNITS authority table can be entered. This field is primarily for identifying units in Archaean terranes where little or no formal stratigraphy has been defined (the Yilgarn is the only province with symbols in this table so far). Map symbols are unique for each province. The development of province-wide stratigraphy with matching geological units having the same symbol between sheets facilitates the easy integration of the data within a GIS.

MODEOCC: A 4-character field for recording the mode of occurrence of the sample (xenolith, dyke, sill, pipe). Valid occurrence modes are described in the LITHDATATYPES authority table having the Data Type 'IOM' for igneous occurrence mode or 'SOM' for sedimentary occurrence mode.

SECTHOLENO: An optional integer of up to 5 digits. The sectholeno is used to link records in the ROCKS table with drill hole or measured section records in the SECTHOLES table. The sectholeno can only be entered if there is a matching record in SECTHOLES.

ENTRYDATE: As for the SITES and OUTCROPS tables.

ENTEREDBY: As for the SITES and OUTCROPS tables.

2.4 – THE LITHDATA TABLE

The LITHDATA table, which has a many-to-one relationship with the ROCKS table, provides an extendable attribute system for the ROCKS table. All entries in LITHDATA are controlled by the ROCKDATATYPES database view which is a view covering the LITHDATATYPES table and the AGSOMINERALS table.

Description of columns

ROCKNO: A 5-digit integer which links attribute records in the LITHDATA table to records in the ROCKS table.

DATATYPE: A mandatory field of up to 4 capital letters for an abbreviation pointing to a Data Type (attribute name) in the ROCKDATATYPES view. Only data types already in the ROCKDATATYPES view may be entered, but the same Data

Type may be inserted more than once (e.g., a sample may exhibit two types of alteration - sericitic and potassic in a porphyry system).

SUBTYPE: A mandatory field of up to 4 capital letters for an abbreviation pointing to a subtype (value of an attribute) of a Data Type in the ROCKDATATYPES view. Below is a listing of subtype values for the Alteration Data Type.

DATATYPE		SUBTYPE	
ALT	Alteration	PR	propylitic
ALT	Alteration	PO	potassic
ALT	Alteration	KA	kaolinitic
ALT	Alteration	AR	argillic
ALT	Alteration	SE	sericitic
ALT	Alteration	SI	silicified
ALT	Alteration	ZE	zeolitic
ALT	Alteration	GR	greisen
ALT	Alteration	PY	pyritic
ALT	Alteration	SK	skarn
ALT	Alteration	EP	epidotised
ALT	Alteration	CL	chloritic
ALT	Alteration	CA	carbonate
ALT	Alteration	SP	serpentinised
ALT	Alteration	AB	albitic
ALT	Alteration	HM	hematitic
ALT	Alteration	AL	alunitic

DESCRIPTION: An optional field of 64 characters for any additional descriptive information relating to the Data Type/Subtype record.

ENTRYDATE: As for the SITES, OUTCROPS and ROCKS tables - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTEREDBY: As for the SITES, OUTCROPS and ROCKS tables.

2.5 THE SECTHOLES TABLE

The SECTHOLES table has a many-to-one relationship with the SITES table and is for 'header' information for each drill hole or measured stratigraphic section. It records the ID, section type, initial azimuth, initial inclination, total section length, the relationship of the section or drill hole to bedding and if the section is up or down sequence.

The Primary Key for the SECTHOLES table is sectholeno.

Description of columns

SECTHOLENO: A unique sequential integer of up to 5 digits which links secthole records with matching records in the INTERIZONS table.

ORIGNO: As for the SITES, OUTCROPS and ROCKS tables.

SITEID: As for the SITES, OUTCROPS and ROCKS tables.

SECTYPE: A single-character field which indicates the type of measured section being described (ie, surface measured section or type of drillhole). Valid choices come from the SECTYPES authority table

TYPESEC: A mandatory single-character field which indicates if the section is a type section (**T**), reference section (**R**) or other (**O**).

PEDIN_UNO: An optional 8-character field. This provides a link to well descriptions in the Pedin database (National Petroleum Exploration Data Index).

DH_COMPANY: An optional free-text field of up to 48 characters for the name of the company or organisation which drilled the hole.

DH_ID: An optional free-text field of up to 48 characters for the name of the drill hole.

AV_AZIMUTH: An optional three-digit field for the average azimuth of a non-vertical, essentially straight measured section or drill hole in degrees east of true north.

AV_INCLIN: An optional up to two-digit field for the average inclination of a essentially straight measured section or the drill hole in degrees. Positive if above the horizontal, negative if below.

TOT_METRES: An optional six-digit field for the total down hole depth of the drill hole in metres. Up to two digits are allowed after the decimal place, allowing depths to the nearest centimetre.

BEDPERP: A mandatory single-character field for either a 'Y' or an 'N', for yes or no, indicating if the drill hole or measured section is perpendicular to bedding. If the drill hole or measured section is perpendicular to bedding then intervals given in INTERIZONS table can be regarded as true thicknesses.

REFID: A 9-character field that identifies a reference in AGSOREFS, AGSO's Bibliographic References Database, which refers to the drill hole or measured section.

UPORDOWN: A mandatory single-character field for either 'U', 'D' or '?', to indicate if the drill hole or measured section is up or down sequence or not known.

ENTRYDATE: As for the SITES, OUTCROPS AND ROCKS tables - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTEREDBY: As for the SITES, OUTCROPS AND ROCKS tables.

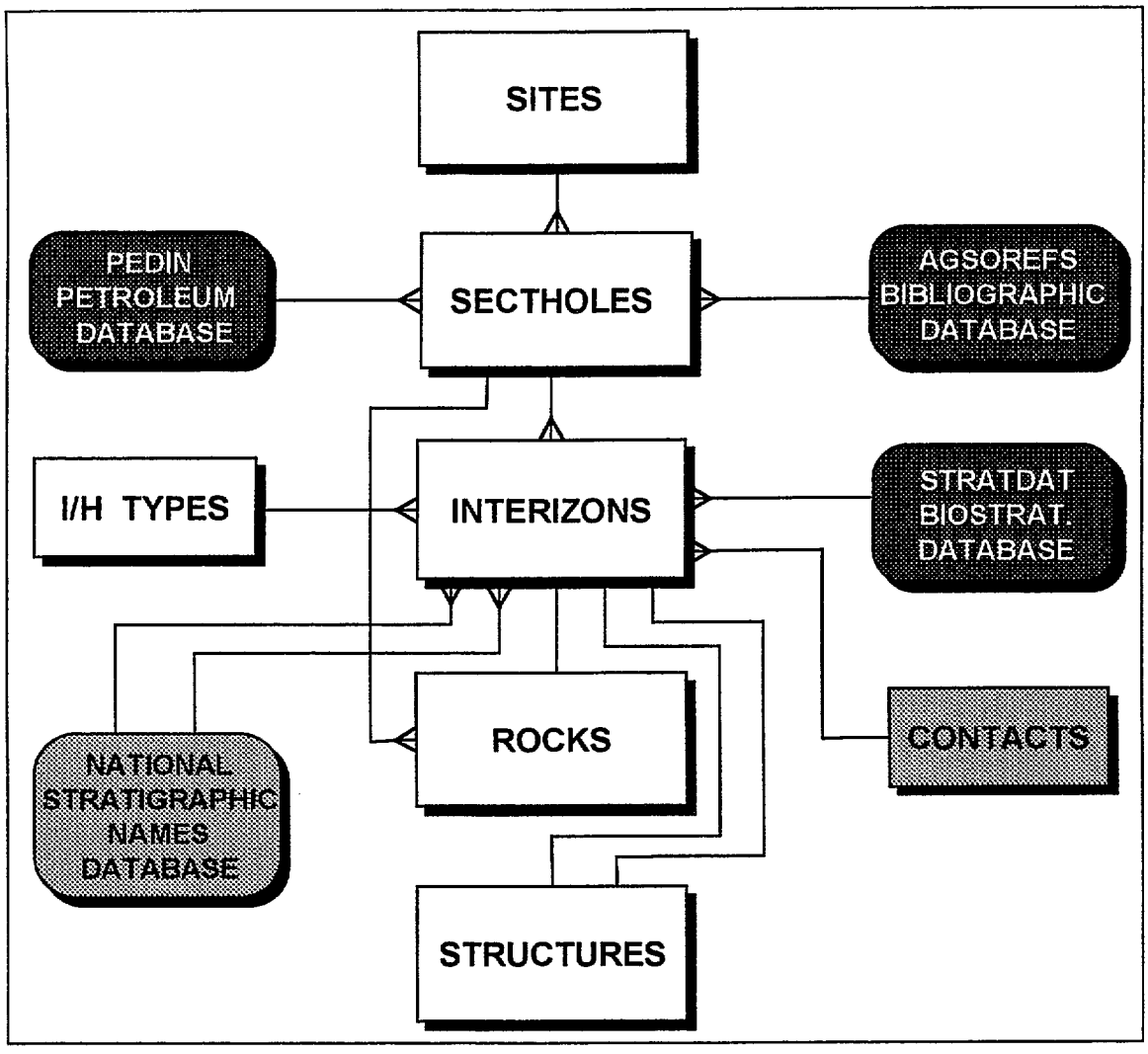

Figure 2.1 A schematic diagram of the table and data relationships for recording measured sections and drill holes. "Crows" feet indicate the many end of many-to-one links.

2.6 THE INTERIZONS TABLE

The INTERIZONS table has a many-to-one relationship with the SECTHOLES table. For any one drill hole or measured section many intervals may be described, and for any one interval several types of information may be recorded. The INTERIZONS table records only the lengths of described intervals and the type of data being described. Pointers in the table point to full descriptions which are stored in the ROCKS and STRUCTURES tables, and the STRATLEX view. The CONTACTS and some STRATDAT authority tables are also pointed to by the INTERIZONS table. The relationships of associated tables is shown in figure 2.1.

The Primary Key for INTERIZONS is the interizons number, iz_no.

Description of columns

IZ_NO: A unique sequential integer of up to 6 digits.

SECTHOLENO: An integer of up to five digits which links records in the INTERIZONS table with their parent record in the SECTHOLES table.

RECTYPE: A mandatory field of up to three characters which indicates the type of information recorded (record type) for each interval. For any interval several types of information could be described, e.g. lithology, structure or stratigraphy, so that for any one interval there may be one or more records. The data for each record type are stored in the table that relates to that data type, and the record type is the pointer to the table which stores that particular record. Lithological data - record type LTH - are stored in the ROCKS table, and structural data - record type STR - are stored in the STRUCTURES table. Vector information for a measured section traverse or a drill hole - record type SVY - are stored in the STRUCTURES table. Rock unit boundary indicates either the overlying or underlying stratigraphic unit, details of which are stored in the STRATLEX authority view. Stratdat geochronographic datum information is stored in the Stratdat authority tables STD_DATM_AGE, STD_DATM_NAME and STD_TYPE.

D1: A mandatory number field of up to six digits for the commencing distance or depth of the described interval in metres. Up to two digits are allowed after the decimal place.

D2: An optional number field of up to six digits for the terminating distance or depth of the described interval in metres. Up to two digits are allowed after the decimal place.

PERCENT: An optional number field of up to 7 digits. Up to two digits are allowed after the decimal place. This field is used to record the percentage occurrence of a particular lithology within an interval. It is mandatory if the rectype is 'LTH'.

DETAIL_PTR: An optional number field of up to seven digits which holds a value which is a pointer to a record in another table. Only one record per record type is stored in this field and can be a value for any of the following record types - contact type, overlying stratigraphic unit number, rockno, or structno. The code for the geological contact type points to the full name in the CONTACTS authority table, the name and defining details of the overlying stratigraphic unit is in the STRATLEX authority view, the lithological description is in the ROCKS table, and structural and survey information is in the STRUCTURES table. Table 2.1 shows the record types and the corresponding data types and the tables which hold the information.

DETAIL_PTR_CHR: An optional field of up to 7 characters which holds a value which is a pointer to a record in another table. Only one record per record type is stored in this field. The record could be a value for either of the following record types - overlying stratigraphic unit or Stratdat datum code. As for the overlying stratigraphic unit in the field detail_ptr, the name and defining details of the underlying stratigraphic unit are in the STRATLEX authority view. The Stratdat datum code indicates a stratdat datum name defined in the Stratdat tables STD_DATM_NAME and STD_DATM_AGE.

DETAIL_PTR_CHR2: An optional field of up to 7 characters which holds several values separated by a colon which are pointers to records in the Stratdat table STD_TYPE. The STD_TYPE table is for the type of geostratigraphic datum.

COMMENTS: A 128-character optional free-text field for any additional comments regarding the interval.

ENTRYDATE: As for the SITES, OUTCROPS, ROCKS and SECTHOLES tables - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

RECTYPE	RUB	LTH	STR	SVY	CON	STD
POINTS TO TABLE	Stratlex	Rocks	Structures	Structures	Contacts	Stratdat Database
DETAIL_PTR	stratno (overunit)	rockno	structno	structno	contactid	
DETAIL_PTR_CHR	stratno (underunit)					datum name
DETAIL_PTR_CHR2						datum type

Table 2.1 : The relationship of the detail pointer fields (DETAIL_PTR, DETAIL_PTR_CHR and DETAIL_PTR_CHR2) in the INTERIZONS table with the tables that hold the data for each interval description. The table that each Record Type (RECTYPE) refers to is shown in the second row. For each of the Record Types the values in the Detail Pointer fields will correspond to the primary key fields for the table shown in the second row.

2.7 THE STRUCTURES TABLE

The STRUCTURES table contains structural measurements for lithological descriptions in the ROCKS table or the INTERIZONS table.

The Primary Key for STRUCTURES is strucno.

Description of columns

ORIGNO: As for the SITES, OUTCROPS and ROCKS tables.

SITEID: As for the SITES, OUTCROPS and ROCKS tables.

STRUCNO: A 6-digit integer. This field links structural measurements with parent records in the INTERIZONS table.

ROCKNO: A 6-digit integer. This is a foreign key which links structural measurements to parent lithology descriptions in the ROCKS table.

TYPE: A mandatory 2-digit integer pointing to a structural type in the STRUCTYPES authority table.

SUBTYPE: An optional 2-digit integer pointing to a structure subtype in the STRUCTYPES authority table.

AZIMUTH: A 3-digit integer for the azimuth of the structural observation in degrees between 0° and 360°. For planar observations the azimuth always the direction of dip. The azimuth of horizontal planar structures is always zero.

INCLINATION: A 2-digit integer - between 0° and 90° - for the vertical inclination of the structural vector below the horizontal.

DEFNO: A single-digit integer for the number of the deformation that produced the structure being measured.

DEFSURFNO: A single-digit integer for the deformation that produced the deformed surface being measured.

PLOTRANK: A 3-digit integer indicating the order of importance in plotting the structure on a map. Where a number of structures have been measured at the one locality, plot rank determines which structures will be plotted first.

ENTRYDATE: As for the SITES, OUTCROPS and ROCKS tables - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTEREDBY: As for the SITES, OUTCROPS and ROCKS tables.

2.8 THE RB-SR TABLES

The Rb-Sr tables embody the standard isochron method of Rb-Sr dating. Analysed samples may be from crushed whole rocks or mineral separates. Analytical results yield a pair of isotope ratios which can be plotted on the co-ordinates $^{87}Sr/^{86}Sr$ versus $^{87}Rb/^{86}Sr$. A suite of geologically related whole rock samples should form a straight line, with the slope indicating the time since the rock system cooled beneath the strontium migration temperature and the $^{87}Sr/^{86}Sr$ axis intercept giving the isotopic composition of the Sr (initial $^{87}Sr/^{86}Sr$ ratio) at that time. Data from a combination of a whole rock and its constituent minerals may provide data about the timing of a subsequent metamorphic event.

The Rb-Sr data are stored in two tables. The RB_SR table records analytical data on individual samples or separates. The RBSR_AGES table is for the 'pooled' age information derived from combined analytical results. The common keys for linking the two tables are the Record Number (recno) in RBSR_AGES and Age Pointer (age_pointer) in RB_SR.

2.9 RB_SR TABLE

The Primary Key for RB_SR is analno.

Description of columns

AGE_POINTER: Points to the record number (recno) of a 'pooled result' in the RBSR_AGES table.

ANALNO: System generated unique number. Determines the ordering of records in the table.

ORDERNO: Optional number for establishing the ordering of analytical results associated with a particular record number in the RBSR_AGES table.

ORIGNO: When combined with the sample number, forms a unique key to point to stratigraphic information in the ROCKS table.

SITEID: When combined with the originator number, forms a unique key to point to the location information in the SITES and OUTCROPS tables. Having the site ID in this table obviates the need to join first with the ROCKS table to acquire the site ID before location information can be obtained from SITES.

SAMPLEID: When combined with the originator number forms a unique key to point to stratigraphic information in the ROCKS table.

REFID: Mandatory pointer to an existing reference in the AGSOREFS table.

METHODNO: Optional pointer to a description of the analytical method in the METHODS table.

MINERAL: Optional field of up to 16 characters for indicating the material analysed - 'whole rock' or the name of the separated mineral.

RB_PPM: Mass abundance of rubidium in parts per million.

SR_PPM: Mass abundance of strontium in parts per million.

RB87SR86: Calculated isotope ratio $^{87}Rb/^{86}Sr$.

SR87SR86: Observed isotope ratio $^{87}Sr/^{86}Sr$.

COMMENTS: Optional 240-character field for any additional information.

RELEASED: The date the data were released for sale - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTRYDATE: As for the SITES, OUTCROPS and ROCKS tables - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTEREDBY: As for the SITES, OUTCROPS and ROCKS tables.

LASTUPDATE: The date of the last update - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

RESTRICTED: A single-character field which may contain either 'U' or 'R' for unrestricted or restricted, respectively.

2.10 RBSR_AGES TABLE

The Primary Key for the RBSR_AGES table is recno.

Description of columns

RECNO: System supplied number. Links this table with analytical results in the RB_SR table.

AGE: The Rb-Sr isochron or model age expressed in Ma.

STD_DEVA: Error in age at the 95% confidence level in Ma

INIT_RATIO: The isochron's intercept on the $^{87}Sr/^{86}Sr$ axis.

STD_DEVI: Error in intial $^{87}Sr/^{86}Sr$ at the 95% confidence level.

COMMENTS: Optional field of up to 240 characters for additional information and commentary on the geological significance of the results.

MSWD: Mean square of weighted deviates.

RELEASED: The date the data were released for sale - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTRYDATE: As for the SITES, OUTCROPS and ROCKS tables - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTEREDBY: As for the SITES, OUTCROPS and ROCKS tables.

LASTUPDATE: The date of the last update - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

RESTRICTED: A single-character field which may contain either 'U' or 'R' for unrestricted or restricted, respectively.

2.11 CONVENTIONAL U-PB DATA TABLES

There are two isotopic methods currently used which are based on the radioactive decay of uranium to lead: conventional and ion microprobe (or SHRIMP) analysis. The conventional method involves chemical pre-treatment of a uranium-bearing minerals - commonly zircon - in amounts ranging from milligrams to a few grains, and reduction of the data using the 'Concordia' diagram, consisting of a Y-axis = $^{206}Pb^*/^{238}U$ and an X axis = $^{207}Pb^*{}^{235}U$. The asterisk in these relationships denotes the radiogenic component generated over the lifetime of the host mineral, a quantity obtained by subtracting the common Pb in proportion to the observed ^{204}Pb abundance. Conventionally, this contaminant is isotopically likened to the average Pb in the country rock, or the ratios prescribed by the Pb growth curve most favoured by the author for Pb of the appropriate age.

A further complication is possible contamination in the laboratory during processing. Since there is an inevitable uncertainty about the isotopic character of the common Pb, the corrected Concordia variables, and the consequent age estimates, are most reliable when the observed $^{206}Pb/^{204}Pb$ is large (~10,000).

The power of the Concordia treatment lies in the assumption that the present-day value of the ratio $^{238}U/^{235}U$ is a natural constant. This is true for most localities and for all of the analysed samples in the database. However, one case is known of a "natural reactor" at Oklo, Gabon, West Africa. Here a mid-Proterozoic uranium accumulation in an old river bed "went critical", and a significant proportion of its ^{235}U was consumed.

Assumed constancy in the U ratio leads to a single, time-dependent exponential curve ("Concordia") which is the locus of all samples which have neither lost nor gained U or Pb in the time since zircon crystal formation. Loss of Pb (or gain of U) yields a point below Concordia. The converse, plotting above the curve, is less common. A suite of zircon fractions from the one sample, in which there is a range of Pb loss, defines a single line ("Discordia"), for which the upper intercept with Concordia corresponds with zero Pb loss and the age of crystal formation. Displacement along Discordia is related to the degree of loss.

There are several algorithms which describe such a line. The simplest permits a second, lower, intercept which may be related to the time of a second event associated with an "instantaneous" loss of the missing Pb. A chord joining sample point with the origin intercepts Concordia at the minimum possible age estimate for the host sample. There is yet another possible complication, arising from the inheritance of Pb from an earlier incarnation. This is discussed below under the SHRIMP data.

Conventional U-Pb data are stored in two tables. In the U-PB table, data from the individual minerals are stored, whilst in the UPB_AGES table, the results from the individual minerals are pooled. The U_PB table has a many-to-one relationship to the

UPB_AGES table, as there are commonly a number of analyses that go to make up one pooled result stored in the UPB_AGES table.

2.12 U_PB TABLE

The Primary Key for RB_SR is analno.

Description of columns

RECNO: System supplied number, which is automatically generated. Points to the record number of a pooled result in the UPB_AGES table.

ANALNO: System-generated unique number.

ORIGNO: As for the RB_SR table.

SITEID: As for the RB_SR table.

SAMPLEID: As for the RB_SR table.

ORDERNO: Optional number for establishing the ordering of analytical results associated with a particular record number in the UPB_AGES table.

FRACTION: Optional 16-character field for the analysed fraction of a sample.

REFID: Mandatory pointer to an existing reference in the AGSOREFS table.

METHODNO: Optional pointer to a description of the analytical method in the METHODS table.

WEIGHT: Sample weight in milligrams.

U_PPM: Mass abundance of uranium in parts per million.

PB_PPM: Mass abundance of lead in parts per million.

PBRAD_PPM: Optional. Calculated mass abundance of radiogenic lead in parts per million - after correction for common lead.

PB206PB204: Optional. Measured $^{206}Pb/^{204}Pb$ ratio. An indicator of the amount of common lead contamination.

PB206RAD: Optional. Mass abundance of radiogenic ^{206}Pb in parts per million.

PB207RAD: Optional. Mass abundance of radiogenic ^{207}Pb in parts per million.

PB208RAD: Optional. Mass abundance of radiogenic ^{208}Pb in parts per million.

PB207PB206: Optional. Atomic ratio of radiogenic ^{207}Pb and ^{206}Pb.

PB206U238: Optional. Atomic ratio of radiogenic ^{206}Pb and ^{238}U - ordinate of Concordia diagram.

PB207U235: Optional. Atomic ratio of radiogenic ^{207}Pb and ^{235}U - abscissa of Concordia diagram.

MIN76_AGE: Optional. Minimum Pb-Pb age in Ma derived from the slope of the chord from origin to sample point. This age is also given by the intercept of this chord on Concordia.

STD_DEV1: Optional. The 67% error limits in the minimum age estimated in Ma.

APP206_238: Age in Ma derived from the ratio $^{206}Pb^*/^{238}U$.

STD_DEV2: Optional. The 67% error limits in the $^{206}Pb^*/^{238}U$ age in Ma.

APP207_235: Age in Ma derived from the ratio $^{207}Pb^*/^{235}U$.

STD_DEV3: Optional. The 67% error limits in the $^{207}Pb^*/^{235}U$ age in Ma.

APP208_232: Optional. Age in Ma calculated from the ratio $^{208}Pb^*/^{232}Th$.

STD_DEV4: Optional. The 67% error limits in the $^{208}Pb^*/^{232}Th$ age in Ma.

COMMENTS: Optional field of up to 240 characters for additional information.

RELEASED: The date the data were released for sale - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTRYDATE: As for the SITES, OUTCROPS and ROCKS tables - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTEREDBY: As for the SITES, OUTCROPS and ROCKS tables.

LASTUPDATE: The date of the last update - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

RESTRICTED: A single-character field which may contain either 'U' or 'R' for unrestricted or restricted, respectively.

2.12 UPB_AGES TABLE

The Primary Key for the UPB_AGES table is recno.

Description of columns

RECNO:. Links this table with analytical results in the U_PB table.

AGE: Pooled age expressed in Ma. Commonly deduced from the upper intercept of the Discordia line with Concordia.

STA_DEVA: Optional 95% confidence level error in Ma.

LI_AGE: Age in Ma indicating the time of Pb-loss allowed for in the simplest model, i.e., the lower intercept of the Discordia line with Concordia.

STD_DEVI: Optional 95% confidence level error in Ma.

MSWD: Mean square of weights deviates

COMMENTS: Optional field of up to 240 characters for additional information or a commentary on the geological significance of the age result.

RELEASED: The date the data were released for sale - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTRYDATE: As for the SITES, OUTCROPS and ROCKS tables - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTEREDBY: As for the SITES, OUTCROPS and ROCKS tables.

LASTUPDATE: The date of the last update - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

RESTRICTED: A single-character field which may contain either 'U' or 'R' for unrestricted or restricted, respectively.

2.13 THE U-PB 'SHRIMP' DATA TABLES

These tables are used for U-Pb data obtained from the Sensitive High-resolution Ion MicroProbe (SHRIMP). The calculations are similar to those described above under the conventional U-Pb Minerals Form. The difference is that polished sections of individual zircon grains are analysed. A primary beam of oxygen ions is focussed to a spot about 30 microns in diameter, and multiple analyses of a single zircon grain are possible. Distinctions can be drawn between older cores of mineral grains and later material forming the rims.

The SHRIMP table has a many-to-one relationship to the SHRIMP_AGES table, a rock sample is usually associated with multiple spot analyses.

2.14 SHRIMP TABLE

The Primary Key for SHRIMP is analno.

Description of columns

RECNO: System-supplied number, which is automatically generated. Links this table with analytical results in the U_PB table.

ANALNO: System-generated unique number.

LABNO: Optional 16-character field for laboratory identification, as distinct from field sample numbering.

GRAINO: Optional 16-character field for identifying a particular mineral grain on the sample mounting.

SPOTNO: Optional 16-character field for identifying a spot analysis amongst several on a single mineral grain.

ORDERNO: Optional number for establishing the ordering of analytical results associated with a particular SHRIMP_AGES record number.

REFID: Mandatory pointer to an existing reference in the AGSOREFS Table.

U_PPM: Mass abundance of uranium in parts per million.

TH_PPM: Mass abundance of thorium in parts per million.

TH_OVER_U: Calculated atomic ratio of thorium to uranium.

PB204_PPB: Calculated mass abundance of ^{204}Pb.

PB206PB204: Measured $^{206}Pb/^{204}Pb$ ratio.

F_PCT: Percentage of common ^{206}Pb in measured ^{206}Pb.

PB207PB206: Atomic ratio of radiogenic ^{207}Pb to ^{206}Pb after correction for common lead.

STD_DEV1: Optional. The 67% error limits in the $^{207}Pb^*/^{206}Pb^*$ ratio.

PB208PB206: Atomic ratio of radiogenic ^{208}Pb to ^{206}Pb after correction for common lead.

STD_DEV2: Optional. The 67% error limits in the $^{208}Pb^*/^{206}Pb^*$ ratio.

PB206U238RAD: Atomic ration of radiogenic $^{206}Pb^*$ to parent ^{238}U - ordinate of Concordia diagram.

STD_DEV3: Optional. The 67% error limits in the $^{206}Pb^*/^{238}U$ ratio.

PB207U235RAD: Atomic ratio of radiogenic $^{207}Pb^*$ to parent ^{235}U - abscissa of Concordia diagram.

STD_DEV4: Optional. The 67% error limits in the $^{207}Pb^*/^{235}U$ ratio.

PB208TH232RAD: Atomic ratio of radiogenic $^{208}Pb^*$ to parent ^{232}Th.

STD_DEV5: Optional. The 67% error limits in the $^{208}Pb^*/^{232}Th$ ratio.

MIN76_AGE: The $^{207}Pb^*/^{206}Pb^*$ age in Ma derived from the slope of the chord from origin to sample point. This age is also given by the intercept of this chord on Concordia.

STD_DEV6: Optional. The 67% error limits in the minimum age estimate in Ma.

AGE206_238: Age in Ma derived from the ratio $^{206}Pb^*/^{238}U$.

STD_DEV7: Optional. The 67% error limits of the $^{206}Pb^*/^{238}U$ in Ma.

AGE207_235: Age in Ma derived from the ratio $^{207}Pb^*/^{235}U$.

AGE208_232: Optional. Age in Ma calculated from the ratio $^{208}Pb^*/^{232}Th$.

COMMENTS: Optional field of up to 240 characters for additional information.

RELEASED: The date the data were released for sale - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTRYDATE: As for the SITES, OUTCROPS and ROCKS tables - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTEREDBY: As for the SITES, OUTCROPS and ROCKS tables.

LASTUPDATE: The date of the last update - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

RESTRICTED: A single-character field which may contain either 'U' or 'R' for unrestricted or restricted, respectively.

2.15 SHRIMP_AGES TABLE

The Primary Key for the SHRIMP_AGES table is recno.

Description of columns

RECNO: System-supplied number, which is automatically generated. Links this table with analytical results in the SHRIMP table.

ORIGNO: As for the RB_SR and U_PB table.

SITEID: As for the RB_SR and U_PB table.

SAMPLEID: As for the RB_SR and U_PB table.

AGE: Pooled age expressed in Ma. Commonly deduced from the upper intercept of the Discordia line with Concordia.

STA_DEVA: 95% confidence level error of the pooled age in Ma.

LI_AGE: Age in Ma indicating the time of Pb-loss allowed for in the simplest model, i.e., the lower intercept of the Discordia line with Concordia.

STD_DEVI: 95% confidence level error of the lower intercept age in Ma.

COMMENTS: Optional field of up to 240 characters for additional information, or a commentary on the geological significance of the age result.

RELEASED: The date the data were released for sale - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTRYDATE: As for the SITES, OUTCROPS and ROCKS tables - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTEREDBY: As for the SITES, OUTCROPS and ROCKS tables.

LASTUPDATE: The date of the last update - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

RESTRICTED: A single-character field which may contain either 'U' or 'R' for unrestricted or restricted, respectively.

METHOD: A single-integer field which points to values in the MEAN_METHOD authority table. This field records the method used to calculate the mean values for each analysis recorded in the SHRIMP table. For each analysis of a zircon grain the ratios of the isotopes are derived by calculating the mean of seven individual mass spectrometer measurements. The mean is calculated from either a linear data fit, a curved data fit or a combination of both.

COMMON_PB: A single integer field which points to values in the COMMON_PB authority table. This field records common lead isotope used for correcting for common lead.

AGE_USED: A single-integer field which points to values in the AGE_USED authority table. This field records which isotope ratio was used to give the pooled age.

2.16 THE SM-ND DATA TABLES

This OZCHRON release contains Sm-Nd isotope data for samples from the Australian continent. They are related to AGSO (formally BMR) research programs.

All data reported in this document were collected in the Research School of Earth Sciences, Australian National University (RSES, ANU) following standard analytical procedures (eg., McCulloch & Chappell, 1982; Nd isotopic characteristics of S- and I-type granites. Earth and Planetary Sciences Letters 58; Maas & McCulloch, 1991 The provenance of Archaean clastic sediments in the Narryer Gneiss Complex, Western Australia: trace element geochemistry, Nd isotopes and U-Pb ages from detrital zircons. Geochimica et Cosmchimica Acta, 27). Many samples were analysed through collaboration between AGSO staff and members of the RSES, ANU. Whole rock

chemistry and isotopic age determination for many of these samples can be found in the AGSO ROCKCHEM and OZCHRON data bases.

Compared to the Rb-Sr system, the Sm-Nd system has the advantage of being more robust to alteration and weathering. However, since Sm and Nd have very similar geochemical behaviour, they commonly show limited fractionation through magmatic generation and differentiation. Thus, under normal circumstances this method is not ideal for whole-rock isochron dating. A common practice of pooling data for samples with a range of Sm/Nd but not genetically related (e.g. basalts, komatiites and granites of a greenstone belt) often results in an unreliable isochron. In contrast, Sm-Nd mineral-whole rock isochrons are generally reliable, unless isotopic dis-equilibrium occurred during metamorphism.

The geological meaning of Nd isotope model ages is interpretative. Ion-probe zircon U-Pb dating of the same sample can greatly help to improve the interpretation.

Neodymium isotope data combined with geological and chemical information can be useful for ore genesis studies and as an exploration guide. For example, Ordovician shoshonites and calc-alkaline rocks in central western New South Wales have very distinctly high initial εNd (commonly +7), whereas granites in the region have initial εNd values ranging from 0 to -10. Thus, Nd isotope analysis of tourmaline-bearing hydrothermal veins from this region is potentially useful for fingerprinting of Cu/Au mineralisation associated with the Ordovician shoshonites and calc-alkaline rocks.

A method analogous to the Rb-Sr isochron technique can be applied to the Nd-Sm system using a plot of $^{143}Nd/^{144}Nd$ versus $^{147}Sm/^{144}Nd$. Indeed, mineral ages can occasionally be obtained from a combination of whole rock samples and mineral separates. For this reason the arrangement of the Sm-Nd tables has been kept the same as the Rb-Sr tables. However, a linear regression through a suite of related whole rock samples is usually not practical because of insufficient spread in the Sm/Nd ratio. Furthermore, whole rock isochron ages obtained by pooling data for a group of unrelated samples commonly are erroneous because of variation in initial $^{143}Nd/^{144}Nd$ values. In most cases each analysis must be treated separately, with model age calculated from assumptions about the protolith. Similar assumptions were required in the early days of dating by other radioactive decay systems. The assumed quantity is the 'initial ratio' - the isotopic composition of the daughter nuclide at the time diffusive losses ceased.

In the Sm-Nd system, the principle of model age calculations remains the same. The model age (T Nd) derives from the slope of the chord on the isochron diagram which connects sample point and reference point. In early publications the latter was chosen assuming that the original mantle (assumed protolith) was chemically similar to cosmic material represented by chronditic meteorites (CHUR = **CH**ronditic **U**niform **R**eservoir). This is no longer considered adequete as the mantle is now known to be inhomogeneous and "depleted" as a result of crust formation. Since different depleted parameters are used by different authors for model age calculation, one needs to be cautious or consult an expert when the data are assessed. However, the time-adjusted initial epsilon Nd value (εNd) is still presented as a (parts per 10,000) difference from the CHUR value for $^{143}Nd/^{144}Nd$.

To calculate the depleted mantle model age (T_{DM}) for a sample we follow a common practice which assumes the mantle formed at 4.56 Ga (age of the earth) and there is a linear increase of initial εNd to +10 in the present day mantle ($^{143}Nd/^{144}Nd = 0.51316$ relative to a CHUR value of 0.51265). For Proterozoic rocks with $^{147}Sm/^{144}Nd = 0.11$ (common for felsic rocks) T_{DM} calculated this way is generally 200 Ma older than model ages calculated (McCulloch, 1987 Sm-Nd isotopic constraints on the evolution of Precambrian crust in the Australian continent in Proterozoic lithospheric evolution. In: Proterozoic Lithospheric Evolution. American Geophysical Union 17), which assumes mantle depletion began at 2.7 Ga.

$$T_{DM}(\text{in Ma}) = \frac{1}{\lambda} \ln\left\{ \frac{[(^{143}Nd/^{144}Nd)sample - (^{143}Nd/^{144}Nd)_{DM}]}{[(^{147}Sm/^{144}Nd)sample - (^{147}Sm/^{144}Nd)_{DM}]} + 1 \right\}$$

where $\lambda = 6.54 * 10^{-12}\ yr^{-1}$; the decay constant of ^{147}Sm to ^{143}Nd
$(^{143}Nd/^{144}Nd)_{DM} = 0.51316$ and $(^{147}Sm/^{144}Nd)_{DM} = 0.2136$

In this database two-stage model ages (T_2) are reported for felsic rocks which have $^{147}Sm/^{144}Nd$ outside the commonly observed range of 0.09 to 0.13. The most recent stage of Nd isotope evolution is calculated with the measured $^{147}Sm/^{144}Nd$ to the geological age (T_1) of the sample.

A commonly observed $^{147}Sm/^{144}Nd = 0.11$ is assigned to earlier evolution (from the gological age to T_{DM}). This approach is quite successful for granites with high $^{147}Sm/^{144}Nd$ as a result of extensive crystal fractionation involving LRE enriched minerals.

The equation used for T_2 is as follows

$$T_2(Ma) = 10^3 * \left\{ \frac{-0.456\ \varepsilon Nd T_1 + 5.051 T_{1/1000} + 4.56}{6.051} \right\}$$

The calculated Nd model age represents the average crustal residence time of source material. The initial εNd (εNd_i) value at the geological age of the sample (Tg) can be the result of mixing material derived from different sources such as depleted mantle and older crust components (Figure 2.2)

There has been a change, in the normalisation of mass-spectrometer bias. Pre-1987 data in this document were collected on a single collector mass spectrometer (MSZ) at the Research School of Earth Sciences, ANU. To correct for mass fractionation during analysis Nd isotopic ratios were normalised to $^{146}Nd/^{142}Nd = 0.636151$ (e.g. McCulloch and Chappell, 1982). The conversion now adopted is use a normalisation value of $^{146}Nd/^{144}Nd = 0.7219$. A conversion factor of 1.001596, based on comparison of values for standards, has been applied to all $^{143}Nd/^{144}Nd$ data collected on the MSZ.

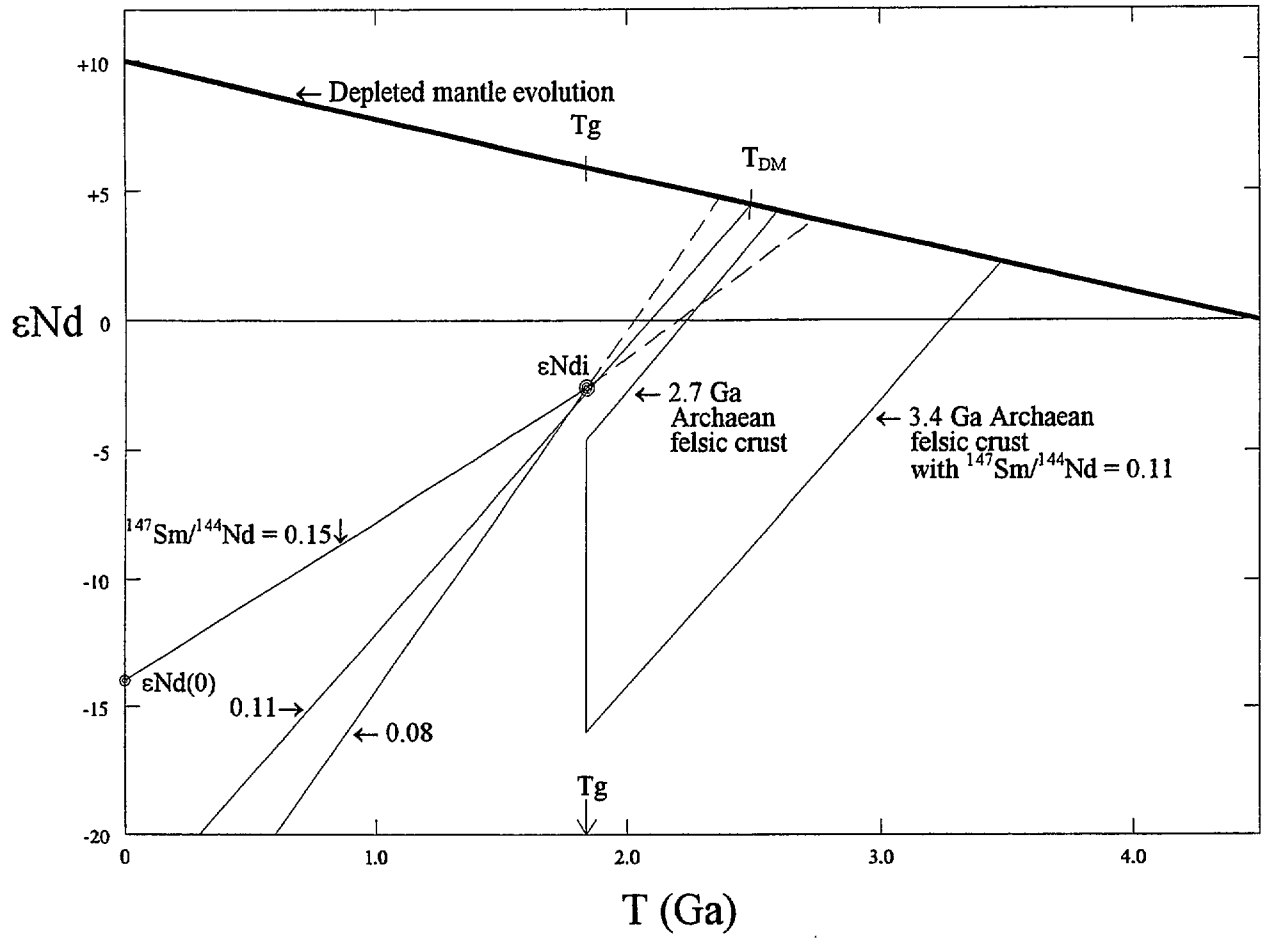

Figure 2.2 Initial εNd versus geological age plot illustrating the way model age T_{DM} is calculated for the two-stage model. For the most recent stage the εNd evolution is calculated with measured $^{147}Sm/^{144}Nd$ to the geological age (Tg) of the sample. For the earlier evolution a value of 0.11 is assigned for $^{147}Sm/^{144}Nd$. In addition to the simple two-stage interpretation the calculated initial εNd (εNdi) at the geological age of the sample (Tg) can be a result of mixing of material derived from different sources such as the depleted mantle and older crustal components of various ages.

2.17 SMND_AGES TABLE

The Primary Key for the SMND_AGES table is recno.

Description of columns

RECNO: System supplied 6-digit integer.

MSWD: Optional. Mean square of weighted deviates.

AGE: Optional. The pooled isochron age (if applicable) expressed in Ma.

STA_DEVA: Optional. Age error envelope at the 95% confidence level.

INIT_RATIO: Optional: Extrapolated intercept on the isochron on the $^{143}Nd/^{144}Nd$ axis, or a calculated value based on the measured or estimated geological age.

STD_DEVI: Optional. The Initial Ratio error envelope at the 95% confidence level.

EPSILON: Initial εNd value at the assigned geological age -

$$\varepsilon Nd = \left[\frac{(^{143}Nd/^{144}Nd)_{\text{sample at time of formation}}}{(^{143}Nd/^{144}Nd)_{\text{CHUR at same time}}} - 1 \right] * 10^4$$

STD_DEV2: Optional. The epsilon error envelope at the 95% confidence level

COMMENTS: Optional 240-character field for additional information.

RELEASED: The date the data were released for sale - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTRYDATE: As for the SITES, OUTCROPS and ROCKS tables - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTEREDBY: As for the SITES, OUTCROPS and ROCKS tables.

LASTUPDATE: The date of the last update - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

RESTRICTED: A single-character field which may contain either 'U' or 'R' for unrestricted or restricted, respectively.

2.18 SM_ND TABLE

The Primary Key for the SM_ND table is analno.

Description of columns

AGE_POINTER: System-generated. Points to the record number of a 'pooled result' in the SMND_AGES table.

ANALNO: System-generated unique number. Determines the ordering of records in the table.

ORDERNO: Optional number for establishing the ordering of analytical results associated with a particular record number in the SMND_AGES table.

ORIGNO: When combined with the sample number, forms a unique key to point to stratigraphic information in the ROCKS table. When combined with Sample Number in ROCKS, the site ID can be identified and location and outcrop information can be obtained from the SITES and OUTCROPS table, respectively.

SITEID: As for the RB_SR, U_PB and SHRIMP_AGES tables.

SAMPLEID: As for the RB_SR, U_PB and SHRIMP_AGES tables.

GEOL_AGE: Age of the sample (eg. emplacement or metamorphism) used for initial εNd calculation. It is mainly determined by isotope dating methods such as zircon U-Pb, and Rb-Sr isochrons. For some samples it is inferred from geological information.

EPSN_ND: Initial εNd value at the assigned geological age.

REFID: Mandatory pointer to an existing reference in the AGSOREFS table.

METHODNO: Optional pointer to a description of the analytical method in the METHODS table.

MINERAL: Optional field of up to 16 characters for indicating the material analysed - 'whole rock' or the name of the separated mineral.

SM_PPM: Optional. Mass abundance of samarium in parts per million.

ND_PPM: Optional. Mass abundance of neodymium in parts per million.

SM147ND144: Optional. The isotope ratio $^{147}Nd/^{144}Nd$.

ND143ND144: Optional. The isotope ratio $^{143}Nd/^{144}Nd$.

TDM: The depleted mantle (DM) model age in Ma.

COMMENTS: Optional 240-character field for any additional information.

RELEASED: The date the data were released for sale - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTRYDATE: As for the SITES, OUTCROPS and ROCKS tables - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

ENTEREDBY: As for the SITES, OUTCROPS and ROCKS tables.

LASTUPDATE: The date of the last update - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

SIGMA2X10_6: Uncertainty of measured $^{143}Nd/^{144}Nd$ value at the 95% confidence level.

RESTRICTED: A single-character field which may contain either 'U' or 'R' for unrestricted or restricted, respectively.

Section 3—Description of the Authority Tables

Note: the authority tables are listed in alphabetical order. Listings of the entries in the more commonly used authority tables are also given.

3.1 AGE_USED AUTHORITY TABLE

The AGE_USED authority table lists the isotope ratios that can be used to give the final age.

Code	*Isotope ratio*
1	6/38
2	7/6
3	208/232
4	207/235

3.2 AGSOAUTHS AUTHORITY TABLE

The AGSOAUTHS authority table is for the names of authors of references. Each record is one author and is linked to its reference in the AGSOREFS table by the refid.

Description of columns

REFID: Mandatory field of up to 9 characters. A monotonically increasing number which joins AGSOAUTHS to AGSOREFS.

AUTHORS: A mandatory field of 60 characters. The name of the author of the reference - with the surname first in lower case except for the first letter, followed by a space, a comma and the initials with full stops - for example, "Chowmondlier, K.L".

SEQUENCE: A mandatory integer of up to two digits indicating the order of the author in the reference list.

ENTEREDBY: The group or data base that entered the data.

ENTRYDATE: The date the record was entered - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

3.2 AGSOCOUNTRIES AUTHORITY TABLE

With a few minor additions, the countries and abbreviations used in this table are taken from Australian Standard 2632-1983 (Standards Association of Australia, 1983). Below is a listing of some of the entries in the AGSOCOUNTRIES authority table.

Countryid	*Countryname*
ATA	Antarctica
AUS	Australia
INA	Indonesia
INT	International Waters
NZL	New Zealand
PNG	Papua New Guinea
SLB	Solomon Islands

3.3 AGSOREFS AUTHORITY TABLE

The AGSOREFS authority table is for bibliographic references on either the source of the original data or some further information. This table is shared by all AGSO databases.

Description of columns

REFID: Mandatory field of up to 9 characters. A monotonically increasing primary key field assigned by the system.

OTHERID: Optional field of up to 16 characters. Any identifying sequence that the user may care to apply.

ENTEREDBY: The group or data base that entered the data.

YEAR: An optional 4-digit integer for the year of publication of the reference.

TITLE: An optional field of up 1024 characters for the title of the reference.

SOURCE: A mandatory field of up to 1024 characters for the publication details of the reference.

VOLPART: An optional field of up to 36 characters for the volume, issue or part of a serial reference.

PAGES: An optional field of up to 36 characters for the page range of articles in serials. The AGSO standard does not require total number of pages for monographs.

ENTRYDATE: The date the record was entered - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

3.4 AGSOSTATES AUTHORITY TABLE

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

Stateid	*Statename*
ACT	Australian Capital Territory
NSW	New South Wales
NT	Northern Territory
QLD	Queensland
SA	South Australia
TAS	Tasmania
VIC	Victoria
WA	Western Australia

3.5 AGSOMINERALS AUTHORITY TABLE

This table is a list of mineral names. The full AGSOMINERALS tables has 834 minerals. Only the 127 minerals flagged as 'C', for common mineral, are listed here. Minerals flagged 'O' are economic minerals. The flags are used to provide useful subsets of minerals for use within different databases.

MINABBREV	MINNAME	COMMON	ORE
ACT	actinolite	C	
AB	albite	C	
ALN	allanite	C	O
ALM	almandine	C	
ANL	analcime	C	
AN	anorthite	C	
ANR	anorthoclase	C	
ATH	anthophyllite	C	
AP	apatite	C	O
APY	arsenopyrite	C	O
AUG	augite	C	
AZ	azurite	C	O
BRT	barite	C	O
BRL	beryl	C	O
BT	biotite	C	
BN	bornite	C	O
BTW	bytownite	C	
CAL	calcite	C	
CARB	carbonate	C	
CST	cassiterite	C	O
CC	chalcocite	C	O
CCP	chalcopyrite	C	O
CL	chlorite	C	
CLD	chloritoid	C	
CHR	chromite	C	O
CIN	cinnabar	C	O
CLAY	clay mineral	C	O
CAMP	clino-amphibole	C	
CPX	clinopyroxene	C	
CZO	clinozoisite	C	
CRD	cordierite	C	
COR	corundum	C	O
CV	covellite	C	O
CRS	cristobalite	C	
CUM	cummingtonite	C	
CUP	cuprite	C	O
DMD	diamond	C	O
DI	diopside	C	
DOL	dolomite	C	O
EN	enstatite	C	
EP	epidote	C	
FY	fayalite	C	
FELD	feldspar	C	
FSPD	feldspathoid	C	
FL	fluorite	C	O
GN	galena	C	O
GNT	garnet	C	
GLT	glauconite	C	
GLN	glaucophane	C	
GT	goethite	C	O
GR	graphite	C	
GRS	grossular	C	
GP	gypsum	C	O
HL	halite	C	
HEM	hematite	C	O
HBL	hornblende	C	
ILL	illite	C	
ILM	ilmenite	C	O
JD	jadeite	C	O
KFS	k-feldspar	C	
KLN	kaolinite	C	O
KY	kyanite	C	O

MINABBREV	MINNAME	COMMON	ORE
LAB	labradorite	C	
LMT	laumontite	C	
LWS	lawsonite	C	
LCT	leucite	C	
MGS	magnesite	C	O
MGT	magnetite	C	O
MAL	malachite	C	O
MCS	marcasite	C	O
MICA	mica	C	O
MC	microcline	C	
MOL	molybdenite	C	O
MNZ	monazite	C	O
MNT	montmorillonite	C	
MS	muscovite	C	
NE	nepheline	C	
OGC	oligoclase	C	
OL	olivine	C	
OPL	opal	C	O
OPQ	opaque mineral	C	
OAMP	orthoamphibole	C	
OR	orthoclase	C	
OPX	orthopyroxene	C	
PHL	phlogopite	C	
PHOS	phosphate	C	O
PGT	pigeonite	C	
PL	plagioclase	C	
PRH	prehnite	C	
PMP	pumpellyite	C	
PY	pyrite	C	O
PRP	pyrope	C	
PRL	pyrophyllite	C	
PYRX	pyroxene	C	
PO	pyrrhotite	C	O
QZ	quartz	C	O
RDN	rhodonite	C	O
RT	rutile	C	O
SA	sanidine	C	
SCP	scapolite	C	
SCH	scheelite	C	O
SRL	schorl	C	
SERC	sericite	C	
SERP	serpentine	C	
SD	siderite	C	
SIL	sillimanite	C	
SPS	spessartine	C	
SP	sphalerite	C	O
SPL	spinel	C	
ST	staurolite	C	
STB	stibnite	C	O
STP	stilpnomelane	C	
TLC	talc	C	O
TTN	titanite	C	
TOZ	topaz	C	
TOUR	tourmaline	C	
TR	tremolite	C	O
TRD	tridymite	C	
USP	ulvospinel	C	
U	uranium	C	O
VRM	vermiculite	C	
VES	vesuvianite	C	
ZEOL	zeolite	C	
ZRN	zircon	C	O

3.6 COMMON_PB AUTHORITY TABLE

This table lists isotopes used for correcting for non-radiogenic lead in the sample.

Code	
1	207
2	204
3	208
4	uncorrected

3.7 CONTACTS AUTHORITY TABLE

This table of geological contact types is used by the INTERIZONS table (rectype 'CON').

ID	*Contactname*
1	faulted
2	gradational
3	unconformity
4	disconformity
5	nonconformity
6	intrusive

3.8 GEOPROVS AUTHORITY TABLE

This table lists geological provinces, subprovinces and domains. Granitic batholiths are listed as domains.

PROVNO	*PROVNAME*	*RANKNAME*	*PARENT*
0	unknown	Province	
1	Adavale Basin	Province	
2	Adelaide Fold Belt	Province	
3	Albany-Fraser Province	Province	
4	Amadeus Basin	Province	
5	Arafura Basin	Province	
6	Arckaringa Basin	Province	
7	Arnhem Block	Province	
8	Arrowie Basin	Province	
9	Arunta Block	Province	
10	Bancannia Trough	Province	
11	Bangemall Basin	Province	
12	Birrindudu Basin	Province	
13	Bonaparte Basin	Province	
14	Bowen Basin	Province	
15	Bremer Basin	Province	
16	Broken Hill Block	Province	
17	Canning Basin	Province	
18	Cape York-Oriomo Inlier	Province	
19	Carnarvon Basin	Province	
20	Carpentaria Basin	Province	
21	Clarence-Moreton Basin	Province	
22	Coen Block	Province	
23	Cooper Basin	Province	

PROVNO	PROVNAME	RANKNAME	PARENT
24	Daly River Basin	Province	
25	Darling Basin	Province	
26	Davenport Geosyncline	Province	
27	Denison Block	Province	
28	Drummond Basin	Province	
29	Duaringa Basin	Province	
30	Dundas Trough	Province	
31	Eromanga Basin	Province	
32	Esk Trough	Province	
33	Eucla Basin	Province	
34	Galilee Basin	Province	
35	Gascoyne Block	Province	
36	Gawler Craton	Province	
37	Georgetown Block	Province	
38	Georgina Basin	Province	
39	Gippsland Basin	Province	
40	Halls Creek Province	Province	
41	Hamersley Basin	Province	
42	Hillsborough Basin	Province	
43	Hodgkinson Fold Belt	Province	
44	Kanmantoo Fold Belt	Province	
45	Karumba Basin	Province	
46	Kimberley Basin	Province	
47	Lachlan Fold Belt	Province	
48	Laura Basin	Province	
49	Leeuwin Block	Province	
50	Litchfield Block	Province	
51	Maryborough Basin	Province	
52	McArthur Basin	Province	
53	Money Shoal Basin	Province	
54	Mount Isa Inlier	Province	
55	Mount Painter Block	Province	
56	Murphy Inlier	Province	
57	Murray Basin	Province	
58	Musgrave Block	Province	
59	Nabberu Basin	Province	
60	New England Fold Belt	Province	
61	Ngalia Basin	Province	
62	Northhampton Block	Province	
63	Oaklands Basin	Province	
64	Officer Basin	Province	
65	Ord Basin	Province	
66	Otway Basin	Province	
67	Paterson Province	Province	
68	Pedirka Basin	Province	
69	Perth Basin	Province	
70	Pilbara Block	Province	
71	Pine Creek Geosyncline	Province	
72	Polda Basin	Province	
73	Rocky Cape Block	Province	
74	Rum Jungle Block	Province	
75	South Nicholson Basin	Province	

PROVNO	PROVNAME	RANKNAME	PARENT
76	Stansbury Basin	Province	
77	Stuart Shelf	Province	
78	St Vincent Basin	Province	
79	Styx Basin	Province	
80	Surat Basin	Province	
81	Sydney Basin	Province	
82	Sylvania Dome	Province	
83	Tasmania Basin	Province	
84	Tennant Creek Block	Province	
85	Granites-Tanami Block	Province	
86	Torrens Basin	Province	
87	Tyenna Block	Province	
88	Victoria River Basin	Province	
89	Warburton Basin	Province	
90	Wiso Basin	Province	
91	Wonominta Block	Province	
92	Yambo Block	Province	
93	Yilgarn Craton	Super-province	
94	Eastern Goldfields Province	Province	Yilgarn Craton
95	Southern Cross Province	Province	Yilgarn Craton
96	Eastern Fold Belt	Sub-province	Mount Isa Inlier
97	Cloncurry-Selwyn Zone	Domain	Eastern Fold Belt
99	East Kimberley	Sub-province	Kimberley Basin
100	North Kimberley	Sub-province	Kimberley Basin
101	West Kimberley	Sub-province	Kimberley Basin
108	Willyama Block	Province	
112	Ashburton Basin	Province	
113	Glengary Sub-basin		
114	Eraheedy Sub-basin		
115	Westmoreland Region		
116	Ammaroodinna Inlier		
117	Curnamona Craton		
118	Houghton Inlier		
119	Mullingarra		
120	Murchison Province	Province	Yilgarn Craton
121	Western Gneiss Terrane	Province	Yilgarn Craton
122	Mendlyarri Batholith	Domain	Eastern Goldfields Province
123	Boorabbin Batholith	Domain	Eastern Goldfields Province
124	Boyce Batholith	Domain	Eastern Goldfields Province
126	Northern Province	Sub-province	Arunta Block
127	Central Province	Sub-province	Arunta Block
128	Southern Province	Sub-province	Arunta Block
129	Chewings Zone	Domain	Southern Province
130	Redbank Thrust Zone	Domain	Central Province
131	Halls Creek Inlier	Sub-province	Halls Creek Province
132	King Leopold Inlier	Sub-province	Halls Creek Province
133	Batten Trough	Sub-province	McArthur Basin
134	Bauhinia Shelf	Sub-province	McArthur Basin
135	Wearyan Shelf	Sub-province	McArthur Basin
136	Arnhem Shelf	Sub-province	McArthur Basin
137	Caledon Shelf	Sub-province	McArthur Basin
138	Urapunga Tectonic Ridge	Sub-province	McArthur Basin

PROVNO	PROVNAME	RANKNAME	PARENT
139	Walker Trough	Sub-province	McArthur Basin
141	Kalkadoon-Leichhardt Belt	Sub-province	Mount Isa Inlier
142	Western Fold Belt	Sub-province	Mount Isa Inlier
143	Mary Kathleen Zone	Domain	Eastern Fold Belt
144	Quamby-Malbon Zone	Domain	Eastern Fold Belt
145	Lawn Hill Platform	Domain	Western Fold Belt
146	Leichhardt River Fault Trough	Domain	Western Fold Belt
147	Ewen Block	Domain	Western Fold Belt
148	Myally Shelf	Domain	Western Fold Belt
149	Bass Strait Batholith	Domain	Lachlan Fold Belt
150	Bathurst Batholith	Domain	Lachlan Fold Belt
151	Bega Batholith	Domain	Lachlan Fold Belt
152	Berridale Batholith	Domain	Lachlan Fold Belt
153	Blue Tier Batholith	Domain	Lachlan Fold Belt
154	Bonang Batholith	Domain	Lachlan Fold Belt
155	Central Victorian Batholith	Domain	Lachlan Fold Belt
156	Cooma Batholith	Domain	Lachlan Fold Belt
157	Corryong Batholith	Domain	Lachlan Fold Belt
158	Furneaux Batholith	Domain	Lachlan Fold Belt
159	Gabo Island Batholith	Domain	Lachlan Fold Belt
160	Gingera Batholith	Domain	Lachlan Fold Belt
161	Grenfell Batholith	Domain	Lachlan Fold Belt
162	Gulgong Batholith	Domain	Lachlan Fold Belt
163	Kosciusko Batholith	Domain	Lachlan Fold Belt
164	Maragle Batholith	Domain	Lachlan Fold Belt
165	Marulan Batholith	Domain	Lachlan Fold Belt
166	Moruya Batholith	Domain	Lachlan Fold Belt
167	Murrumbidgee Batholith	Domain	Lachlan Fold Belt
168	Oberon Batholith	Domain	Lachlan Fold Belt
169	Promontory Batholith	Domain	Lachlan Fold Belt
170	Scottsdale Batholith	Domain	Lachlan Fold Belt
171	Taswegia Batholith	Domain	Lachlan Fold Belt
172	Tumut Batholith	Domain	Lachlan Fold Belt
173	Wagga Batholith	Domain	Lachlan Fold Belt
174	Western Victoria Batholith	Domain	Lachlan Fold Belt
175	Wologorong Batholith	Domain	Lachlan Fold Belt
176	Wyangala Batholith	Domain	Lachlan Fold Belt
177	Yeoval Batholith	Domain	Lachlan Fold Belt
178	Young Batholith	Domain	Lachlan Fold Belt
179	Big Toby Batholith	Domain	Western Fold Belt
181	Ewen Batholith	Domain	Western Fold Belt
182	Kalkadoon Batholith	Domain	Kalkadoon-Leichhardt Belt
183	Naraku Batholith	Domain	Eastern Fold Belt
184	Sybella Batholith	Domain	Western Fold Belt
185	Weberra Batholith	Domain	Western Fold Belt
186	Williams Batholith	Domain	Eastern Fold Belt
187	Wonga Batholith	Domain	Kalkadoon-Leichhardt Belt
188	Coen Subprovince	Sub-province	Coen Block
189	Georgetown Inlier	Sub-province	Georgetown Block
190	Cape York Peninsula Batholith	Domain	Coen Siluro-Devonian Subprovince
191	Cape York Plutonic Belt	Province	
192	Broken River Province	Province	

PROVNO	PROVNAME	RANKNAME	PARENT
193	North Queensland Igneous Province	Province	
195	Drummond Carboniferous-Permian Subprovince	Sub-province	North Queensland Igneous Province
196	Broken River Carboniferous-Permian Subprovince	Sub-province	North Queensland Igneous Province
197	Hodgkinson Carboniferous-Permian Subprovince	Sub-province	North Queensland Igneous Province
198	Ravenswood Carboniferous-Permian Subprovince	Sub-province	North Queensland Igneous Province
200	Connors Arch Subprovince	Sub-province	New England Fold Belt
201	Croydon Block	Sub-province	Georgetown Block
202	Dargalong Inlier	Sub-province	Georgetown Block
203	Greenvale Subprovince	Sub-province	Broken River Province
204	Lolworth-Ravenswood Block	Province	
205	Einasleigh Siluro-Devonian Subprovince	Sub-province	Cape York Plutonic Belt
207	Georgetown Carboniferous-Permian Subprovince	Sub-province	North Queensland Igneous Province
208	Croydon Cauldron	Domain	Croydon Block
209	Featherbed Cauldron Complex	Domain	Hodgkinson Carboniferous-Permian Subprovince
210	Woolgar Inlier	Domain	Einasleigh Subprovince
211	Coen Siluro-Devonian Subprovince	Sub-province	Cape York Plutonic Belt
212	Georgetown Siluro-Devonian Subprovince	Sub-province	Cape York Plutonic Belt
213	Coen Carboniferous-Permian Subprovince	Sub-province	North Queensland Igneous Province
214	Einasleigh Carboniferous-Permian Subprovince	Sub-province	North Queensland Igneous Province
215	Einasleigh Subprovince	Sub-province	Georgetown Block
216	Darling Range Batholith	Domain	Western Gneiss Terrane
217	Mount Sterling Batholith	Domain	Eastern Goldfields Province
218	Raeside Batholith	Domain	Eastern Goldfields Province
219	Lolworth Subprovince	Sub-province	Thompson Fold Belt
220	Thompson Fold Belt	Province	
221	Ravenswood (Ordovician) Subprovince	Sub-province	Thompson Fold Belt
222	Ravenswood Siluro-Devonian Subprovince	Sub-province	Cape York Plutonic Belt
224	Coolgarra Batholith	Domain	Hodgkinson Carboniferous-Permian Subprovince
225	Copperfield Batholith	Domain	Georgetown Siluro-Devonian Subprovince
226	Esmeralda Batholith	Domain	Croydon Block
227	Forsayth Batholith	Domain	Georgetown Inlier
228	Glenmore Batholith	Domain	Einasleigh Subprovince
229	Lolworth Batholith	Domain	Lolworth Subprovince
230	Mossman Batholith	Domain	Hodgkinson Carboniferous-Permian Subprovince
231	Mount Storth Batholith	Domain	Connors Arch Subprovince
232	Northern Tate Batholith	Domain	Hodgkinson Carboniferous-Permian Subprovince

PROVNO	PROVNAME	RANKNAME	PARENT
233	Ravenswood Batholith	Domain	Ravenswood Siluro-Devonian Subprovince
234	Robin Hood Batholith	Domain	Georgetown Siluro-Devonian Subprovince
235	Urannah Batholith	Domain	Connors Arch Subprovince
236	White Springs Batholith	Domain	Georgetown Siluro-Devonian Subprovince
238	Burnside Batholith	Domain	Albany-Fraser Province
239	Chiratta Batholith	Domain	Pilbara Block
240	Mount Edgar Batholith	Domain	Pilbara Block
241	Cullen Batholith	Domain	Pine Creek Geosyncline
242	Litchfield Batholith	Domain	Pine Creek Geosyncline
243	Landor Batholith	Domain	Gascoyne Block
244	Minnie Creek Batholith	Domain	Gascoyne Block
245	Mount Marquis Batholith	Domain	Gascoyne Block
246	Dido Batholith	Domain	Einasleigh Siluro-Devonian Subprovince
268	Ingham Batholith	Domain	Hodgkinson Carboniferous-Permian Subprovince
269	Tully Batholith	Domain	Hodgkinson Carboniferous-Permian Subprovince
270	Malbon Thompson Batholith	Domain	North Queensland Igneous Province
271	Tinaroo Batholith	Domain	Hodgkinson Carboniferous-Permian Subprovince
272	Mareeba Batholith	Domain	Hodgkinson Carboniferous-Permian Subprovince
273	Windsor Batholith	Domain	Hodgkinson Carboniferous-Permian Subprovince
274	Thornton Batholith	Domain	Hodgkinson Carboniferous-Permian Subprovince
275	Finlayson Batholith	Domain	Hodgkinson Carboniferous-Permian Subprovince
276	Tate Batholith	Domain	Hodgkinson Carboniferous-Permian Subprovince
277	Kelly Saint George Batholith	Domain	Hodgkinson Carboniferous-Permian Subprovince
278	Bellenden Ker Batholith	Domain	Hodgkinson Carboniferous-Permian Subprovince
279	Norseman-Wiluna Belt	Domain	Eastern Goldfields Province
280	Kalinjala Mylonitic Zone	Sub-domain	Gawler Craton
281	Lakefield Basin	Province	
282	Fly-Highlands Province	Province	
283	Tertiary Volcanic Province	Province	
303	Maer	Sub-province	Tertiary Volcanic Province
304	Silver Plains, Piebald, and McLean	Sub-province	Tertiary Volcanic Province
305	Atherton	Sub-province	Tertiary Volcanic Province
306	Wallaroo	Sub-province	Tertiary Volcanic Province
307	McBride	Sub-province	Tertiary Volcanic Province
308	Chudleigh	Sub-province	Tertiary Volcanic Province
309	Sturgeon	Sub-province	Tertiary Volcanic Province
310	Nulla	Sub-province	Tertiary Volcanic Province
311	Mingella	Sub-province	Tertiary Volcanic Province
312	Hillsborough	Sub-province	Tertiary Volcanic Province
313	Nebo	Sub-province	Tertiary Volcanic Province
314	Peak Range	Sub-province	Tertiary Volcanic Province
315	Hoy	Sub-province	Tertiary Volcanic Province
316	Springsure	Sub-province	Tertiary Volcanic Province
317	Buckland and Mitchell	Sub-province	Tertiary Volcanic Province

PROVNO	PROVNAME	RANKNAME	PARENT
318	Bauhinia	Sub-province	Tertiary Volcanic Province
319	Monto	Sub-province	Tertiary Volcanic Province
320	Bundaberg and Boyne	Sub-province	Tertiary Volcanic Province
321	Glass Houses	Sub-province	Tertiary Volcanic Province
322	Main Range	Sub-province	Tertiary Volcanic Province
323	Brisbane	Sub-province	Tertiary Volcanic Province
324	Focal Peak	Sub-province	Tertiary Volcanic Province
325	Tweed	Sub-province	Tertiary Volcanic Province
339	Nandewar	Sub-province	Tertiary Volcanic Province
340	Central and Doughboy	Sub-province	Tertiary Volcanic Province
341	Ebor	Sub-province	Tertiary Volcanic Province
342	Warrumbungle	Sub-province	Tertiary Volcanic Province
343	Liverpool Range	Sub-province	Tertiary Volcanic Province
344	Walcha	Sub-province	Tertiary Volcanic Province
345	Barrington	Sub-province	Tertiary Volcanic Province
346	Comboyne	Sub-province	Tertiary Volcanic Province
347	Dubbo	Sub-province	Tertiary Volcanic Province
348	Canobolas	Sub-province	Tertiary Volcanic Province
349	Sydney	Sub-province	Tertiary Volcanic Province
350	Southern Highlands, Grabben Gullen, Abercrombie, and Kandos	Sub-province	Tertiary Volcanic Province
351	Monaro, Snowy Mountains, and South Coast	Sub-province	Tertiary Volcanic Province
352	East Australian leucitite suite	Sub-province	Tertiary Volcanic Province
353	Older Volcanics	Sub-province	Tertiary Volcanic Province
354	Macedon-Trentham	Sub-province	Tertiary Volcanic Province
355	Newer Volcanics	Sub-province	Tertiary Volcanic Province
356	Tasmania & Bass Strait	Sub-province	Tertiary Volcanic Province
357	New Zealand Intraplate Volcanic Province	Province	
358	Northland	Sub-province	New Zealand Intraplate Volcanic Province
359	Auckland	Sub-province	New Zealand Intraplate Volcanic Province
360	Canterbury & Marlborough	Sub-province	New Zealand Intraplate Volcanic Province
368	Timaru and Geraldine	Sub-province	New Zealand Intraplate Volcanic Province
369	North Otago	Sub-province	New Zealand Intraplate Volcanic Province
370	Dunedin Volcanic Group	Sub-province	New Zealand Intraplate Volcanic Province
371	Alpine Dyke Swarm	Sub-province	New Zealand Intraplate Volcanic Province
373	South Westland	Sub-province	New Zealand Intraplate Volcanic Province
374	Lake Eyre Basin	Province	
375	Dumbano Batholith	Domain	Georgetown Siluro-Devonian Subprovince

3.9 GEOREGIONS AUTHORITY TABLE

Geological regions recorded in the SITES table are based on Palfreyman's Geological provinces (see Palfreyman, 1984). They indicate the geographical region in which the sample was collected, unlike the geological provinces in the ROCKS table which are specific to the geological unit. Geological regions cater for drill holes which are, for example, collared in the Karumba Basin and extend into the Proterozoic basement, or samples which are collected at an unconformity between to geological provinces. The site location could be either province however, geologically each sample can only come from one province.

NO	GEOLOGICAL REGION	COUNTRY
0	unknown	AUS
1	Adavale Basin	AUS
2	Adelaide Fold Belt	AUS
3	Albany-Fraser Province	AUS
4	Amadeus Basin	AUS
5	Arafura Basin	AUS
6	Arckaringa Basin	AUS
7	Arnhem Block	AUS
8	Arrowie Basin	AUS
9	Arunta Block	AUS
10	Bancannia Trough	AUS
11	Bangemall Basin	AUS
12	Birrindudu Basin	AUS
13	Bonaparte Basin	AUS
14	Bowen Basin	AUS
15	Bremer Basin	AUS
16	Broken Hill Block	AUS
17	Canning Basin	AUS
18	Cape York-Oriomo Inlier	AUS
19	Carnarvon Basin	AUS
20	Carpentaria Basin	AUS
21	Clarence-Moreton Basin	AUS
22	Coen Block	AUS
23	Cooper Basin	AUS
24	Daly River Basin	AUS
25	Darling Basin	AUS
26	Davenport Geosyncline	AUS
27	Denison Block	AUS
28	Drummond Basin	AUS
29	Duaringa Basin	AUS
30	Dundas Trough	AUS
31	Eromanga Basin	AUS
32	Esk Trough	AUS
33	Eucla Basin	AUS
34	Galilee Basin	AUS
35	Gascoyne Block	AUS
36	Gawler Block	AUS
37	Georgetown Block	AUS
38	Georgina Basin	AUS
39	Gippsland Basin	AUS
40	Halls Creek Province	AUS
41	Hamersley Basin	AUS
42	Hillsborough Basin	AUS
43	Hodgkinson Fold Belt	AUS
44	Kanmantoo Fold Belt	AUS
45	Karumba Basin	AUS
46	Kimberley Basin	AUS
47	Lachlan Fold Belt	AUS
48	Laura Basin	AUS
49	Leeuwin Block	AUS

NO	GEOLOGICAL REGION	COUNTRY
50	Litchfield Block	AUS
51	Maryborough Basin	AUS
52	McArthur Basin	AUS
53	Money Shoal Basin	AUS
54	Mount Isa Inlier	AUS
55	Mount Painter Block	AUS
56	Murphy Inlier	AUS
57	Murray Basin	AUS
58	Musgrave Block	AUS
59	Nabberu Basin	AUS
60	New England Fold Belt	AUS
61	Ngalia Basin	AUS
62	Northhampton Block	AUS
63	Oaklands Basin	AUS
64	Officer Basin	AUS
65	Ord Basin	AUS
66	Otway Basin	AUS
67	Paterson Province	AUS
68	Pedirka Basin	AUS
69	Perth Basin	AUS
70	Pilbara Block	AUS
71	Pine Creek Geosyncline	AUS
72	Polda Basin	AUS
73	Rocky Cape Block	AUS
74	Rum Jungle Block	AUS
75	South Nicholson Basin	AUS
76	Stansbury Basin	AUS
77	Stuart Shelf	AUS
78	St Vincent Basin	AUS
79	Styx Basin	AUS
80	Surat Basin	AUS
81	Sydney Basin	AUS
82	Sylvania Dome	AUS
83	Tasmania Basin	AUS
84	Tennant Creek Block	AUS
85	Granites-Tanami Block	AUS
86	Torrens Basin	AUS
87	Tyenna Block	AUS
88	Victoria River Basin	AUS
89	Warburton Basin	AUS
90	Wiso Basin	AUS
91	Wonominta Block	AUS
92	Yambo Block	AUS
93	Yilgarn Block	AUS
108	Willyama Block	AUS
112	Ashburton Basin	AUS
282	Fly-Highlands Province	PNG
283	Tertiary Volcanic Province	AUS
357	New Zealand Intraplate Volcanic Province	NZL

3.10 GEOTIME AUTHORITY TABLE

This authority table lists geological time terms.

Description of columns

AGENO: A mandatory integer of up to 4 digits automatically allocated by the system.

AGENAME: Mandatory field of 24 characters for the name of the geological age or time term: e.g. 'Permian'.

RANK: Mandatory single-integer field indicating the Rank of the time term. The current rank terms from the TIMERANKS table are as follows:

Rankno	*Rank*
1	Eon
2	Erathem
3	Period
4	Epoch
5	Series
6	Stage
7	Substage
8	Unknown

SCOPE: Mandatory single-integer field indicating the Scope of the time term: i.e., to what regions does the term apply. For example, the Australian Ordovician Stage names are also used in new Zealand, so the Scope Description is given as Australasian. The following values are currently valid timescopes in the TIMESCOPE authority table:

Scopeno	*Description*
1	International
2	Australia
3	Australasia
4	New Zealand
5	United Kingdom
6	North America
7	China

STATUS:Mandatory single-integer field indicating the Status of a time term. There are only three records at present in the TIMESTATUS authority table:

Statusno	*Description*
1	Current
2	Obsolete
3	Deleted

PARENT: An integer of up to 4 digits that points to the Age Number of the term next higher in Rank in the GEOTIME table. For example, the parent age for the Ordovician Period is the Palaeozoic Era.

YNGBOUND: An 8-digit number field for the absolute youngest age of the geologic time term in million years.

OLDBND: An 8-digit number field for the absolute oldest age of the geologic time term in million years.

COMMENTS: An optional 64-character field for any additional comments.

GEODXID: A field of up to 6 characters for the GEODX Reference ID of the primary reference to the time term. This is usually the most authoritative reference to the absolute age boundaries of the unit.

LASTALT: Date field - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92', in which the current date is automatically inserted whenever a new record is entered or an old one updated.

3.11 HMAPS AUTHORITY TABLE

The HMAPS table is an authority table for 1:100 000 Map sheet areas.

Description of columns

HMAPNO: This unique four-digit number identifies any 1:100 000 Australian map.

MMAPID: 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 digits, e.g., 'SF54'. The two digits are the UTM zone, which is needed to convert metric references to latitude and longitude.

QMAPNO: Up to 2 digits identifying the 1:250 000 map sheet from the 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.

HMAPNAME: A field of up to 22 upper case characters for the name of the 1:100 000 map sheet identified by the 1:100 000 Map Number. There are many offshore sheets which are identified as 'UNNAMED'.

N_LAT: The latitude of the northwest corner of the 1:100 000 map sheet in degrees and decimal degrees.

W_LONG: The longitude of the northwest corner of the 1:100 000 map sheet in decimal degrees.

MEAST: The metric easting of the southeast corner of the 1:100 000 map sheet.

MNORTH: The metric northing of the southeast corner of the 1:100 000 map sheet.

STATE1: A three character field for the abbreviation of the state in which the 1:100 000 map sheet is located. Valid state abbreviations are derived from the AGSOSTATES authority table. If the map sheet straddles a border the state which covers the most area on the map sheet is recorded in this field.

STATE2: A three-character field for the abbreviation of the state name, which is only used for 1:100 000 map sheets which straddle a border. The state with the least area on the map sheet is recorded in this field. Valid state abbreviations are derived from the AGSOSTATES authority table.

3.12 IZ_RECTYPES AUTHORITY TABLE

This is the authority table of record types for the INTERIZONS table.

Rectype	*Recname*
LTH	Lithology
STR	Structure
STD	STRATDAT Datum
RUB	RockUnitBoundary
SVY	Survey
CON	Contact type

3.13 LANDF AUTHORITY TABLE

This is the authority table for landforms.

L_CODE	LANDFORM
CO00	coastal lands
CO01	beach ridge
CO02	chenier plain
CO03	coral reef
CO04	marine plain
CO05	tidal flat
CO06	coastal dunes
DE00	delta
DU00	dunefield
ER00	erosional landforms
ER10	erosional plain
ER11	pediment
ER12	pediplain
ER13	peneplain
ER20	rises
ER30	low hills
ER40	hills
FA00	fan
FA01	alluvial fan
FA02	colluvial fan
FA03	sheet-flood fan
PL00	plain
PL01	depositional plain
PL02	lacustrine plain
PL03	playa plain
AL00	alluvial landforms
ER21	residual rise
ER31	residual low hill
PT01	plateau edge
PT02	plateau surface
CO07	coastal plain
AL16	floodout
VO05	lava flow
VO06	lava plateau
GL00	glacial features

L_CODE	LANDFORM
AL10	alluvial plain
AL11	flood plain
AL12	anastomatic plain
AL13	bar plain
AL14	covered plain
AL30	stagnant alluvial plain
AL40	terraced land
AL20	alluvial terrace
VO00	volcano
VO01	caldera
VO02	cone (volcanic)
VO03	lava plain
VO04	ash plain
PT00	plateau
KA00	karst
MA00	made land
ME00	meteor crater
ER50	mountains
ER60	escarpment
ER70	badlands
AL15	meander plain
ER14	etchplain
PL04	sand plain
AL50	alluvial swamp
DU01	longitudinal dune field
ER80	drainage depression
GL10	depositional glacial features
GL20	erosional glacial features
CO08	beach

3.14 LITHDATATYPES AUTHORITY TABLE

This is the authority table for lithdatatypes. Each data type has many subtypes.

DATATYPE	*TYPEDESC*
ALT	Ateration
BED	Bedding Thickness
CM	Common Mineral
COH	Coherence
COL	Colour
FOS	Fossil
GS	Grain Size
IS	Internal Stratification
IOM	Igneous Occurrence Mode
ITX	Igneous Texture
MAG	Magnetic susceptibility. (SI Units x 10^{-5})
MET	Metamorphic Grade
MI	Mineral
MTX	Metamorphic Texture
PHO	Photodata
RAD	Gamma Ray Spectrometry (counts per second)
REF	Reference
REM	Remarks
SEQ	Sequence Types
SF	Sampled For
SOM	Sedimentary Occurrence Mode
SOR	Sorting
SP	Sample Provenance
SPH	Sphericity
SS	Sedimentary Structures
ST	Sample Type
STX	Sedimentary Texture
TEC	Tectonic Features
WEA	Weathering

3.15 LITHOLOGIES AUTHORITY TABLE

This is the authority table of lithological names and qualifiers.

LITHID	*QUALIFIER*	*LITHNAME*	*PARENT*	*ROCKTYPE*
BX	H	breccia		
CLAS	H	clast		
GOUG	H	gouge		
MTX	H	matrix		
ORE	H	ore		
ROCK	H	rock		
SED	H	sediment		
VEIN	H	vein		
ADK	I	adakite		
AGL	I	agglomerate		
ALB	I	albitite		15

LITHID	QUALIFIER	LITHNAME	PARENT	ROCKTYPE
AFG	I	alkali feldspar granite	GRT	2
AFS	I	alkali feldspar syenite	SYN	3
ALO	I	alnoite	LPY	9
AGB	I	analcime gabbro = teschenite	GAB	9
ANA	I	analcimite	FDT	9
ANT	I	andesite		6
ANS	I	anorthosite		2
APL	I	aplite		2
ASH	I	ash		
BLT	I	basalt		7
BAD	I	basaltic andesite		6
BTA	I	basaltic trachyandesite		6
BSN	I	basanite		9
BMT	I	benmoreite	TYA	6
BTH	I	bomb, block tephra	TPH	
BON	I	boninite		6
CCT	I	calciocarbonatite	CBT	9
CMP	I	camptonite	LPY	9
CBT	I	carbonatite		9
CHAR	I	charnockite		2
CHT	I	chromitite		8
CPN	I	clinopyroxene norite	NRT	4
CPT	I	clinopyroxenite	PRX	8
COM	I	comendite	RHY	9
DAC	I	dacite		5
DRT	I	diorite		3
DLT	I	dolerite	GAB	4
DUN	I	dunite	PER	8
FNT	I	fenite		15
FCT	I	ferrocarbonatite	CBT	9
FFS	I	foid-bearing alkali feldspar sye	SYN	9
FAT	I	foid-bearing alkali feldspar tra	TRC	9
FAN	I	foid-bearing anorthosite	ANS	9
FDR	I	foid-bearing diorite	DRT	9
FBG	I	foid-bearing gabbro	GAB	9
FLT	I	foid-bearing latite	TYA	9
FMD	I	foid-bearing monzodiorite	MZD	9
FMG	I	foid-bearing monzogabbro	MZB	9
FBM	I	foid-bearing monzonite	MZT	9
FSY	I	foid-bearing syenite	SYN	9
FTR	I	foid-bearing trachyte	TRC	9
FDI	I	foid-diorite	DRT	9
FDT	I	foidite		9
FDL	I	foidolite		9
GAB	I	gabbro		4
GBN	I	gabbronorite	GAB	4
GRT	I	granite		2
GRD	I	granodiorite		2
GRP	I	granophyre		2
HZB	I	harzburgite	PER	8
HWT	I	hawaiite	TYB	7
HDG	I	hornblende gabbro	GAB	4

LITHID	QUALIFIER	LITHNAME	PARENT	ROCKTYPE
HBT	I	hornblendite		8
HYA	I	hyaloclastite		
IGM	I	ignimbrite	TUF	
IJL	I	ijolite	FDL	9
KZT	I	kersantite	LPY	9
KBL	I	kimberlite		9
KTT	I	komatiite		8
LPR	I	lamproite		9
LPY	I	lamprophyre		9
LTT	I	latite	TYA	6
LAVA	I	lava		
LCTT	I	leucitite	FDT	9
LHZ	I	lherzolite	PER	8
LBG	I	limburgite	BSN	9
MCT	I	magnesiocarbonatite	CBT	9
MCH	I	meimechite		8
MPD	I	melilite-bearing peridotite	MLT	9
MPT	I	melilite-bearing pyroxenite	MLT	9
MUV	I	melilite-bearing ultramafic volc	MLT	9
MLT	I	melilitite		9
MLL	I	melilitolite		9
MLG	I	melteigite	FDT	9
MSK	I	miaskite	MSYN	9
MNTT	I	minette	LPY	9
MSS	I	missourite	FDL	9
MCQ	I	monchiquite	LPY	9
MZD	I	monzodiorite		3
MZB	I	monzogabbro		4
MZG	I	monzogranite	GRT	2
MZT	I	monzonite		3
MSYN	I	monzosyenite		9
MUG	I	mugearite	BTA	6
NGB	I	nepheline gabbro = theralite	GAB	9
NMD	I	nepheline monzodiorite = essexit	MZD	9
NMG	I	nepheline monzogabbro = essexite	MZB	9
NSY	I	nepheline syenite	SYN	9
NPH	I	nephelinite	FDT	9
NLL	I	nephelinolite	FDL	9
NRT	I	norite	GAB	4
OBS	I	obsidian		5
OCP	I	olivine clinopyroxenite	PRX	8
OHP	I	olivine hornblende pyroxenite	PRX	8
OHT	I	olivine hornblendite	HBT	8
OMT	I	olivine melilitite	MLT	9
OML	I	olivine melilitolite	MLL	9
OOP	I	olivine orthopyroxenite	PRX	8
OWT	I	olivine websterite	PRX	8
OPHL	I	ophiolite		7
OFG	I	opx alkali feldspar granite	GRT	2
OFS	I	opx alkali feldspar syenite	SYN	3
ODT	I	opx diorite = norite	DRT	3
OGT	I	opx granite = charnockite	GRT	2

LITHID	QUALIFIER	LITHNAME	PARENT	ROCKTYPE
OGD	I	opx granodiorite = opdalite	GRD	2
OMD	I	opx monzodiorite = jotunite	MZD	3
OMZ	I	opx monzonite = mangerite	MZT	3
OST	I	opx syenite	SYN	3
OTT	I	opx tonalite = enderbite	TNL	2
OPT	I	orthopyroxenite	PRX	8
PTT	I	pantellerite	RHY	9
PEG	I	pegmatite		2
PKR	I	peralkaline rhyolite	RHY	9
PER	I	peridotite		8
PNT	I	phonolite		9
PBS	I	phonolitic basanite	BSN	9
PFD	I	phonolitic foidite	FDT	9
PTR	I	phonolitic tephrite	TPT	9
PCT	I	picrite		7
PBT	I	picrobasalt	BLT	8
PHD	I	plagioclase-bearing hornblendite	HBT	8
PPX	I	plagioclase-bearing pyroxenite	PRX	8
PLZ	I	polzenite	LPY	9
PHY	I	porphyry		
PTB	I	potassic trachybasalt	TYB	7
PHG	I	pyroxene hornblende gabbro	GAB	4
PHP	I	pyroxene hornblende peridotite	PER	8
PHT	I	pyroxene hornblendite	HBT	8
PML	I	pyroxene melilitolite	MLL	9
POM	I	pyroxene olivine melilitolite	MLL	9
PPD	I	pyroxene peridotite	PER	8
PRX	I	pyroxenite		8
QAS	I	quartz alkali feldspar syenite	SYN	3
QZA	I	quartz anorthosite	ANS	2
QZD	I	quartz diorite	DRT	3
QGB	I	quartz gabbro	GAB	4
QZL	I	quartz latite	TYA	6
QMD	I	quartz monzodiorite	MZD	3
QMG	I	quartz monzogabbro	MZB	4
QZM	I	quartz monzonite	MZT	3
QZS	I	quartz syenite	SYN	3
QTY	I	quartz trachyte	TRC	5
QZG	I	quartz-rich granitoid		2
QTE	I	quartzolite	QZG	15
RHD	I	rhyodacite	DAC	5
RHY	I	rhyolite		5
SAN	I	sannaite	LPY	9
SHK	I	shonkinite	SYN	9
SHT	I	shoshonite	BTA	6
SMD	I	sodalite monzodiorite	MZD	9
SSY	I	sodalite syenite	SYN	9
SDT	I	sodalitite	FDT	9
SPT	I	spessartite	LPY	9
SPIL	I	spilite		7
SYN	I	syenite		3

LITHID	QUALIFIER	LITHNAME	PARENT	ROCKTYPE
SYG	I	syenogranite	GRT	2
TPH	I	tephra		
TPT	I	tephrite		9
TFD	I	tephritic foidite	FDT	9
TPL	I	tephritic phonolite	PNT	9
TNL	I	tonalite		2
TYA	I	trachyandesite		6
TYB	I	trachybasalt		7
TYD	I	trachydacite	DAC	5
TRC	I	trachyte		6
TTL	I	troctolite	GAB	4
TDJ	I	trondhjemite	TNL	2
TUF	I	tuff		
TFT	I	tuffite		
URT	I	urtite	FDL	9
GT	I	vogesite	LPY	9
WEB	I	websterite	PRX	8
WHL	I	wehrlite	PER	8
AMP	M	amphibolite		12
EGL	M	eclogite		12
GNS	M	gneiss		13
GFL	M	granofels		
GRN	M	granulite		
GST	M	greenstone		12
GRSN	M	greisen		15
HFL	M	hornfels		
MBL	M	marble		14
METB	M	metabasite		
MTS	M	metasomatite		15
MIG	M	migmatite		13
MYL	M	mylonite		
PHYL	M	phyllite		14
QZT	M	quartzite		14
SCHT	M	schist		
SRP	M	serpentinite		12
SKN	M	skarn		15
SLA	M	slate		14
ADC	Q	adcumulate		
AGAL	Q	agal		
ALK	Q	alkali		
ALT	Q	altered		
AMY	Q	amygdaloidal		
APH	Q	aphanitic		
ARE	Q	arenaceous		
AR	Q	argillic		
ARK	Q	arkosic		
BA	Q	banded		
BLTC	Q	basaltic		
BAS	Q	basic		
BED	Q	bedded		
BTM	Q	bitumenous		
BO	Q	bouldery		
BR	Q	brecciated		

LITHID	QUALIFIER	LITHNAME	PARENT	ROCKTYPE
CS	Q	calc-silicate		
CALC	Q	calcareous		
CLC	Q	calcic		
CAR	Q	carbonaceous		
CA	Q	carbonate		
CHEM	Q	chemical		
CHY	Q	cherty		
CLT	Q	chloritic		
CLAC	Q	clastic		
C	Q	coarse		
CGC	Q	conglomeratic		
XL	Q	crystal		
CUMM	Q	cumulate		
CYC	Q	cyclic		
DK	Q	dark		
DIA	Q	diapiric		
DMT	Q	dolomitic		
EPC	Q	epiclastic		
EU	Q	eutaxitic		
EXV	Q	extrusive		
FA	Q	fault		
FOI	Q	feldspathoidal		
FEL	Q	feldspathic		
FLS	Q	felsic		
FER	Q	ferruginous		
FIA	Q	fiamme		
F	Q	fine		
FLAG	Q	flaggy		
FOID	Q	foid		
FO	Q	foliated		
FR	Q	fractured		
FRI	Q	friable		
GL	Q	glassy		
GRAN	Q	granitic		
GPT	Q	graphitic		
GTY	Q	gritty		
HM	Q	hematitic		
HET	Q	heterolithic		
HK	Q	high-K		
HMG	Q	high-Mg		
HGR	Q	high-grade		
ITM	Q	intermediate		
ITV	Q	intrusive		
KA	Q	kaolinised		
LA	Q	laminated		
LPL	Q	lapilli		
LAT	Q	lateritic		
LAY	Q	layered		
LCC	Q	leucocratic		
LT	Q	light		
LTH	Q	lithic		

LITHID	QUALIFIER	LITHNAME	PARENT	ROCKTYPE
LK	Q	low-K		
LGR	Q	low-grade		
MAF	Q	mafic		
MGSN	Q	magnesian		
MAS	Q	massive		
MK	Q	medium-K		
MEG	Q	megacrystic		
MCC	Q	melanocratic		
MCL	Q	mesocumulate		
MET	Q	meta		
MIC	Q	micaceous		
MX	Q	microcrystalline		
MDY	Q	muddy		
MY	Q	mylonitic		
OO	Q	oolitic		
ORG	Q	organic		
ORT	Q	ortho		
OCL	Q	orthocumulate		
PALE	Q	pale		
PAR	Q	para		
PBY	Q	pebbly		
PEL	Q	pelitic		
PERA	Q	peralkaline		
PHC	Q	phosphatic		
PCR	Q	picro		
POIK	Q	poikilitic		
PLY	Q	polymict		
P	Q	poorly sorted		
PORS	Q	porous		
POR	Q	porphyritic		
POT	Q	potassic		
PSC	Q	psammitic		
PBX	Q	pseudobrecciated		
PYR	Q	pyritic		
PYC	Q	pyroclastic		
QF	Q	quartzo-feldspathic		
RDL	Q	radiolarian		
RL	Q	rhythmic-layered		
RICH	Q	rich		
SA	Q	sandy		
SE	Q	sericitic		
SH	Q	sheared		
SILI	Q	siliceous		
SI	Q	silicified		
SLY	Q	silty		
SDC	Q	sodic		
STRO	Q	stromatilitic		
SUL	Q	sulphidic		
TPI	Q	tephri		
THL	Q	tholeiitic		
TCY	Q	trachy		
TFC	Q	tuffaceous		
UB	Q	ultrabasic		

LITHID	QUALIFIER	LITHNAME	PARENT	ROCKTYPE
UM	Q	ultramafic		
UNW	Q	unwelded		
VND	Q	veined		
VE	Q	vesicular		
VI	Q	vitric		
VOL	Q	volcanic		
VCC	Q	volcaniclastic		
WEA	Q	weathered		
WEL	Q	welded		
CLCR	R	calcrete		17
CLY	R	clay		17
DST	R	dust		17
FRCT	R	ferricrete		17
GSN	R	gossan		17
GVL	R	gravel		17
GRU	R	grus		17
LAG	R	lag		17
LATT	R	laterite		17
LOM	R	loam		17
LOS	R	loess		17
MUD	R	mud		17
SND	R	sand		17
SRLT	R	saprolite		17
SLCT	R	silcrete		17
SLT	R	silt		17
ARNT	S	arenite		10
AGLT	S	argillite		10
ARKS	S	arkose		10
BHRK	S	beachrock		10
BIOC	S	biocarbonate		
BIOM	S	biomicrite		11
BIOS	S	biosparite		11
BNBD	S	bone bed		11
BLD	S	boulder		10
BDST	S	boundstone		
CRNL	S	carnieule		11
CHLK	S	chalk		11
CHRT	S	chert		11
CLST	S	claystone		10
COAL	S	coal		
CNGL	S	conglomerate		
CQNA	S	coquina		11
DMCT	S	diamictite		10
DTMT	S	diatomite		10
DLST	S	dolostone		11
EVPT	S	evaporite		11
FGLT	S	fanglomerate		
FLNT	S	flint		11
GYST	S	geyserite		11
GNST	S	grainstone		11
GPST	S	grapestone		
GYWK	S	greywacke		
GUN	S	guano		11

LITHID	*QUALIFIER*	*LITHNAME*	*PARENT*	*ROCKTYPE*
GYT	S	gyttja		11
IRFM	S	iron formation		
IRST	S	ironstone		11
LMST	S	limestone		11
MARL	S	marl		10
MCRT	S	micrite		11
MDST	S	mudstone		10
NVLT	S	novaculite		10
OOZ	S	ooze		
PEAT	S	peat		
PELT	S	pelite		10
PHSP	S	phosphorite		
PSMT	S	psammite		10
PCLN	S	porcellanite		
RDLT	S	radiolarite		10
SDST	S	sandstone		10
SHLE	S	shale		10
SLST	S	siltstone		10
SPGT	S	sparagmite		
TLL	S	till		10
TLLT	S	tillite		10
TLLD	S	tilloid		10
TRVN	S	travertine		11
TBDT	S	turbidite		10

3.16 LITHUNITS AUTHORITY TABLE

This table is for lithological map unit symbols and definitions. It is primarily for identifying units in Archaean terranes where no formal stratigraphy has been defined. Map symbols are unique for each province; Note: Yilgarn is the only province with symbols in this table so far. The development of province-wide stratigraphy with matching geological units having the same symbol between sheets facilitates the easy integration of the data within a GIS.

MAPSYMBOL: An 8-character mandatory field for the characters which comprise the map symbol.

PROVNO: A mandatory number field of up to 5 digits for the geological province in which the unit occurs. Valid codes for geological provinces are derived from the GEOPROVS table.

UNITNAME: 128-character field for the name or description of the map unit.

3.17 LOCMETHODS AUTHORITY TABLE

This table is for the method by which the locality of a sample was determined.

Method No	*Method*
0	unknown
1	GPS observation (WGS-84 - World Geodetic System 1984)
2	GPS observation (AGD-66 - Australian Geodetic Datum 1966)
3	GPS observation (AGD-84 - Australian Geodetic Datum 1984)

Method No	*Method*
4	GPS observation (GDA-94 - Geocentric Datum of Australia 1994)
5	astronomical observation
6	surveyed from ground control
7	published report
8	unpublished report
10	non-standard topographic map
11	1:25 000 topographic map
12	1:50 000 topographic map
13	1:100 000 topographic map (AMG66)
14	1:250 000 topographic map
15	1:500 000 topographic map
16	1:1 000 000 topographic map
20	non-standard geological map
21	1:25 000 geological map
22	1:50 000 geological map
23	1:100 000 geological map (AMG66)
24	1:250 000 geological map
25	1:500 000 geological map
26	1:1 000 000 geological map
30	Differential GPS Survey quality (WGS84)

3.18 MEAN_METHOD AUTHORITY TABLE

This table lists the methods available for calculating the mean analysis values for each ion probe analysis. Each analysis on a zircon grain consists of seven measurements from which the mean is calculated.

Methodno	*Method*
1	Linear data fits (Claoue-Long, Maxwell)
2	Curved data fits (Ireland)
3	Combination - linear fits used to derive interelement ratios, curved fits used to derive intraelement ratios

3.19 METHODS TABLE

This table describes the analytical methods used in deriving the analyses. It will be noted that all the methods listed here are for geochemical analyses. It was intended to also use this table for listing analysis methods for OZCHRON, however up to this stage no methods for OZCHRON have been added. Therefore this table is not required for OZCHRON, however it was decided to include it for completeness.

METHODNO	*METHOD*
1	unknown
2	XRF (Norrish & Hutton, 1969); FeO Vol.; LOI Grav.
3	XRF (Norrish & Hutton, 1969); FeO Vol.; H2O+, H2O-, & CO2 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

METHODNO	METHOD
6	XRF (Norrish & Hutton, 1969); FeO, H2O(total), CO2 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 INA; U delayed neutron count
12	XRF (Norrish & Chappell, 1977).
13	XRF (Norrish & Chappell, 1977); Co Cu Ni Pb Zn by emiss. spectrm
14	ICP,AES Inductively Coupled Plasma, Atomic Emission Spectroscopy
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, Pb collection, ICP-MS finish (30g samp)
30	Direct-reading optical spectrograph (DROS), BMR.
31	XRF (Norrish & Hutton, 1969), LOI Grav. by University of WA
32	GSWA Government Chemical Laboratories.
33	Isotope dilution mass spectrometry, Sun & Nesbitt (1978)
34	XRF Nesbitt & Stanley (1980); traces
35	XRF (Nesbitt, et al, 1976); traces, by pressed powders
36	XRF (N&H, 1969, N&C 1977) at ANU; FeO, H2O+, H2O-, CO2 grav LaTb
37	Wet chemistry by University of WA (O'Beirne, 1968)
38	XRF (Mo,Sr,Rb,Pb,As,Zn,Cu,Ni,Cr), AAS (Li) (UWA: O'Beirne, 1968)
39	XRF (Norrish & Chappell, 1967); REE, Sc by ICP-AES (GSWA)
40	XRF (Norrish & Hutton, 1969); Na2O, K2O by AAS or ICP-AES (GSWA)
41	XRF+AAS/ICP-AES(GSWA); REE,Th,U,Ta,Hf,Rb,Cs,Sc,Co,Cr(INAA:OpenU)
42	XRF+ICP-AES; Au:fire assay; Pb:AAS; W:colourimetry (GSWA)
43	As 2, but crushed in steel so Fe (total) ~0.2-0.9% high
44	XRF (Norrish & Hutton, 1969) at ANU
45	ICP-MS at ANU; V by XRF (Norrish & Chappell, 1977)
46	XRF (Norrish & Chappell, 1977) at AGSO; ICP-MS at ANU
47	XRF (Norrish & Chappell, 1977) at AGSO; spark source MS at ANU
48	XRF (Norrish & Chappell, 1977) at AGSO; REE: isotope dil at ANU
49	XRF (Haukka & Thomas, 1977); H2O, CO2, LOI gravimet. at U. Melb.
50	XRF on powder pellets (Sc on glass discs); REE by RNAA: U. Melb.

3.20 ORIGINATORS AUTHORITY TABLE

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

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.J.
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.

ORIGNO	ORIGINATOR
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	MESA: Mines Energy SA
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.

ORIGNO	ORIGINATOR
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	Pearson, 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.
130	Grew, E.S.
131	Shibata, K.
132	Barton, J.M.
133	Sandiford, M.
134	Edgoose, C.
135	O'Beirne, W.
136	Wakelin-King, G.
137	Cassidy, K.F.
138	Ogasawara, M.
139	Fletcher, I.R.
140	Perring, C.S.
142	Compston, D.M.
144	Maas, R.
145	CSIRO-Yilgarn data
146	Netherway, N.M.
147	Price, R.
149	Giles, C.W.
150	Tyler, I.M.
151	Griffin, T.J.
152	Ojala, J.
153	Taylor, W.R.
154	Connors, K.A.
155	Hancock, S.L.
156	Pieters, P.E.
157	Creaser, R.A.
158	Whalen, J.B.
159	Hamlyn, P.R.
160	Hine, R.

ORIGNO	ORIGINATOR
161	Mason, D.R.
162	Kjolle, I.
163	Lanyon, R.
164	Trail, D.S.
165	Johnson, J.P.
166	Knight, J.
167	Gunther, M.
168	Rienks, I.P.
170	Champion, D.
171	Zhao, J.-X.
172	Raymond, O.L.
173	Schiotte, L.
174	Bennett, V.C.
175	NPD (Nat Petrol Dbase)
176	Wilford, J.
177	Kamprad, J.
179	Ryburn, R.J.
180	GSQ (Geol Surv of Qld)
181	Chan, R.A.
182	Craig, M.A.
183	Churchward, M.
184	Dohrenwend, J.C.
185	Gozzard, R.
186	Grimes, K.
187	Hazell, M.
188	Ollier, C.D.
189	Pain, C.F.
190	Gibson, D.L.
191	Fleming, C.
192	Peljo, M.
193	Shaw, S.E.
194	Wall, V.J.
195	Krassay, A.
196	Campbell, I.D.
197	Clarke, G.
198	Witt, W.K.
199	Pollard, P.
200	Cranfield, L.
201	Donchak, P.
202	Halfpenny, R.
203	Goldrick, G.
204	Harris, D.
206	Henry, R.
207	Jackson, M.J.
208	Logan, R.G.
209	MINDEP
210	MINOCC
211	MINLOC
212	Rees, I.
213	von Gnielinski, F.
214	MLU Geochem Survey Gp
218	Whitaker, A.J.
219	Szychowska, L.

ORIGNO	ORIGINATOR
220	Madigan, T.
221	Pietsch, B.
222	Haines, P.
223	Rawlings, D.
224	Bajwah, Z.
225	McPhie, J.
226	Camacho, A.
227	Krcmarov, R.
228	Brown, M.C.
229	Jung, P.
230	Bastrakov, E.N.
231	Radke, B.
232	McKee, C.
233	Harley, S.L.
234	Geol. Survey of N.S.W.
235	Cooke, D.
236	McGoldrick, P.
237	Abell, R.S.
238	Worrell, L.
239	Idnurm, M.
240	Hinman, M.C.
241	Lyons, P.
242	Thost, D.E.
243	Goleby, B.R.
244	Cox, S.F.
245	Brakel, A.
246	Sun, S.
247	Tingey, R.J.
248	Wang, Q.
249	Clark, W.
250	Pope, J.
251	Gregory, I.
252	Skirrow, R.G.
253	McMahon, T.P.
254	Streit, J.E.
255	Stewart, K.P.
256	Liu, S
257	Audetat, A.
258	Bodorkos, S.
259	Morrison, R.S.
260	Brauhart, C.

ORIGNO	ORIGINATOR
261	Carson, L.
262	Gibson, G.
263	Maidment, D.
264	Haren, R.
265	Adamides, N.G.
266	Apak, S.N.
267	Backhouse, J.
268	Bandy, S.J.
269	Carlsen, G.M.
270	Chakraborty, K.K
271	Copp, I.A.
272	Chen, C.F.
273	Crostella, A.
274	Farrell, T.R.
275	Ferguson, K.M.
276	Ghori, K.A.R.
277	Grey, K.
278	Havord, P.J.
279	Hickman, A.A.
280	Hocking, R.M.
281	Iasky, R.P.
282	Kojan, C.J.
283	Langford, R.L.
284	Morris, P.A.
285	Mory, A.J.
286	Meyers, J.S.
287	Nelson, D.R.
288	Occhipinti, S.A.
289	Perincek, D.
290	Pirajno, F.
291	Rogerson, R.J.
292	Ruddock, I.
293	Scillieri, R.C.
294	Sheppard, S.
295	Shevchenko, S.I.
296	Smithies, R.H.
297	Stevens, M.K.
298	Svalbe, A.K.
299	Swager, C.P.
300	Thorne, A.M.
301	Westaway, J.M.
302	Williams, I.R.
303	Huston, D.L.

3.20 THE PROVRANKS AUTHORITY TABLE

This table is for indicating the rank of geological provinces in the GEOPROVS table. Valid terms are listed below:

Rankno	*Rankname*
1	Province
2	Sub-province
3	Domain
4	Sub-domain
0	Super-province

3.21 QMAPS AUTHORITY TABLE

The QMAPS table is an authority table for 1:250 000 Map sheet areas.

Description of columns

MAPNO: A mandatory field of up to 6 characters identifying the 1:250 000 map sheet e.g., 'SF5412', 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.

MAPNAME: A mandatory field of up to 22 upper case characters for the name of the 1:250 000 map sheet identified by the 1:250 000 Map Number.

N_LAT: The latitude of the northwest corner of the 1:250 000 map sheet in degrees and decimal degrees.

W_LONG: The longitude of the northwest corner of the 1:250 000 map sheet in decimal degrees.

3.22 ROCKTYPES AUTHORITY TABLE

This table provides a basic subdivision of samples based on rocktypes. It is intended primarily for database management and block retrieval.

Number	*Rock Type*
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
17	regolith

3.23 SECTYPES AUTHORITY TABLE

This table is a lists types of drill holes or sections described in the SECTHOLES table.

Code	*Section Type*
P	Petroleum Well
W	Water Bore
M	Mineral Drill Hole
S	Surface Measured Section
C	Costean or Trench
A	Mine Adit or Shaft
E	Engineering Drill Hole
G	Geological Drill Hole
Z	Seismic Drill Hole

3.25 STRATLEX AUTHORITY VIEW

STRATLEX is a view of the Australian Register of Stratigraphic Names. It contains the names of approximately 15 000 stratigraphic units which are in current usage. It is derived from the GEODX database of stratigraphic names, administered by Stratigraphic Index staff of AGSO. Additional information for each unit covering such things as age, parent units, and overlying and underlying units is continually being added. Information on stratigraphic names can now be viewed online through the AGSO home page on the world wide web. Information provided includes currency, superseded names, if the name has been replaced by another and defining references.

The web address for the AGSO home page is: **http://www.agso.gov.au/**

Description of columns

UNITNO: A unique system-supplied integer of up to 5 digits.

UNITNAME: Mandatory field of 50 characters for the name of the stratigraphic unit, including any rank term that may be part of the name, e.g., 'Soldiers Cap Group' (where 'Group' is the rank term). Where a unit occurs in more than one state, the abbreviation of the state appears in brackets after the name of the stratigraphic unit.

RANK: A single-digit field to indicate stratigraphic rank. Valid ranks are derived from the STRATRANKS authority table listed below:

Rankno	*Rankname*
1	Supergroup
2	Group
3	Subgroup
4	Formation, beds
5	Member
6	Bed
7	unknown

STATUS: A mandatory 2-digit field for the status of the unit. Valid status codes are derived from the STRATSTATUS authority table listed below:

Statusno	*Statusname*
1	defined
2	redefined
3	fully described
4	described
5	briefly described
6	mentioned
7	informal
8	deleted

AGE1: An integer of up to 4 digits pointing to the older age limit of the stratigraphic unit. This integer corresponds to a term from the GEOTIME authority Table. Where no younger age limit is given, 'age1' is taken to be a general age for the unit as a whole.

AGE2: As for the 'Age1' pointer, but referring to a younger age limit for the unit, if known.

GEOLPROV: An integer of up to 5 digits pointing to the geological province in the GEOPROVS table.

COMMENTS: A field of 255 characters for comments on the unit, particularly those on any synonym and the history of definition and nomenclature. Any conflicts with other stratigraphic names in STRATLEX can also be noted.

Type Area Data:

TYPESTATE: A three-capital character field for the State in which the type area lies.

PARENT: An integer of up to 5 digits. The unit number of the parent stratigraphic unit, i.e., the related unit that is higher in rank. For example, the parent unit for a Member would always be a Formation, while the parent unit for a Formation could be a Group or a Subgroup.

OVERLYING: An integer of up to 5 digits. The Unit Number of the stratigraphically overlying unit.

OVEREL: Integer fields indicating boundary relationships to the overlying units. Valid numbers and terms are stored in the STRATRELS authority table.

UNDERLYING: An integer of up to 5 digits. The unit number of the stratigraphically underlying unit.

UNDEREL: Integer field indicating boundary relationships to the underlying units. Valid numbers and terms are stored in the STRATRELS authority table.

DEFREF: A 9-character field pointing to the reference publication in GEODX which defines the unit.

ENTRYDATE: The date the record was entered - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

LASTUPDATE: The date the record was last updated - in the standard ORACLE date format of DD-MMM-YY - e.g. '23-JUL-92'.

SECTHOLENO: A 6-digit integer identifying a stratigraphic section or type section which defines the unit from the SECTHOLES table. Currently no type section

has been defined in the SECTHOLES table, but in the future we are hoping make to these data available for newly defined units.

MAXTHICKNESS: A 7-digit number with up to 2 digits allowed after the decimal point for the maximum thickness of the unit.

ISCURRENT: A single-character field for a 'Y' or 'N' to indicate whether the unit is current. Within the STRATLEX view this field will always be 'Y'. Due to the continual updating taking place on the Australian Register of Stratigraphic Names the currency of some names may change from time to time. This could result in a stratno in the ROCKS table having no matching stratigraphic unit description in the STRATLEX view that we have sent you. If you have any records from the ROCKS table with no matching unit description in STRATLEX please contact us and we can then provide you with the current name of the unit.

3.26 THE STRATRELS AUTHORITY TABLE

The STRATRELS authority table is for indicating stratigraphic relationships to overlying and underlying stratigraphic units. Valid numbers and terms are:

Number	*Name*
1	unknown
2	not exposed
3	conformity
4	unconformity
5	disconformity
6	nonconformity
7	paraconformity
8	diastem

3.27 THE STRUCTYPES AUTHORITY TABLE

The STRUCTYPES authority table is the list of valid structural types and codes for the STRUCTURES table.

TYPE	*TYPEDESC*	*SUBTYPE*	*LEGEND*
0	Vector	0	drill hole/measured section vector
1	Bedding	1	Bedding (gen. dipping)
1		2	Bedding (gen. vertical)
1		3	Bedding gen. horizontal
1		4	Bedding gen. overturned
1		11	Bedding(facing definite)
1		12	Bedding vertical
1		13	Bedding horizontal
1		14	Bedding overturned
1		15	Bedding horizontal invert
1		21	Bedding (facing unknown)
1		22	Bedding unknown vertical
1		23	Bedding unknown horizontal
2	Cleavage	1	Cleavage dipping
2		2	Cleavage vertical
2		3	Cleavage horizontal
2		11	Crenulation cleavage

TYPE	TYPEDESC	SUBTYPE	LEGEND
2		12	Crenulation cleavage vert
2		13	Crenulation cleavage hori
3	Foliation	1	Foliation dipping
3		2	Foliation vertical
3		3	Foliation horizontal
4	Igneous Layering	1	Igneous layering dipping
4		2	Igneous layering vertical
4		3	Igneous layering horizont
5	Axial Surface	1	Axial surface dipping
5		2	Axial surface vertical
5		3	Axial surface horizontal
6	Fault Plane	1	Fault dipping
6		2	Fault vertical
6		3	Fault horizontal
7	Vein	1	Vein quartz
7		2	Vein porphyry
7		3	Vein dolerite
7		4	Vein granite
7		5	Vein lamprophyre
7		6	Vein pegmatite
7		7	Vein rodingite
7		8	Vein aplite
7		9	Vein microgranite
7		10	Vein syenite
8	Joint	1	Joint dipping
8		2	Joint vertical
8		3	Joint horizontal
20	Fold	1	Fold hinge
21		1	Mineral elongation
21	Lineation	2	Stretching lineation
21		3	Intersection lineation
21		4	Crenulation lineation
21		5	Slickenside
21		6	Mullion
22	Palaeocurrent	1	Palaeocurrent
23	Boudin axis	1	Boudin axis
31	Kink band	1	Kink band
32	Shearing	1	Shearing direction
35	Mylonite fabric	1	C plane
35		2	S plane

3.28 VEGTYPES AUTHORITY TABLE

This table is the AGSO vegetation types authority table (VEGET) and is based on AUSLIG's vegetation map of Australia.

VEGID	VEGDESC
F1	Sparse open herbfield
G1	Sparse open tussock grassland
G2	Open tussock grassland
G3	Tussock grassland or sedgeland
G4	Closed tussock grassland or sedgeland
H2	Hummock grassland
L1	Low open woodland with no significant lower stratum
L1F	Low open woodland with other herbaceous plants
L1G	Low open woodland with tussock grasses
L1H	Low open woodland with hummock grasses
L1S	Low open woodland with tall shrubs

VEGID	*VEGDESC*
L1Z	Low open woodland with low shrubs
L2	Low woodland with no significant lower stratum
L2G	Low woodland with tussock grasses
L2H	Low woodland with hummock grasses
L2S	Low woodland with tall shrubs
L2Z	Low woodland with low shrubs
L3	Low open forest with no significant lower stratum
L3G	Low open forest with tussock grasses
L3S	Low open forest with tall shrubs
L3Z	Low open forest with low shrubs
L4	Low closed forest
M1G	Open woodland with tussock grasses
M1H	Open woodland with hummock grasses
M1L	Open woodland with low trees
M1S	Open woodland with tall shrubs
M2G	Woodland with tussock grasses
M2H	Woodland with hummock grasses
M2L	Woodland with low trees
M2S	Woodland with tall shrubs
M2Z	Woodland with low shrubs
M3	Open forest with no significant lower stratum
M3G	Open forest with tussock grasses and graminoids
M3L	Open forest with low trees
M3S	Open forest with tall shrubs
M3Z	Open forest with low shrubs
M4	Closed forest
MIX	Mix of several categories
NIL	No significant vegetation
S1G	Tall open shrubland with tussock grasses
S1H	Tall open shrubland with hummock grasses
S1Z	Tall open shrubland with low shrubs
S2F	Tall shrubland with other herbaceous plants
S2G	Tall shrubland with tussock grasses
S2H	Tall shrubland with hummock grasses
S2Z	Tall shrubland with low shrubs
S3G	Open scrub with tussock grasses or graminoids
S3H	Open scrub with hummock grasses
S3Z	Open scrub with low shrubs
T3L	Tall open forest with low trees
T3M	Tall open forest with medium trees
T3S	Tall open forest with tall shrubs
T4	Tall closed forest
Z1	Low open shrubland with no significant lower stratum
Z1F	Low open shrubland with other herbaceous plants
Z1G	Low open shrubland with tussock grasses
Z1H	Low open shrubland with hummock grasses
Z2	Low shrubland with no significant lower stratum
Z2F	Low shrubland with other herbaceous plants
Z2G	Low shrubland with tussock grasses and graminoids
Z3	Open heath
Z3G	Open heath with tussock grasses
Z4	Closed heath

Section 4—Data Dictionary

The tables in this section are listed in the order that they need to be created if all foreign key constraints are to be implemented successfully.

4.1 ORIGINATORS authority table data dictionary

Note: ORIGINATORS is the AGSO authority table for originators.

```
CREATE TABLE ORIGINATORS (
      ORIGNO      NUMBER      (5,0)      NOT NULL,
      ORIGINATOR  VARCHAR2    (22)       NOT NULL );

ALTER TABLE SHRIMP_AGES ADD CONSTRAINT PK_ORIGINATORS PRIMARY KEY (ORIGNO);
```

4.2 AGSOCOUNTRIES authority table data dictionary

Note: AGSOCOUNTRIES is the AGSO authority table for countries.

```
CREATE TABLE AGSOCOUNTRIES (
      COUNTRYID   VARCHAR2    (3)    NOT NULL,
      COUNTRYNAME VARCHAR2    (32)   NOT NULL  );

ALTER TABLE AGSOCOUNTRIES ADD CONSTRAINT PK_AGSOCOUNTRIES
       PRIMARY KEY (COUNTRYID);
```

4.3 AGSOSTATES authority table data dictionary

Note: AGSOSTATES is the AGSO authority table for Australian states.

```
CREATE TABLE AGSOSTATES (
      STATEID     VARCHAR2    (3)    NOT NULL  PRIMARY KEY,
      STATENAME   VARCHAR2    (32)   NOT NULL  );

ALTER TABLE AGSOSTATES ADD CONSTRAINT PK_AGSOSTATES
       FOREIGN KEY (STATEID);
```

4.4 QMAPS authority table data dictionary

Note: QMAPS is the AGSO authority table for 1:250 000 map sheet areas.

```
CREATE TABLE QMAPS (
      MAPNO       VARCHAR2    (6),
      MAPNAME     VARCHAR2    (22),
      N_LAT       NUMBER      (3,1),
      W_LONG      NUMBER      (4,1) );

ALTER TABLE QMAPS ADD CONSTRAINT PK_QMAPS PRIMARY KEY (MAPNO);

CREATE              INDEX QMAPNAMES     ON QMAPS ( MAPNAME);
```

4.5 HMAPS authority table data dictionary

Note: HMAPS is the AGSO authority table for 1:100 000 map sheet areas.

```
CREATE TABLE HMAPS (
      HMAPNO      NUMBER      (4)  NOT NULL,
      MMAPID      VARCHAR2    (4),
      QMAPNO      NUMBER      (2),
      HMAPNAME    VARCHAR2    (22),
      N_LAT       NUMBER      (3,1),
      W_LONG      NUMBER      (4,1),
      MEAST       NUMBER      (6),
```

```
      MNORTH      NUMBER          (7),
      STATE1      VARCHAR         (3),
      STATE2      VARCHAR         (3)  );

ALTER TABLE HMAPS ADD CONSTRAINT PK_HMAPS PRIMARY KEY (HMAPNO);

CREATE              INDEX HMAPNAMES     ON HMAPS ( HMAPNAME );
```

4.6 LOCMETHODS authority table data dictionary

Note: LOCMETHODS is the AGSO authority table for location methods.

```
CREATE TABLE LOCMETHODS (
      LOCMETHNO   NUMBER          (3)    NOT NULL,
      LOCMETHOD   VARCHAR2        (64)   NOT NULL,
      ACCURACY    NUMBER          (4)  );

ALTER TABLE LOCMTHODS ADD CONSTRAINT PK_LOCMETHODS (LOCMETHNO);
```

4.7 GEOREGIONS authority table data dictionary

Note: GEOREGIONS is the AGSO authority table of geographical region names.

```
CREATE TABLE GEOREGIONS (
      REGNO               NUMBER    (3)    NOT NULL,
      PROVNO              NUMBER    (3)    NOT NULL,
      REGNAME             VARCHAR2  (64)   NOT NULL,
      REGLETS             VARCHAR2  (4)    NOT NULL,
      COUNTRYID           VARCHAR2  (3)    NOT NULL,
      COMMENTS            VARCHAR2  (64),
      ENTRYDATE           DATE             NOT NULL,
      ENTEREDBY           VARCHAR2  (8)    NOT NULL );

ALTER TABLE GEOREGIONS ADD CONSTRAINT PRIMARY KEY (REGNO);
```

4.8 AGSOAUTHS table data dictionary

Note: the AGSOAUTHS table is for the authors of references recorded in the AGSOREFS table.

```
CREATE TABLE AGSOAUTHS (
      REFID               VARCHAR2 (9)        NOT NULL,
      AUTHOR              VARCHAR2 (60)       NOT NULL,
      SEQUENCE            NUMBER   (3)        NOT NULL,
      ENTEREDBY           VARCHAR2 (8)        NOT NULL);

ALTER TABLE AGSOAUTHS ADD CONSTRAINT PK_AGSOAUTHS PRIMARY KEY (REFID);

CREATE       INDEX AUTHAUTHORS ON AGSOAUTHS ( AUTHOR);
```

4.9 AGSOREFS table data dictionary

Note: the AGSOREFS table is for the title and source details of references in AGSO's Bibliographic References Database.

```
CREATE TABLE AGSOREFS (
      REFID               VARCHAR2 (9)        NOT NULL,
      OTHERID             VARCHAR2 (16),
      ENTEREDBY           VARCHAR2 (8),
      ENTRYDATE           DATE,
      YEAR                VARCHAR2 (40),
      TITLE               VARCHAR2 (1024),
      SOURCE              VARCHAR2 (1024)     NOT NULL,
      VOLPART             VARCHAR2 (36),
      PAGES               VARCHAR2 (36) );
```

```
ALTER TABLE AGSOREFS ADD CONSTRAINT PK_AGSOREFS PRIMARY KEY (REFID);

CREATE              INDEX REFOTHER      ON AGSOREFS (OTHERID);
```

4.10 SITES table data dictionary

Note: the SITES table is for location data for each sample site.

```
CREATE TABLE SITES (
      ORIGNO        NUMBER        (5)    NOT NULL,
      SITEID        VARCHAR2      (16)   NOT NULL,
      FIELDID       VARCHAR2      (16),
      OBSDATE       DATE,
      OBSTIME       NUMBER        (4,2),
      COUNTRYID     VARCHAR2      (3)    NOT NULL,
      STATE         VARCHAR2      (3),
      GEOGAREA      VARCHAR2      (64),
      LOCDESC       VARCHAR2      (64),
      HMAPNO        NUMBER        (4),
      QMAPID        VARCHAR2      (6),
      EASTING       NUMBER        (8,2),
      NORTHING      NUMBER        (9,2),
      ACCURACY      NUMBER        (5)    NOT NULL,
      HEIGHT        NUMBER        (5),
      HEIGHTACC     NUMBER        (3),
      DLAT          NUMBER        (8,6),
      NS            VARCHAR2      (1),
      DLONG         NUMBER        (9,6),
      EW            VARCHAR2      (1),
      METHOD        NUMBER        (3)    NOT NULL,
      BIBREF        VARCHAR2      (9),
      AIRPHOTO      VARCHAR2      (36),
      OC            VARCHAR2      (1),              REM OUTCROP TABLE
      ST            VARCHAR2      (1),              REM STRUCTURE TABLE
      RO            VARCHAR2      (1),              REM ROCKS TABLE
      PE            VARCHAR2      (1),              REM PETROGRAPHY DATABASE
      RC            VARCHAR2      (1),              REM ROCKCHEM DATABASE
      OZ            VARCHAR2      (1),              REM OZCHRON DATABASE
      SC            VARCHAR2      (1),              REM STREAMCHEM DATABASE
      RT            VARCHAR2      (1),              REM REGOLITH DATABASE
      RP            VARCHAR2      (1),              REM ROCKPROPS DATABASE
      SP            VARCHAR2      (1),              REM SPECPROPS DATABASE
      SH            VARCHAR2      (1),              REM DRILLHOLE DATABASE
      RS            VARCHAR2      (1)               REM ROCK STORE DATABASE
      ENTRYDATE     DATE                NOT NULL,
      ENTEREDBY     VARCHAR2      (8)   NOT NULL,
      LASTUPDATE    DATE,
      REGNO         NUMBER        (5));

ALTER TABLE SITES ADD CONSTRAINT PK_SITES
      PRIMARY KEY (ORIGNO,SITEID);

ALTER TABLE SITES ADD CONSTRAINT PK_SITES_ORIGNO
      FOREIGN KEY (ORIGNO) REFERENCES ORIGINATORS (ORIGNO);

ALTER TABLE SITES ADD CONSTRAINT PK_SITES_COUNTRYID
      FOREIGN KEY (COUNTRYID) REFERENCES AGSOCOUNTRIES (COUNTRYID);

ALTER TABLE SITES ADD CONSTRAINT PK_SITES_STATE
      FOREIGN KEY (STATE) REFERENCES AGSOSTATES (STATEID);

ALTER TABLE SITES ADD CONSTRAINT PK_SITES_HMAPS
      FOREIGN KEY (HMAPNO) REFERENCES HMAPS (HMAPNO);

ALTER TABLE SITES ADD CONSTRAINT PK_SITES_QMAPS
      FOREIGN KEY (QMAPID) REFERENCES QMAPS (MAPNO);

ALTER TABLE SITES ADD CONSTRAINT PK_SITES_METHOD
      FOREIGN KEY (METHOD) REFERENCES LOCMETHODS (LOCMETHODNO);

ALTER TABLE SITES ADD CONSTRAINT PK_SITES_BIBREF
      FOREIGN KEY (BIBREF) REFERENCES AGSOREFS (REFID);
```

```
ALTER TABLE SITES ADD CONSTRAINT PK_SITES_REGNO
      FOREIGN KEY (REGNO) REFERENCES GEOREGIONS (REGNO);

CREATE              INDEX SITEIDS       ON SITES ( SITEID );
CREATE              INDEX SITEREGNOS    ON SITES ( REGNO );
CREATE              INDEX SITEHMAPS     ON SITES ( HMAPNO );
CREATE              INDEX SITEQMAPS     ON SITES ( QMAPID );
CREATE              INDEX SITEDLATS     ON SITES ( DLAT );
CREATE              INDEX SITEDLONGS    ON SITES ( DLONG );
CREATE              INDEX SITESST       ON SITES ( ST );
CREATE              INDEX SITESRT       ON SITES ( RT );
```

4.11 LANDF authority table data dictionary

Note: LANDF is the AGSO authority table which describes landform classes.

```
CREATE TABLE LANDF (
      L_CODE       VARCHAR2       (4)    NOT NULL,
      L_DESC       VARCHAR2       (30)   NOT NULL );

ALTER TABLE LANDF ADD CONSTRAINT PK_LANDF (L_CODE);
```

4.12 VEGET authority table data dictionary

Note: VEGET is the AGSO authority table which describes vegetation classes.

```
CREATE TABLE VEGET (
      VEGID        VARCHAR2       (5)    NOT NULL,
      VEGDESC      VARCHAR2       (60)   NOT NULL );

ALTER TABLE VEGET ADD CONSTRAINT PK_VEGET (VEGID);
```

4.13 OUTCROPS table data dictionary

Note: the OUTCROPS table is for outcrop-scale data.

```
CREATE TABLE OUTCROPS (
      ORIGNO       NUMBER      (5,0)    NOT NULL,
      SITEID       VARCHAR2    (16)     NOT NULL,
      ROCKRELS     VARCHAR2    (128),
      SKETCH       VARCHAR2    (64),
      PHOTO        VARCHAR2    (64),
      VEGCODE      VARCHAR2    (5),
      VEGETATION   VARCHAR2    (64),
      LANDCODE     VARCHAR2    (4),
      LANDFORM     VARCHAR2    (64),
      LASTUPDATE   DATE,
      ENTRYDATE    DATE                 NOT NULL,
      ENTEREDBY    VARCHAR2    (8)      NOT NULL);

ALTER TABLE OUTCROPS ADD CONSTRAINT PK_OUTCROPS
      PRIMARY KEY (ORIGNO,SITEID);

ALTER TABLE OUTCROPS ADD CONSTRAINT FK_OUTCROPS
      FOREIGN KEY (ORIGNO,SITEID) REFERENCES SITES (ORIGNO, SITEID);

ALTER TABLE OUTCROPS ADD CONSTRAINT PK_OUTCROPS_ORIGNO
      FOREIGN KEY (ORIGNO) REFERENCES ORIGINATORS (ORIGNO);

ALTER TABLE OUTCROPS ADD CONSTRAINT PK_OUTCROPS_VEGCODE
      FOREIGN KEY (VEGCODE) REFERENCES VEGET (VEGID);

ALTER TABLE OUTCROPS ADD CONSTRAINT PK_OUTCROPS_LANDCODE
      FOREIGN KEY (LANDCODE) REFERENCES LANDF (L_CODE);

CREATE        INDEX OCSITEIDS     ON OUTCROPS ( SITEID );
```

4.14 TIMERANK authority table data dictionary

Note: TIMERANK is AGSO's authority table of geological time ranks for the GEOTIMES table.

```
CREATE TABLE TIMERANK (
      RANKNO            NUMBER    (1)  NOT NULL,
      RANKNAME          VARCHAR2  (16) NOT NULL );

ALTER TABLE TIMERANK ADD CONSTRAINT PK_TIMERANK PRIMARY KEY (RANKNO);
```

4.15 TIMESCOPE authority table data dictionary

Note: TIMESCOPE is the AGSO authority table for the geographic scope of the geological time terms in the GEOTIMES table.

```
CREATE TABLE TIMESCOPE (
      SCOPENO           NUMBER    (1)  NOT NULL,
      SCOPENAME         VARCHAR2( 20)  NOT NULL );

ALTER TABLE TIMESCOPE ADD CONSTRAINT PK_TIMESCOPE PRIMARY KEY (SCOPENO);
```

4.16 TIMESTATUS authority table data dictionary

Note: TIMESTATUS is the AGSO authority table for the status of the geological time terms in the GEOTIMES table.

```
CREATE TABLE TIMESTATUS (
      STATUSNO          NUMBER    (1)  NOT NULL,
      STATUSNAME        VARCHAR2  (20) NOT NULL );

ALTER TABLE TIMESTATUS ADD CONSTRAINT PK_STATUSNO PRIMARY KEY (STATUSNO);
```

4.17 GEOTIME authority table data dictionary

Note: GEOTIME is the AGSO authority table on geological ages.

```
CREATE TABLE GEOTIME (
      AGENO       NUMBER          (4)    NOT NULL,
      AGENAME     VARCHAR2        (24)   NOT NULL,
      SCOPE       NUMBER          (2)    NOT NULL,
      RANK        VARCHAR2        (8)    NOT NULL,
      STATUS      VARCHAR2        (8)    NOT NULL,
      PARENT      NUMBER          (4),
      YNGBOUND    NUMBER          (8,3),
      OLDBOUND    NUMBER          (8,3),
      COMMENTS    VARCHAR2        (64),
      GEODXID     VARCHAR2        (5),
      LASTALT     DATE     );

ALTER TABLE GEOTIME ADD CONSTRAINT PK_GEOTIME PRIMARY KEY (AGENO);

ALTER TABLE GEOTIME ADD CONSTRAINT FK_GEOTIME_SCOPE
       FOREIGN KEY (SCOPE) REFERENCES TIMESCOPE (SCOPENO);

ALTER TABLE GEOTIME ADD CONSTRAINT FK_GEOTIME_RANK
       FOREIGN KEY (RANK) REFERENCES TIMERANK (RANKNO);

ALTER TABLE GEOTIME ADD CONSTRAINT FK_GEOTIME_STATUS
       FOREIGN KEY (STATUS) REFERENCES TIMESTATUS (STATUSNO);

ALTER TABLE GEOTIME ADD CONSTRAINT FK_GEOTIME_GEODXID
       FOREIGN KEY (GEODXID) REFERENCES AGSOREFS (REFID);
```

4.18 PROVRANKS authority table data dictionary

Note: PROVRANKS is the AGSO authority table for ranking provinces, subprovinces and domains in the GEOPROVS table.

```
CREATE TABLE PROVRANKS (
      RANKNO              NUMBER    (1)  NOT NULL,
      RANKNAME            VARCHAR2  (20) NOT NULL );

ALTER TABLE PROVRANKS ADD CONSTRAINT PK_PROVRANKS PRIMARY KEY (RANKNO);
```

4.19 GEOPROVS authority table data dictionary

Note: GEOPROVS is the AGSO authority table for geological provinces, subprovinces and domains.

```
CREATE TABLE GEOPROVS (
      PROVNO          NUMBER        (3)   NOT NULL,
      PROVNAME        VARCHAR2      (64)  NOT NULL,
      PROVLETS        VARCHAR2      (4),
      TYPE            VARCHAR2      (16),
      RANK            NUMBER        (1),
      STATUS          NUMBER        (1)  NOT NULL,
      PARENT          NUMBER        (3),
      GEODX_REF       VARCHAR2      (9),
      COMMENTS        VARCHAR2      (64),
      USERID          VARCHAR2      (16),
      LASTCHANGED     DATE,
      ELON            NUMBER        (5,2),
      WLON            NUMBER        (5,2),
      TLAT            NUMBER        (5,2),
      BLAT            NUMBER        (5,2)  );

ALTER TABLE GEOPROVS ADD CONSTRAINT PK_GEOPROVS PRIMARY KEY (PROVNO);

ALTER TABLE GEOPROVS ADD CONSTRAINT FK_GEOPROVS_RANK
      FOREIGN KEY (RANK) REFERENCES PROVRANKS (RANKNO);

ALTER TABLE GEOPROVS ADD CONSTRAINT FK_GEOPROVS_STATUS
      FOREIGN KEY (STATUS) REFERENCES STRATSTATUS (STATUSNO);

ALTER TABLE GEOPROVS ADD CONSTRAINT FK_GEOPROVS_GEODX_REF
      FOREIGN KEY (GEODX_REF) REFERENCES AGSOREFS (REFID);

CREATE              INDEX GEOPROVNAME ON GEOPROVS ( PROVNAME );
```

4.20 STRATRANK authority table data dictionary

Note: STRATRANK is the AGSO authority table of stratigraphic unit ranks in the STRATLEX view.

```
CREATE TABLE STRATRANKS (
      RANKNO              NUMBER    (1)  NOT NULL,
      RANKNAME            VARCHAR2  (16) NOT NULL );

ALTER TABLE STRATRANK ADD CONSTRAINT PK_STRATRANK PRIMARY KEY (RANKNO);
```

4.21 STRATSTATUS authority table data dictionary

Note: STRATSTATUS is the AGSO authority table of levels of status for the units in the STRATLEX view.

```
CREATE TABLE STRATSTATUS (
      STATUSNO            NUMBER    (1)  NOT NULL,
      GEODXID             VARCHAR2  (4),
      STATUSNAME          VARCHAR2  (20) NOT NULL );
```

```
ALTER TABLE STRATSTATUS ADD CONSTRAINT PK_STRATSTATUS PRIMARY KEY (STATUSNO);
```

4.22 STRATRELS authority table data dictionary

Note: STRATRELS is the AGSO authority table on stratigraphic relationships.

```
CREATE TABLE STRATRELS (
      RELNO       NUMBER        (1),
      RELNAME     VARCHAR2      (32) );

ALTER TABLE STRATRELS ADD CONSTRAINT PK_STRATRELS PRIMARY KEY (RELNO);
```

4.23 STRATLEX authority table data dictionary

Note: STRATLEX is AGSO's database of current Australian Stratigraphic Names.

```
CREATE TABLE STRATLEX (
      UNITNO        NUMBER        (5)    NOT NULL,
      UNITNAME      VARCHAR2      (64)   NOT NULL,
      RANK          NUMBER        (1),
      STATUS        NUMBER        (1),
      AGE1          NUMBER        (4),
      AGE2          NUMBER        (4),
      GEOLPROV      NUMBER        (3),
      COMMENTS      VARCHAR2      (240),
      TYPESTATE     VARCHAR2      (3),
      PARENT        NUMBER        (5),
      OVERLYING     NUMBER        (5),
      OVEREL        NUMBER        (2),
      UNDERLYING    NUMBER        (5),
      UNDEREL       NUMBER        (2,0),
      DEFREF        VARCHAR2      (8),
      SECTHOLENO    NUMBER        (6),
      MAXTHICKNESS  NUMBER        (7),
      ISCURRENT     VARCHAR2      (1)    NOT NULL,
      ENTRYID       VARCHAR2      (8)    NOT NULL,
      UPDATEID      VARCHAR2      (8),
      ENTRYDATE     DATE      ,
      LASTUPDATE    DATE                       );

ALTER TABLE STRATLEX ADD CONSTRAINT PK_STRATLEX PRIMARY KEY (UNITNO);

ALTER TABLE STRATLEX ADD CONSTRAINT UK_STRATLEX_STRATNAME UNIQUE (STRATNAME);

ALTER TABLE STRATLEX ADD CONSTRAINT FK_STRATLEX_RANK
       FOREIGN KEY (RANK) REFERENCES STRATRANK (RANKNO);

ALTER TABLE STRATLEX ADD CONSTRAINT FK_STRATLEX_STATUS
       FOREIGN KEY (STATUS) REFERENCES STRATSTATUS (STATUSNO);

ALTER TABLE STRATLEX ADD CONSTRAINT FK_STRATLEX_AGE1
       FOREIGN KEY (AGE1) REFERENCES GEOTIME (AGENO);

ALTER TABLE STRATLEX ADD CONSTRAINT FK_STRATLEX_AGE2
       FOREIGN KEY (AGE2) REFERENCES GEOTIME (AGENO);

ALTER TABLE STRATLEX ADD CONSTRAINT FK_STRATLEX_OVEREL
       FOREIGN KEY (OVEREL) REFERENCES STRATRELS (RELNO);

ALTER TABLE STRATLEX ADD CONSTRAINT FK_STRATLEX_UNDEREL
       FOREIGN KEY (UNDEREL) REFERENCES STRATRELS (RELNO);

ALTER TABLE STRATLEX ADD CONSTRAINT FK_STRATLEX_GEOLPROV
       FOREIGN KEY (GEOLPROV) REFERENCES GEOPROVS (PROVNO);

ALTER TABLE STRATLEX ADD CONSTRAINT FK_STRATLEX_TYPESTATE
       FOREIGN KEY (TYPESTATE) REFERENCES AGSOSTATES (STATEID);

ALTER TABLE STRATLEX ADD CONSTRAINT FK_STRATLEX_DEFREF
```

```
      FOREIGN KEY (DEFREF) REFERENCES AGSOREFS (REFID);

CREATE              INDEX STRATLEXNAMES ON STRATLEX ( UNITNAME );
```

4.24 ROCKTYPES authority table data dictionary

Note: ROCKTYPES is an AGSO authority table which is a broad classification of all rocks into 17 basic rock types.

```
CREATE TABLE ROCKTYPES (
      ROCKNO      NUMBER          (2)    NOT NULL,
      ROCKTYPE    VARCHAR2        (32)   NOT NULL );

ALTER TABLE ROCKTYPES ADD CONSTRAINT PK_ROCKNO PRIMARY KEY (ROCKNO);
```

4.25 LITHOLOGIES authority table data dictionary

Note: the LITHOLOGIES authority table contains the AGSO detailed lithological nomenclature table, including qualifiers.

```
CREATE TABLE LITHOLOGIES (
      LITHID      VARCHAR2        (4)  NOT NULL,
      QUALIFIER   VARCHAR2        (1)  NOT NULL,
      LITHNAME    VARCHAR2        (32) NOT NULL
      PARENT      VARCHAR2        (4),
      ROCKTYPE    NUMBER   (5)    );

ALTER TABLE LITHOLOGIES ADD CONSTRAINT PK_LITHOLOGIES (LITHID);

ALTER TABLE LITHOLOGIES ADD CONSTRAINT FK_LITHOLOGIES_ROCKTYPE
      FOREIGN KEY (ROCKTYPE) REFERENCES ROCKTYPES (ROCKNO);

CREATE UNIQUE       INDEX LNNAMES          ON LITHNAMES ( LITHNAME );
```

4.26 LITHUNITS authority table data dictionary

Note: LITHUNITS is the AGSO authority table for map unit symbols and definitions.

```
CREATE TABLE LITHUNITS (
      MAPSYMBOL     VARCHAR2      (8) NOT NULL,
      PROVNO        NUMBER        (5) NOT NULL,
      UNITNAME      VARCHAR2      (128)  );

ALTER TABLE LITHUNITS ADD CONSTRAINT PRIMARY KEY (MAPSYMBOL,PROVNO);
```

4.27 AGSOMINERALS authority table data dictionary

Note: AGSOMINERALS is the AGSO authority table of mineral names.

```
CREATE TABLE AGSOMINERALS (
      MINABBREV          VARCHAR2(4)  NOT NULL,
      MINNAME            VARCHAR2(32) NOT NULL,
      COMMON             VARCHAR2(1),
      ORE                VARCHAR2(1) );

ALTER TABLE AGSOMINERALS ADD CONSTRAINT PRIMARY KEY (MINABBREV);

ALTER TABLE AGSOMINERALS ADD CONSTRAINT UK_AGSOMINERALS_MINNAME
      UNIQUE (MINNAME);
```

4.28 LITHNAMES view data dictionary

Note: LITHNAMES is a view on the LITHOLOGIES and AGSOMINERALS tables.

```
CREATE VIEW LITHNAMES AS (
                        SELECT LITHNAME, QUALIFIER, LITHNAME
                             FROM NGMA.LITHOLOGIES
                   UNION
                        SELECT MINABBREV, Q, MINNAME
                             FROM NGMA.AGSOMINERALS
                                  WHERE COMMON = 'C');
```

4.29 ROCKS table data dictionary

Note: The ROCKS table is for data on stratigraphy and lithology for individual samples.

```
CREATE TABLE ROCKS (
      ROCKNO        NUMBER       (6)    NOT NULL,
      ORIGNO        NUMBER       (5)    NOT NULL,
      SITEID        VARCHAR2     (16)   NOT NULL,
      SAMPLEID      VARCHAR2     (16),
      ROCKTYPE      NUMBER       (2),
      QUALIFIER     VARCHAR2     (20),
      LITHNAME      VARCHAR2     (32),
      GROUPING      VARCHAR2     (50),
      STRATNO       NUMBER       (5),
      INFORMAL      VARCHAR2     (64),
      AGE           VARCHAR2     (54),
      DESCRIPTION   VARCHAR2     (64),
      OTHERINFO     VARCHAR2     (64),
      SECTHHOLENO   NUMBER       (5),
      GEOLPROVNO    NUMBER       (3),
      QUALIFIER2    VARCHAR2     (20),
      QUALIFIER3    VARCHAR2     (20),
      MAPSYMBOL     VARCHAR2     (8),
      MODEOCC       VARCHAR2     (4)),
      LASTUPDATE    DATE,
      ENTRYDATE     DATE                NOT NULL,
      ENTEREDBY     VARCHAR2     (8)    NOT NULL);

ALTER TABLE ROCKS ADD CONSTRAINT PK_ROCKS PRIMARY KEY (ROCKNO);

ALTER TABLE ROCKS ADD CONTSTRAINT FK_ROCKS_ORIGNO_SITEID
       FOREIGN KEY (ORIGNO, SITEID) REFERENCES SITES (ORIGNO,SITEID);

ALTER TABLE ROCKS ADD CONSTRAINT FK_ROCKS_ORIGNO
       FOREIGN KEY (ORIGNO) REFERENCES ORIGINATORS (ORIGNO);

ALTER TABLE ROCKS ADD CONSTRAINT FK_ROCKS_ROCKTYPE
       FOREIGN KEY (ROCKTYPE) REFERENCES ROCKTYPES (ROCKNO);

ALTER TABLE ROCKS ADD CONSTRAINT FK_ROCKS_STRATNO
       FOREIGN KEY (STRATNO) REFERENCES STRATLEX (UNITNO);

ALTER TABLE ROCKS ADD CONSTRAINT FK_ROCKS_GEOLPROVNO
       FOREIGN KEY (GEOLPROVNO) REFERENCES GEOPROVS (PROVNO);

ALTER TABLE ROCKS ADD CONSTRAINT FK_ROCKS_MAPSYMBOL
       FOREIGN KEY (MAPSYMBOL, GEOLPROVNO)
             REFERENCES LITHUNITS (MAPSYMBOL, PROVNO);

CREATE              INDEX ROCKORIGSITES ON ROCKS ( ORIGNO, SITEID );
CREATE              INDEX ROCKSITES     ON ROCKS ( SITEID );
CREATE              INDEX ROCKORIGSAMPS ON ROCKS ( ORIGNO, SAMPLEID );
```

4.30 LITHDATATYPES authority table data dictionary

Note: LITHDATATYPES is the AGSO authority table for extendable attributes for the LITHDATA table.

```
CREATE TABLE LITHDATATYPES (
      DATATYPE    VARCHAR2   (4)  NOT NULL,
      TYPEDESC    VARCHAR2   (32) NOT NULL,
      SUBTYPE     VARCHAR2   (4),
```

```
      SUBDESC      VARCHAR2    (32) );

ALTER TABLE LITHDATATYPES ADD CONSTRAINT PK_LITHDATATYPES
       PRIMARY KEY (DATATYPE, SUBTYPE);
```

4.31 ROCKDATATYPES view data dictionary

Note: ROCKDATATYPES is a view on the LITHDATATYPES and AGSOMINERALS tables.

```
CREATE VIEW ROCKDATATYPES AS (
                    SELECT DATATYPE, TYPEDESC, SUBTYPE, SUBDESC
                         FROM NGMA.LITHDATATYPES
                UNION
                    SELECT 'MI', 'Mineral', MINABBREV, MINNAME
                         FROM NGMA.AGSOMINERALS );
```

4.32 LITHDATA table data dictionary

Note: LITHDATA is the extendable lithological attributes table for the rocks table.

```
 CREATE TABLE LITHDATA (
       ROCKNO        NUMBER    (5,0)   NOT NULL,
       DATATYPE      VARCHAR2  (4)     NOT NULL,
       SUBTYPE       VARCHAR2  (4),
       DESCRIPTION   VARCHAR2  (64),
       LASTUPDATE    DATE,
       ENTEREDBY     VARCHAR2  (8)     NOT NULL,
       ENTRYDATE     DATE              NOT NULL  );

ALTER TABLE LITHDATA ADD CONSTRAINT PK_LITHDATA
       PRIMARY KEY (ROCKNO, DATATYPE, SUBTYPE, DESCRIPTION);

ALTER TABLE LITHDATA ADD CONSTRAINT FK_LITHDATA_ROCKNO
       FOREIGN KEY (ROCKNO) REFERENCES ROCKS (ROCKNO);

CREATE              INDEX  LDLITHNO      ON LITHDATA ( ROCKNO );
```

4.33 STRUCTYPES authority table data dictionary

Note: STRUCTYPES is the AGSO authority table of structural types used by the STRUCTURES table.

```
CREATE TABLE STRUCTYPES (
      TYPE                NUMBER    (3)   NOT NULL,
      SUBTYPE             NUMBER    (2)   NOT NULL,
      LEGEND              VARCHAR2  (35)  NOT NULL,
      ENDPT               NUMBER    (6,2),
      AGSOCODE            NUMBER    (4),
      TYPEDESC            VARCHAR2  (16) );

ALTER TABLE STRUCTYPES ADD CONSTRAINT PK_STRUCTYPE
       PRIMARY KEY (TYPE, SUBTYPE);
```

4.34 STRUCTURES table data dictionary

Note: STRUCTURES is the table for recording structural measurements for rock descriptions and survey data from the INTERIZONS table.

```
CREATE TABLE STRUCTURES (
      ORIGNO        NUMBER (5,0)   NOT NULL,
      SITEID        CHAR   (16)    NOT NULL,
      ROCKNO        NUMBER (6,0),
      TYPE          NUMBER (2,0)   NOT NULL,
      SUBTYPE       NUMBER (2,0),
      AZIMUTH       NUMBER (3,0),
```

```
      INCLINATION  NUMBER (2,0),
      DEFNO        NUMBER (1,0),
      DEFSURFNO    NUMBER (1,0),
      PLOTRANK     NUMBER (3,0),
      STRUCNO      NUMBER (7)     NOT NULL,
      ENTEREDBY    CHAR   (8)     NOT NULL,
      ENTRYDATE    DATE           NOT NULL );

ALTER TABLE STRUCTURES ADD CONSTRAINT FK_STRUCTURES_ORIGNO_SITEID
     FOREIGN KEY (ORIGNO, SITEID) REFERENCES SITES (ORIGNO, SITEID);

ALTER TABLE STRUCTURES ADD CONSTRAINT FK_STRUCTURES_ROCKNO
     FOREIGN KEY (ROCKNO) REFERENCES ROCKS (ROCKNO);

ALTER TABLE STRUCTURES ADD CONSTRAINT FK_STRUCTURES_ORIGNO
     FOREIGN KEY (ORIGNO) REFERENCES ORIGINATORS (ORIGNO);

CREATE INDEX STRUCTORIGSITES ON STRUCTURES ( ORIGNO, SITEID );
CREATE INDEX STRUCTSITEIDS   ON STRUCTURES ( SITEID );
CREATE INDEX STRUCTROCKNOS   ON STRUCTURES ( ROCKNO );
CREATE INDEX STRUCTUSERS     ON STRUCTURES ( ENTEREDBY );
```

4.35 SECTYPES authority table data dictionary

Note: SECTYPES is the AGSO authority table of measured section types for the SECTHOLES table.

```
CREATE TABLE SECTYPES (
      FLAG          VARCHAR2   (1)  NOT NULL,
      FLAGNAME      VARCHAR2   (24) NOT NULL);

ALTER TABLE SECTYPES ADD CONSTRAINT PK_SECTYPES PRIMARY KEY (FLAG);
```

4.36 SECTHOLES table data dictionary

Note: SECTHOLES is a table of header information for measured sections and drill holes.

```
CREATE TABLE (
      SECTHOLENO        NUMBER   (5)          NOT NULL,
      ORIGNO            NUMBER   (5)          NOT NULL,
      SITEID            VARCHAR2 (16)         NOT NULL,
      SECTYPE           VARCHAR2 (1),
      TYPESEC           VARCHAR2 (1)          NOT NULL,
      PEDIN_UNO         VARCHAR2 (8),
      DH_COMPANY        VARCHAR2 (48),
      DH_ID             VARCHAR2 (48),
      AV_AZIMUTH        NUMBER   (3),
      AV_INCLIN         NUMBER   (2),
      TOT_METRES        NUMBER   (6,2),
      BEDPERP           VARCHAR2 (1)          NOT NULL,
      REFID             VARCHAR2 (9),
      ENTRYDATE         DATE                  NOT NULL,
      UPORDOWN          VARCHAR2 (1)          NOT NULL );

ALTER TABLE SECTHOLES ADD CONSTRAINT PK_SECTHOLES PRIMARY KEY (SECTHOLENO);

ALTER TABLE SECTHOLES ADD CONSTRAINT FK_SECTHOLES_ORIGNO_SITEID)
       FOREIGN KEY (ORIGNO, SITEID) REFERENCES SITES (ORIGNO, SITEID);

ALTER TABLE SECTHOLES ADD CONSTRAINT FK_SECTHOLES_ORIGNO
       FOREIGN KEY (ORIGNO) REFERENCES ORIGINATORS (ORIGNO);

ALTER TABLE SECTHOLES ADD CONSTRAINT FK_SECTHOLES_SECTYPE
       FOREIGN KEY (SECTYPE) REFERENCES SECTYPES (FLAG);

ALTER TABLE SECTHOLES ADD CONSTRAINT CK_SECTHOLES_TYPESEC
       CHECK (TYPESEC IN ('O', 'R', 'T'));

ALTER TABLE SECTHOLES ADD CONSTRAINT CK_SECTHOLES_AZIMUTH
```

```
      CHECK (AV_AZIMUTH BETWEEN 0 AND 359);

ALTER TABLE SECTHOLES ADD CONSTRAINT CK_SECTHOLES_AV_INCLIN
      CHECK (AV_INCLIN BETWEEN -90 AND 90);

ALTER TABLE SECTHOLES ADD CONSTRAINT CK_SECTHOLES_BEDPERP
      CHECK (BEDPERP IN ('N', 'Y'));

ALTER TABLE SECTHOLES ADD CONSTRAINT CK_SECTHOLES_UPORDOWN
      CHECK (UPORDOWN IN ('U', 'D', '?'));

CREATE INDEX ORIGSITEID   ON SECTHOLES (ORIGNO,SITEID);
```

4.37 CONTACTS authority table data dictionary

Note: CONTACTS is the AGSO authority table of geological contact types for the INTERIZONS table.

```
CREATE TABLE CONTACTS (
      CONTACTID           NUMBER  (5)  NOT NULL,
      CONTACTNAME         VARCHAR2(32) NOT NULL );

ALTER TABLE CONTACTS ADD CONSTRAINT PK_CONTACTS PRIMARY KEY (CONTACTID);
```

4.38 IZ_RECTYPES authority table data dictionary

Note: IZ_RECTYPES is the authority table of record types for the INTERIZONS table.

```
CREATE TABLE IZ_RECTYPES (
      RECTYPE           VARCHAR2(3)  NOT NULL,
      RECNAME           VARCHAR2(16) NOT NULL,
      PHEADER           VARCHAR2(10),
      LHEADER           VARCHAR2(10),
      Q1HEADER          VARCHAR2(10),
      Q2HEADER          VARCHAR2(10),
      Q3HEADER          VARCHAR2(10),
      CHEADER           VARCHAR2(10),
      POINT             VARCHAR2(1),
      PCT_ENABLED       VARCHAR2(1) );

ALTER TABLE IZ_RECTYPES ADD CONSTRAINT PRIMARY KEY (RECTYPE);
```

4.39 INTERIZONS table data dictionary

Note: INTERIZONS is the table of interval descriptions for measured sections or drill holes.

```
CREATE TABLE INTERIZONS (
      IZ_NO             NUMBER   (6)          NOT NULL,
      SECTHOLENO        NUMBER   (5)          NOT NULL,
      RECTYPE           VARCHAR2 (3)          NOT NULL,
      D1                NUMBER   (6,2)        NOT NULL,
      D2                NUMBER   (6,2),
      PERCENT           NUMBER   (7,2),
      DETAIL_PTR        NUMBER   (7),
      DETAIL_PTR_CHR    VARCHAR2 (7),
      DETAIL_PTR_CHR2   VARCHAR2 (7),
      COMMENTS          VARCHAR2 (128),
      ENTEREDBY         VARCHAR2 (8),
      ENTRYDATE         DATE                  NOT NULL );

ALTER TABLE INTERIZONS ADD CONSTRAINT PK_INTERIZONS PRIMARY KEY (IZ_NO);

ALTER TABLE INTERIZONS ADD CONSTRAINT FK_INTERIZONS_SECTHOLENO
```

```
      FOREIGN KEY (SECTHOLENO) REFERENCES SECTHOLES (SECTHOLENO);

ALTER TABLE INTERIZONS ADD CONSTRAINT FK_INTERIZONS_RESTYPE
      FOREIGN KEY (RECTYPE) REFERENCES IZ_RECTYPES (RECTYPE);

ALTER TABLE INTERIZONS ADD CONSTRAINT FK_INTERIZONS_D1
      CHECK (D1 BETWEEN 0.0 AND 99999.9);

ALTER TABLE INTERIZONS ADD CONSTRAINT FK_INTERIZONS_D2
      CHECK (D2 BETWEEN 0.0 AND 99999.9);

CREATE       INDEX SECTHOLENOS ON INTERIZONS (SECTHOLENO);
```

4.40 METHODS authority table data dictionary

Note: METHODS is AGSO's authority table of analytical methods.

```
CREATE TABLE METHODS (
      METHODNO          NUMBER    (5)  NOT NULL,
      METHOD            VARCHAR2  (64) NOT NULL );

ALTER TABLE METHODS ADD CONSTRAINT PK_METHODS PRIMARY KEY (METHODNO);

ALTER TABLE METHODS ADD CONSTRAINT UK_METHODS_METHOD
      UNIQUE (METHOD);
```

4.41 RBSR_AGES table data dictionary

Note: RBSR_AGES is the pooled results table for the Rb-Sr method.

```
CREATE TABLE RBSR_AGES (
      RECNO             NUMBER    (8,2)     NOT NULL,
      AGE               NUMBER    (6,2),
      STD_DEVA          NUMBER    (6,2),
      INIT_RATIO        NUMBER    (7,6),
      STD_DEVI          NUMBER    (7,6),
      COMMENTS          VARCHAR2  (240),
      MSWD              NUMBER    (6,2),
      RELEASED          DATE,
      ENTEREDBY         VARCHAR2  (8),
      ENTRYDATE         DATE,
      LASTUPDATE        DATE,
      RESTRICTED        VARCHAR2  (1)       NOT NULL);

ALTER TABLE RBSR_AGES ADD CONSTRAINT PK_RBSR_AGES PRIMARY KEY (RECNO);
```

4.42 RB_SR table data dictionary

Note: RB_SR is the analytical data table for the Rb-Sr method

```
CREATE TABLE RB_SR (
      AGE_POINTER       NUMBER  (8,2)  NOT NULL,
      ANALNO            NUMBER  (6)    NOT NULL,
      ORDERNO           NUMBER  (2),
      ORIGNO            NUMBER  (5)    NOT NULL,
      SITEID            VARCHAR2(16)   NOT NULL,
      SAMPLEID          VARCHAR2(16)   NOT NULL,
      REFID             VARCHAR2(9),
      METHODNO          NUMBER  (6),
      MINERAL           VARCHAR2(16),
      RB_PPM            NUMBER  (9,4),
      SR_PPM            NUMBER  (9,4),
      RB87SR86          NUMBER  (10,5),
      SR87SR86          NUMBER  (10,5),
      COMMENTS          VARCHAR2(240),
      RELEASED          DATE,
      ENTEREDBY         VARCHAR2(8),
      ENTRYDATE         DATE,
      LASTUPDATE        DATE,
      RESTRICTED        VARCHAR2(1)    NOT NULL);
```

```
ALTER TABLE RB_SR ADD CONSTRAINT PK_RB_SR PRIMARY KEY (ANALNO);

ALTER TABLE RB_SR ADD CONSTRAINT FK_RB_SR_AGE_POINTER
      FOREIGN KEY (AGE_POINTER) REFERENCES RBSR_AGES (RECNO);

ALTER TABLE RB_SR ADD CONSTRAINT FK_RB_SR_ORIGNO_SAMPLEID FOREIGN KEY
      (ORIGNO, SAMPLEID) REFERENCES ROCKS (ORIGNO, SAMPLEID);

ALTER TABLE RB_SR ADD CONSTRAINT FK_RB_SR_REFID
      FOREIGN KEY (REFID) REFERENCES AGSOREFS (REFID);

ALTER TABLE RB_SR ADD CONSTRAINT FK_RB_SR_METHODNO
      FOREIGN KEY (METHODNO) REFERENCES METHOD (METHODNO);

CREATE        INDEX RBSRORIGSAMPS ON RB_SR ( AGE_POINTER );
CREATE        INDEX RBSRORIGSAMPS ON RB_SR ( ORIGNO,SAMPNO );
```

4.43 SMND_AGES table data dictionary

Note: SMND_AGES is the pooled results table for the Sm-Nd method

```
CREATE TABLE SMND_AGES (
      RECNO               NUMBER        (6)          NOT NULL,
      MSWD                NUMBER        (6,2),
      AGE                 NUMBER        (6,2),
      STD_DEVA            NUMBER        (6,2),
      INIT_RATIO          NUMBER        (7,6),
      STD_DEVI            NUMBER        (7,6),
      EPSILON             NUMBER        (4,1),
      STD_DEV2            NUMBER        (3,1),
      COMMENTS            VARCHAR2      (240),
      ENTEREDBY           VARCHAR2      (8),
      ENTRYDATE           DATE,
      LASTUPDATE          DATE,
      RELEASED            DATE,
      RESTRICTED          VARCHAR2      (1) );

ALTER TABLE SMND_AGES ADD CONSTRAINT PK_SMND_AGES PRIMARY KEY (RECNO);
```

4.44 SM_ND table data dictionary

Note: SM_ND is the analytical data table for the Sm-Nd method

```
CREATE TABLE SM_ND (
      AGE_POINTER         NUMBER        (6)    NOT NULL,
      ANALNO              NUMBER        (6)    NOT NULL,
      ORDERNO             NUMBER        (2)    NOT NULL,
      ORIGNO              NUMBER        (5)    NOT NULL,
      SITEID              VARCHAR2      (16),
      SAMPLEID            VARCHAR2      (16)   NOT NULL,
      GEOL_AGE            NUMBER        (6,2),
      EPSN_ND             NUMBER        (4,1),
      REFID               VARCHAR2      (9),
      METHODNO            NUMBER        (6),
      MINERAL             VARCHAR2      (16)
      SM_PPM              NUMBER        (8,4)
      ND_PPM              NUMBER        (9,4)
      SM147ND144          NUMBER        (8,5)
      ND143ND144          NUMBER        (9,6)
      TND                 NUMBER        (4)
      COMMENTS            VARCHAR2      (240)
      ENTEREDBY           VARCHAR2      (8)
      ENTRYDATE           DATE
      LASTUPDATE          DATE
      RELEASED            DATE
      SIGMA2X10_6         NUMBER        (2)
      RESTRICTED          VARCHAR2      (1));
```

```
ALTER TABLE SM_ND ADD CONSTRAINT PK_SM_ND PRIMARY KEY (ANALNO);

ALTER TABLE SM_ND ADD CONSTRAINT FK_SM_ND_AGE_POINTER
      FOREIGN KEY (AGE_POINTER)REFERENCES SMND_AGES (RECNO);

ALTER TABLE SM_ND ADD CONSTRAINT FK_SM_ND_ORIGNO
      FOREIGN KEY (ORIGNO) REFERENCES ORIGINATORS (ORIGNO);

ALTER TABLE SM_ND ADD CONSTRAINT FK_SM_ND_ORIGNO_SAMPLEID
      FOREIGN KEY (ORIGNO, SAMPLEID) REFERENCES ROCKS (ORIGNO, SAMPLEID);

ALTER TABLE SM_ND ADD CONSTRAINT FK_SM_ND_REFID
      FOREIGN KEY (REFID) REFERENCES AGSOREFS (REFID);

ALTER TABLE SM_ND ADD CONSTRAINT FK_SM_ND_METHODNO
      FOREIGN KEY (METHODNO) REFERENCES METHODS (METHODNO);

CREATE        INDEX SMNDAGEPOINTS ON SM_ND ( AGE_POINTER );
CREATE        INDEX SMNDORIGSAMPS ON SM_ND (ORIGNO, SAMPNO );
```

4.45 UPB_AGES table data dictionary

Note: UPB_AGES is the analytical data table for the U-Pb whole mineral method.

```
CREATE TABLE UPB_AGES (
      RECNO              NUMBER       (6)          NOT NULL,
      AGE                NUMBER       (6,2),
      STD_DEVA           NUMBER       (6,2),
      LI_AGE             NUMBER       (6,2),
      STD_DEVI           NUMBER       (6,2),
      COMMENTS           VARCHAR2     (240),
      MSWD               NUMBER       (6,2),
      ENTEREDBY          VARCHAR2     (8),
      ENTRYDATE          DATE,
      LASTUPDATE         DATE,
      RELEASED           DATE,
      RESTRICTED         VARCHAR2     (1)          NOT NULL);

ALTER TABLE UPB_AGES ADD CONSTRAINT PK_UPB_AGES PRIMARY KEY (RECNO);
```

4.46 U_PB table data dictionary

Note: U_PB is the analytical data table for the U-Pb whole mineral method

```
CREATE TABLE U_PB (
      RECNO          NUMBER       (5)     NOT NULL,
      ANALNO         NUMBER       (6)     NOT NULL,
      ORIGNO         NUMBER       (5)     NOT NULL,
      SITEID         VARCHAR2     (16)    NOT NULL,
      SAMPLEID       VARCHAR2     (16)    NOT NULL,
      ORDERNO        NUMBER       (3),
      FRACTION       VARCHAR2     (16)
      REFID          VARCHAR2     (9),
      METHODNO       NUMBER       (6),
      WEIGHT         NUMBER       (6,4),
      U_PPM          NUMBER       (8,2),
      PB_PPM         NUMBER       (8,2),
      PBRAD_PPM      NUMBER       (8,2),
      PB206PB204     NUMBER       (8,2),
      PB206RAD       NUMBER       (8,2),
      PB207RAD       NUMBER       (8,2),
      PB208RAD       NUMBER       (6,2),
      PB207PB206     NUMBER       (6,5),
      PB206U238      NUMBER       (6,5),
      PB207U235      NUMBER       (7,5),
      MIN76_AGE      NUMBER       (4),
      STD_DEV1       NUMBER       (3),
      APP206_238     NUMBER       (4),
      STD_DEV2       NUMBER       (3),
      APP207_235     NUMBER       (4),
```

```
      STD_DEV3      NUMBER        (3),
      APP208_232    NUMBER        (4),
      STD_DEV4      NUMBER        (3),
      COMMENTS      VARCHAR2      (240),
      ENTEREDBY     VARCHAR2      (8),
      ENTRYDATE     DATE,
      LASTUPDATE    DATE,
      RELEASED      DATE,
      RESTRICTED    VARCHAR2(1)         NOT NULL);

ALTER TABLE U_PB ADD CONSTRAINT PK_U_PB PRIMARY KEY (ANALNO);

ALTER TABLE U_PB ADD CONSTRAINT FK_U_PB_RECNO
      FOREIGN KEY (RECNO) REFERENCES UPB_AGES (RECNO);

ALTER TABLE U_PB ADD CONSTRAINT FK_U_PB_ORIGNO
      FOREIGN KEY (ORIGNO) REFERENCES ORIGINATORS (ORIGNO);

ALTER TABLE U_PB ADD CONSTRAINT FK_U_PB_ORIGNO_SAMPLEID
      FOREIGN KEY (ORIGNO, SAMPLEID) REFERENCES ROCKS (ORIGNO, SAMPLEID);

ALTER TABLE U_PB ADD CONSTRAINT FK_U_PB_REFID
      FOREIGN KEY (REFID) REFERENCES AGSOREFS (REFID);

ALTER TABLE U_PB ADD CONSTRAINT FK_U_PB_METHODNO
      FOREIGN KEY (METHODNO) REFERENCES METHODS (METHODNO);

CREATE       INDEX UPBORIGSAMPS ON U_PB ( ORIGNO, SAMPNO );
```

4.47 MEAN_METHOD authority table data dictionary

Note: the MEAN_METHOD authority table is for the methods used to calculate mean of isotope measurements for eack analysis.

```
CREATE TABLE MEAN_METHOD (
      METHODNO      NUMBER        (1)    NOT NULL,
      METHOD        VARCHAR2      (124)  NOT NULL);

ALTER TABLE MEAN_METHOD ADD CONSTRAINT PK_MEAN_METHOD PRIMARY KEY (METHODNO);
```

4.48 COMMON_PB authority table data dictionary

Note: the COMMON_PB authority table is for the lead isotope used to correct SHRIMP U-Pb age determinations for non-radiogenic lead.

```
CREATE TABLE COMMON_PB (
      PB_CODE       NUMBER        (1)    NOT NULL,
      COMMON_PB     VARCHAR2      (12)   NOT NULL);

ALTER TABLE COMMON_PB ADD CONSTRAINT PK_COMMON_PB PRIMARY KEY (PB_CODE);
```

4.49 AGE_USED authority table data dictionary

Note: the AGE_USED authority table is for the isotope ratios that can be used for determining an age.

```
CREATE TABLE AGE_USED (
      AGE_CODE      NUMBER        (1)    NOT NULL,
      AGE_USED      VARCHAR2      (8)    NOT NULL);

ALTER TABLE AGE_USED ADD CONSTRAINT PK_AGE_USED PRIMARY KEY (AGE_CODE);
```

4.50 SHRIMP_AGES table data dictionary

Note: SHRIMP_AGES is the pooled results table for the U-Pb Shrimp method.

```
CREATE TABLE SHRIMP_AGES (
       RECNO          NUMBER       (6)     NOT NULL,
       ORIGNO         NUMBER       (5)     NOT NULL,
       SITEID         VARCHAR2     (16)    NOT NULL,
       SAMPLEID       VARCHAR2     (16)    NOT NULL,
       AGE            NUMBER       (6,2),
       STD_DEVA       NUMBER       (6,2),
       LI_AGE         NUMBER       (6,2),
       STD_DEVI       NUMBER       (6,2),
       COMMENTS       VARCHAR2     (240),
       METHOD         NUMBER       (1),
       COMMON_PB      NUMBER       (1),
       AGE_USED       NUMBER       (1),
       ENTEREDBY      VARCHAR2     (8),
       ENTRYDATE      DATE,
       LASTUPDATE     DATE,
       RELEASED       DATE,
       RESTRICTED     VARCHAR2     (1)     NOT NULL);

ALTER TABLE SHRIMP_AGES ADD CONSTRAINT PK_SHRIMP_AGES (RECNO);

ALTER TABLE SHRIMP_AGES ADD CONSTRAINT FK_SHRIMP_AGES_METHOD
       FOREIGN KEY (METHOD) REFERENCES MEAN_METHOD (METHODNO);

ALTER TABLE SHRIMP_AGES ADD CONSTRAINT FK_SHRIMP_AGES_COMMON_PB
       FOREIGN KEY (COMMON_PB) REFERENCES COMMON_PB (PB_CODE);

ALTER TABLE SHRIMP_AGES ADD CONSTRAINT FK_SHRIMP_AGES_AGE_USED
       FOREIGN KEY (AGE_USED) REFERENCES AGE_USED (AGE_CODE);

ALTER TABLE SHRIMP_AGES ADD CONSTRAINT FK_SHRIMP_AGES_ORIGNO
       FOREIGN KEY (ORIGNO) REFERENCES ORIGINATORS (ORIGNO);

ALTER TABLE SHRIMP_AGES ADD CONSTRAINT FK_SHRIMP_AGES_ORIGNO_SAMPLEID
       FOREIGN KEY (ORIGNO, SAMPLEID) REFERENCES ROCKS (ORIGNO, SAMPLEID);

CREATE         INDEX SHRIMPAGEORIGSAMPS ON SHRIMP_AGES ( ORIGNO, SAMPLEID );
```

4.51 SHRIMP table data dictionary

Note: SHRIMP is the analytical data table for the U-Pb shrimp method

```
CREATE TABLE SHRIMP (
       RECNO           NUMBER       (6)     NOT NULL,
       ANALNO           NUMBER      (6)     NOT NULL,
       LABNO           VARCHAR2     (16)
       GRAINO          VARCHAR2     (16)
       SPOTNO          VARCHAR2     (16)
       ORDERNO         NUMBER       (3),
       REFID           VARCHAR2     (9),
       WEIGHT          NUMBER       (5,3),
       U_PPM           NUMBER       (7,2),
       TH_PPM          NUMBER       (7,2),
       TH_OVER_U       NUMBER       (6,3),
       PB204_PPB       NUMBER       (9,2),
       PB206PB204      NUMBER       (8,1),
       F_PCT           NUMBER       (6,3),
       PB207PB206      NUMBER       (6,5),
       STD_DEV1        NUMBER       (6,5),
       PB208PB206      NUMBER       (6,5),
       STD_DEV2        NUMBER       (4,4),
       PB206U238RAD    NUMBER       (6,5),
       STD_DEV3        NUMBER       (6,5),
       PB207U235RAD    NUMBER       (5,3),
       STD_DEV4        NUMBER       (5,3),
       PB208TH232RAD   NUMBER       (5,4),
       STD_DEV5        NUMBER       (5,4),
       MIN76_AGE       NUMBER       (4),
       STD_DEV6        NUMBER       (3),
       AGE206_238      NUMBER       (4),
       STD_DEV7        NUMBER       (3),
```

```
      AGE207_235      NUMBER      (4),
      AGE208_232      NUMBER      (4),
      COMMENTS        VARCHAR2    (240),
      ENTEREDBY       VARCHAR2    (8),
      ENTRYDATE       DATE,
      LASTUPDATE      DATE,
      RELEASED        DATE,
      RESTRICTED      VARCHAR2    (1)    NOT NULL);

ALTER TABLE SHRIMP ADD CONSTRAINT PK_SHRIMP PRIMARY KEY (ANALNO);

ALTER TABLE SHRIMP_AGES ADD CONSTRAINT FK_SHRIMP_RECNO
      FOREIGN KEY (RECNO) REFERENCES SHRIMP_AGES (RECNO);

ALTER TABLE SHRIMP_AGES ADD CONSTRAINT FK_SHRIMP_REFID
      FOREIGN KEY (REFID) REFERENCES AGSOREFS (REFID);

CREATE        INDEX SHRIMPRECPTRS   ON SHRIMP ( RECNO );
```

4.52 MAXNOS table data dictionary

```
CREATE TABLE MAXNOS (
      IDMAXNO         VARCHAR2(16)       NOT NULL,
      MAXNO           NUMBER  (6)        NOT NULL);

ALTER TABLE SHRIMP_AGES ADD CONSTRAINT PK_MAXNOS PRIMARY KEY IDMAXNO;
```

Section 5—Ozchron data set - Release 2.0

This OZCHRON release contains geochronological data derived from different isotopic systems from Australian Archaean, Proterozoic and Palaeozoic provinces. This data lists 1317 age determinations. These consist of 358 new SHRIMP (ion microprobe) U-Pb ages, 376 new Sm-Nd ages, and 395 Rb-Sr ages, 135 U-Pb conventional ages and 53 SHRIMP U-Pb ages previously released in Version 1 of OZCHRON. Table 5.1 lists all the ages by province. Figures 5.1, 5.2, 5.3 and 5.4 show the distribution of sites at which the samples for these age determinations have been collected.

The data base, as it has been developed so far, has not endeavoured to cover all analytical techniques. This new data set principally contains additional U-Pb results by SHRIMP ion probe methods, and Sm - Nd data.

All of the reported conventional U-Pb and Rb-Sr results define Proterozoic ages, but it is now recognised that most Rb-Sr ages in early to middle Proterozoic terranes reflect metamorphic overprinting or alteration. However in some cases they may very relevant to dating metamorphism and alteration events.

All results are normalised to decay constants recommended by the IUGS Subcommission on Geochronology (Steiger and Jäger, 1977; Subcommission on Geochronology: Convention on the use of decay constants in geo- and cosmology. Earth and Planetary Science Letters, 36: 359-362).

Table 5.1 List of samples from Australian geological provinces in OZCHRON.

DATA SET	PROVINCE	SHRIMP	Sm-Nd	Rb-Sr	U-Pb
North Queensland	Cape York Plutonic Belt	15	39	1	
	Coen Block	13	13		
	Drummond Basin	2	1		
	Georgetown Block	17	12	40	6
	North Queensland Igneous Province	15	13		
	Yambo Block	5	3		
Mount Isa Inlier	Mount Isa Inlier	50	30	73	48
Pine Creek Geosyncline	Pine Creek Geosyncline	34		50	25
Lachlan Fold Belt	Lachlan Fold Belt	34	55		
	Dundas Trough	4			
	Rocky Cape Block	10			
	Tyenna Block	2			
South Australian Proterozoic	Stuart Shelf			8	7
	Adelaide Fold Belt			1	
	Gawler Craton			79	9
	Musgrave Block				
	Denison Block			3	1
	Curnamona Craton				1
Western Australian Proterozoic	Albany-Fraser	6	6	10	3
	Bangemall Basin	1		1	
	Fitzroy Lamporites		25		
	Gascoyne Province			6	
	Granites-Tanami Block	11	10	5	
	Halls Creek Province	48	18	5	3
	Kimberley Basin	2		2	
	Paterson Province			6	
	Murchison Province	3			
	Northhampton Block			2	
Musgrave Block	Musgrave Block	11	50	19	
McArthur Basin	McArthur Basin	27		6	3
	Arnhem Block	5		1	
	Murphy Inlier			1	
	South Nicholson Basin			1	
Arunta Block	Arunta Block	26	68	38	13
	Amadeus Basin			2	
Tennant Creek Block	Tennant Creek Block	28	5	22	4
	Davenport Geosyncline	9		1	2
	Birrindudu Basin			1	
Yilgarn Craton	Yilgarn Craton	28			
Pilbara Block	Pilbara Block		28		
Broken Hill Block	Broken Hill Block	5			3
	Willyama Block			10	7
		411	376	395	135

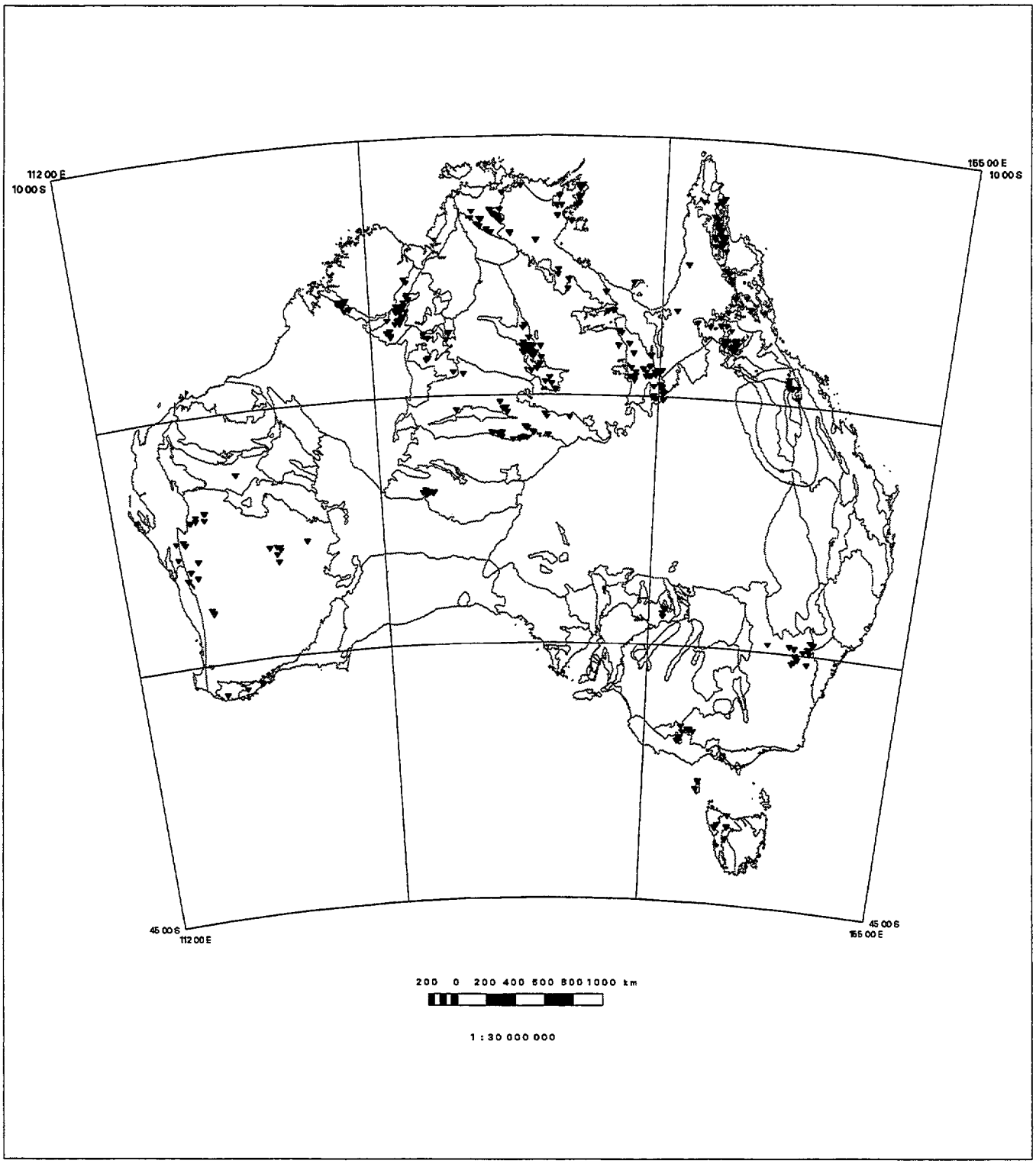

Figure 5.1 Distribution of the Australian Shrimp Data Set

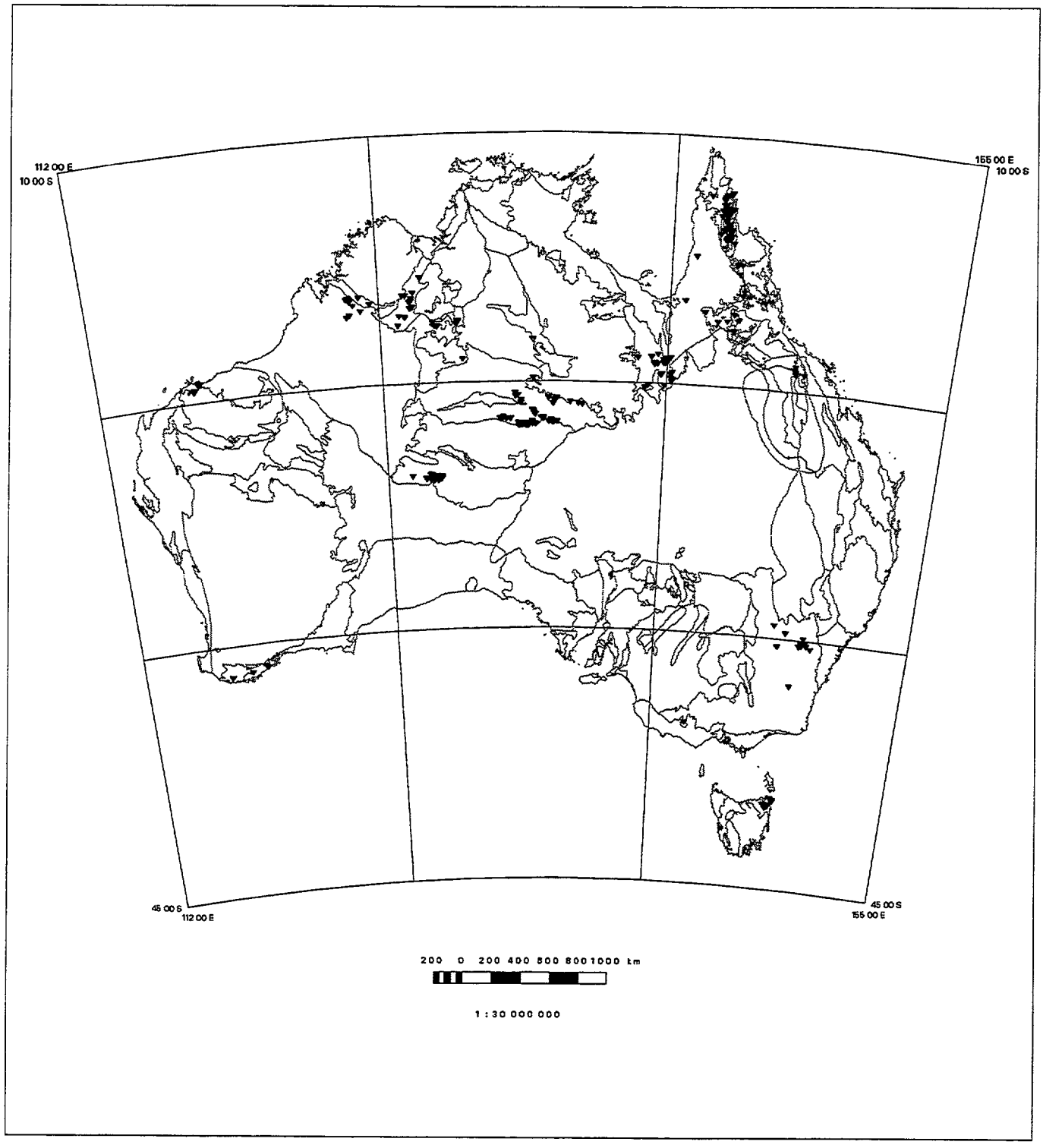

Figure 5.2 Distribution of the Australian Sm_Nd Data Set

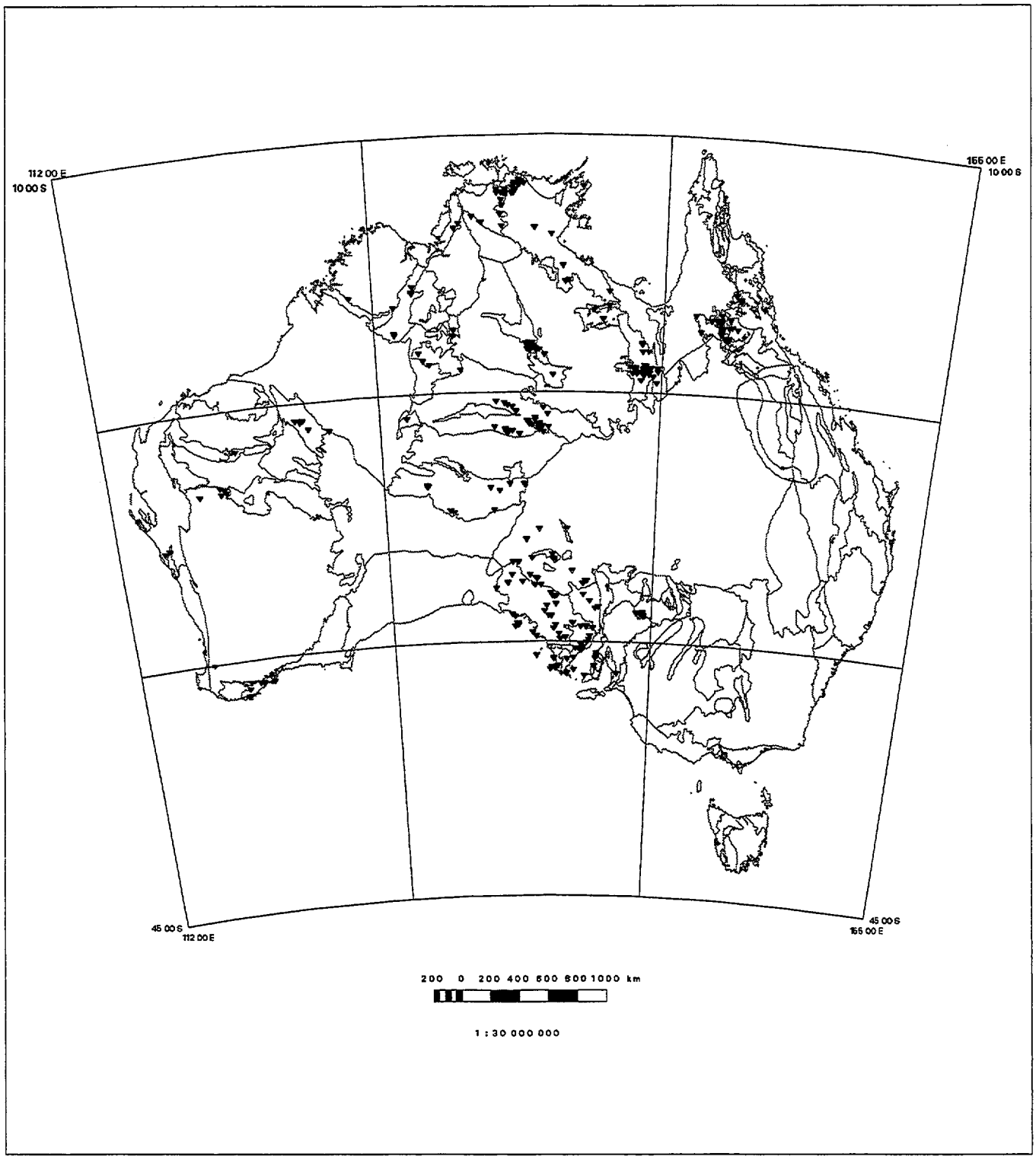

Figure 5.3 Distribution of the Australian Rb_Sr Data Set

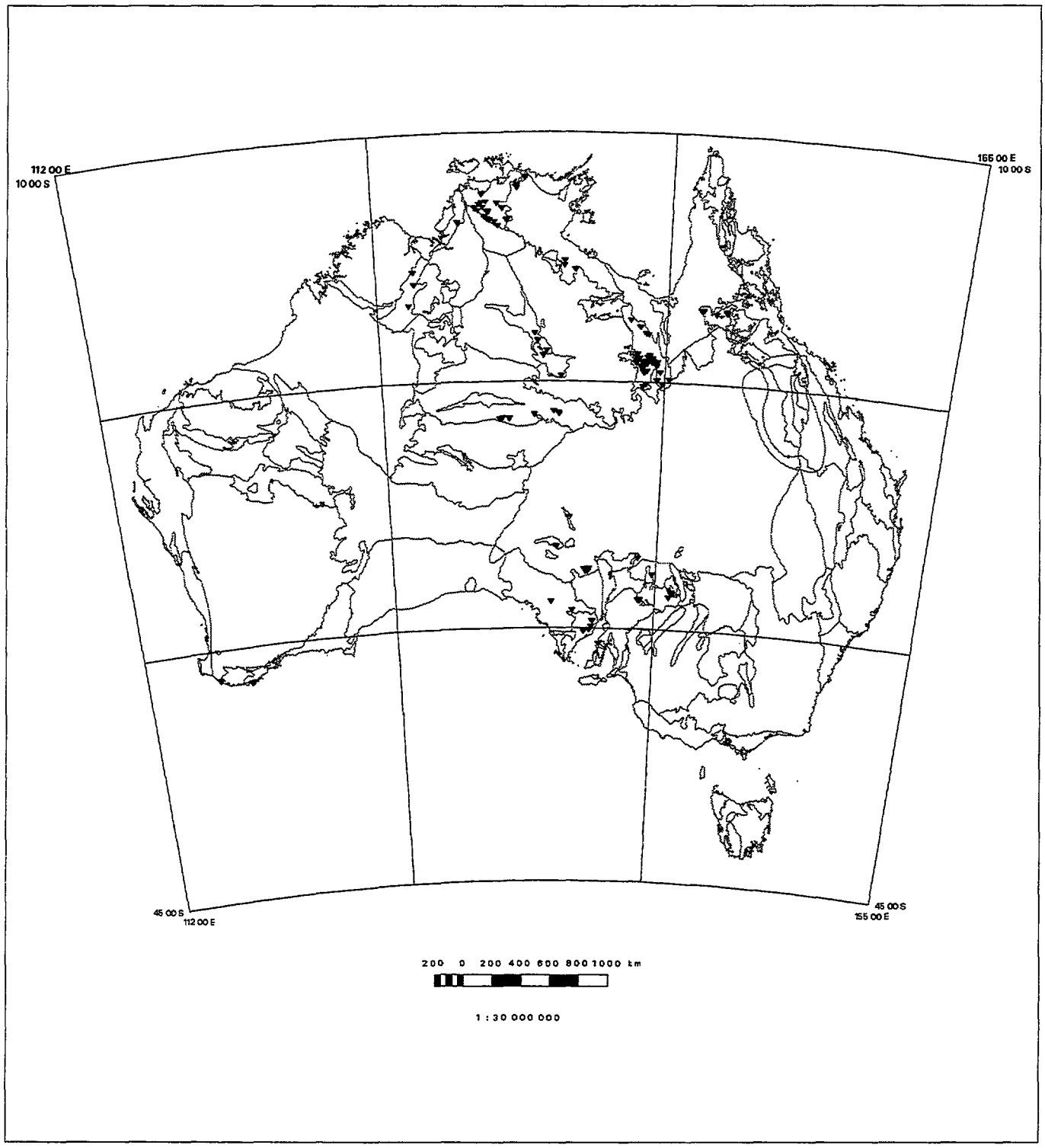

Figure 5.4 Distribution of the Australian U_Pb Data Set